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**Digital destination promotion: understanding and maximizing
the use of digital and cultural assets to enhance tourists'
decision making and destination marketing strategies**

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Sunderland for the degree of PhD by Existing Published or Creative Work.

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This section was supposed to be short, being grateful for the most important people who supported me through this process. Lynne (Hall) my supervisor, who took this on with the perspective of a short journey. I am sorry that I managed to throw every disruptive event possible into this PhD process. Although I am not regretting the birth of my little boy I really could have done without breaking my leg. Thank you for your patience and life advice throughout. Finally we can now embark on all those interesting projects we have touched on in-between writing this piece of work. I couldn't have done it without you.

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But reflecting on whom to thank made me realise that so many people touched this work, the way how I approach it, and the areas I am researching, that I could not leave it without saying thank you.

Many years ago, as a little girl, I would sit on our balcony at home and classify tourists from where they came from on the basis of their car registration plates. There was little else to do on a Saturday morning in my Austrian hometown and tourists blocking the only road through the town in their cars were something of a spectacle and inspiration. I wonder if faith is sometimes predetermined.

My road with research started through studying Statistics at Vienna University, encouraged and supported by my parents to study whatever I wanted. Whilst in Vienna, I also worked part time for the Institute for Public Health at the University of Vienna where I became well acquainted with medical statistics. It was during this time that I quickly realised how important accuracy and confidence are in your data and analysis; they are a vitally important basis for research and they underpin the ability to make trustworthy results accessible to all. I have never met anyone who was able to interpret data for people to understand and use it as Prof Kunze did at this time. His and all my colleagues love for applied research were infectious, so it is probably no surprise that both myself and my statistical colleague and partner in crime at that time both ended up in academia.

My path into tourism research truly started when I became a research and teaching assistant at the Institute of Tourism and Leisure at the Vienna University of Economics and Business Administration. The department's strong grounding in statistics linked very well with my interest of computing. The most inspirational people in eTourism were meeting there, dreaming, creating and testing; Charly (Karl Woeber) and Dan (Fesenmaier) whose endless discussions were inspiring. Where one made me question, the other made me focus. This time inspired some of my early research, and created a grounding in eTourism and the topics which I still love. The time working with Prof Mazanec, whose strict research ethos will never leave me, my wonderful colleagues at that time Margit, Ulli, Ulli, Sarah, Andy, Klaus and Didi who made those discussion and work so much more fun, and the great friends I made in the states with Ulli and Yeong, have and continue to inspire me.

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What a wonderful journey it has been so far, what a wonderful journey there is to come.

Abstract

With the overarching research question “*how Information and Communication Technologies can be used to support a destination in improving tourists’ information search and decision making through the use of its digital and cultural assets*” this thesis connects the three themes of eTourism, destination marketing and heritage tourism through a user-centric approach and the application of innovative technologies. The eight papers provided utilise and investigate the application of technology to improve the effectiveness and promotion of destination marketing and destination marketing organisations whilst, at the same time, improving user experiences.

Interdisciplinary research focuses on the opportunities provided by digital and cultural assets of destinations to enhance destination marketing efforts. This research recognises and discusses the importance and challenges of the commodification process of tangible and intangible heritage as part of the marketing process. Methodologies appropriate to each of the research purposes were applied and data was triangulated to improve understanding. Quantitative data was collected through questionnaires, web crawlers and log files enabling the research to draw on analytical methods such as correspondence and cluster analysis, as well as data envelopment analysis (DEA). Qualitative methods such as workshop cycles, observations, and interviews were used to provide rich narratives analysed through content analysis.

The results from the eight papers enhance destination marketing efforts by providing a better understanding of user behaviour and preferences based on travel personalities, travel and search pattern. They provide a clearer representation of the technologies, digital assets and e-Services available, discussing web site content and effectiveness. Strategies and innovative ideas to improve the current utilisation of digital technologies are provided based on the outcomes of the studies presented. Furthermore, a reflection on the use of intangible cultural heritage assets within destination marketing supported through the use of technologies is explored to enhance opportunities for destination marketing.

The research presents innovative and new ways to a destination to create new meanings and unique selling points (USPs) through cultural heritage assets and user-centric technologies. It introduces an interpretative strategy within destination marketing, and ideas to make the tourists' holiday choice process more engaging. It enhances the understanding of on-line destination presentation, enabling comparisons between providers and improving their competitiveness.

The main contribution of this work is new and enhanced insights how to improve on-line destination presentation by understanding its current representation and users' search and behaviour patterns online and during travelling. It provides examples for the usefulness of ICT and cultural heritage in order to improve destinations' marketing efforts. It also adds to the debate of the application of technologies for heritage interpretation and the commodification of (local) cultural heritage assets for destination marketing and tourism purposes.

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1 Introduction

*Technology does not only enable, but also induces change
(Werthner and Klein, 1999)*

The research presented within this PhD by existing published work signifies the researcher's journey. It connects the research themes of eTourism, destination marketing and heritage tourism. The research papers presented are underpinned by at least one combination of two research areas, if not all three. Furthermore, literature used in the research papers expands interdisciplinary research into the areas of computing, heritage, and business studies.

The focus of this work is supporting tourists' information search and decision making processes whilst also supporting destinations to communicate their unique selling points (USPs) through the application of innovative technologies and heritage.

Technology opened a more global and mobile world (Hannam et al., 2014) creating in its midst look-a-like and feel-a-like destinations (Prentice, 2006). The information overflow makes it difficult for prospective tourists to find relevant and reliable sources (Choi et al., 2007; Mitsche, 2005, 2001; Pan, 2015). Destination management organisations (DMOs) have difficulty in maintaining their visibility on the Internet and in particular on search engines competing with other web sites offering destination relevant services (Bauernfeind and Mitsche, 2008; Gretzel et al., 2015; Mitsche, 2005). The research investigates opportunities for DMOs to improve their engagement with prospective tourists.

Cultural heritage and, more particularly, local cultural heritage assets and their narratives, have been identified to facilitate the creation of new unique selling points for destinations (Mitsche et al., 2013). This identifies a need for DMOs and their stakeholders to understand in greater depth how they can use those changes and opportunities to their advantage (Mariani et al., 2014; Prentice, 2006). Technologies (Buhalis, 2000) and cultural heritage (Apostolakis, 2003; Ashworth et al., 2007; Mariani et al., 2014; Prentice, 2006) are perceived as opportunities for destination marketing. In particular

intangible heritage assets and unexplored stories provide a unique opportunity for commodification for destination marketing purposes, but also to the benefit of its conservation and accessibility (Mitsche et al., 2013).

As such, in this context, the overarching research question of this work is:

How can Information and Communication Technologies be used to support a destination in improving tourists' information search and decision making through the use of its digital and cultural assets?

The research question is explored in terms of the following objectives, with each objective met through the related papers:

1. To evaluate the potential for targeted online destination marketing through travel recommendation systems

- Gretzel U., Mitsche, N., Hwang, Y.-H., Fesenmaier, D. (2004) 'Tell me who you are and I will tell you where to go – Use of travel personalities in destination recommendation systems', *Journal of Information Technologies and Tourism* 7(2). 3-12.
- Mitsche, N. (2002) 'Conceptualization of a Global Trip Planning Recommender System for Tourism Recommender Systems' in: Wöber, K. W., Frew, A. J., Hitz, M. (eds.) *Information and Communication Technologies in Tourism 2002*, Springer Vienna. 366-374.
- Mitsche, N. (2001) 'Personalised Travel Counselling Systems: Providing Decision Support Features for Travellers' in: Sheldon, P., Wöber, K., Fesenmaier, D. (eds.): *Information and Communication Technologies in Tourism 2001*, Springer, Vienna. 160-166.

2. To investigate different search patterns, strategies and keywords within the online search process in the destination context

- Mitsche, N. (2005) 'Understanding the Information Search Process within a Tourism Domain-specific Search Engine', in: Frew, A. (2005) *Information Technologies in Tourism 2005*, Springer Vienna. 183-193.

3. To assess Web site efficiency of destination organisations

- Bauernfeind, U. and Mitsche, N. (2008) 'The Application of the Data Envelopment Analysis for Tourism Website Evaluation', *Journal of Information Technology and Tourism*, 10(3). 245-258.

4. To investigate the digitisation status and use of e-Services in delivering heritage interpretation to improve interpretation and marketing

- Mitsche, N. and Bauernfeind, U. (2008) The use of technology for cultural heritage interpretation – examples from three cities. *ATLAS Conference: Selling or Telling? Paradoxes in Tourism, Culture and Heritage*, Brighton 2-4 July 2008.
- Mitsche, N., Reino, S., Knox, D., Bauernfeind, U. (2008) 'Enhancing cultural tourism e-services through heritage interpretation', in O'Connor, P., Höpken, W., Gretzel, U. (eds.) *Information and Communication Technologies in Tourism 2008*, Springer Vienna. 418-429.

5. To improve the use of intangible (and tangible) cultural heritage assets in destination marketing

- Mitsche, N., Vogt, F., Knox, D., Cooper, I., Lombardi, P., Ciaffi, D., (2013) 'Intangibles - enhancing access to cities' cultural heritage through interpretation', *International Journal of Culture, Tourism and Hospitality Research*, 7(1). 68-77.

Early papers presented discuss findings from an evaluative framework perspective such as the potential of categorising travel web sites by users for the purpose of travel recommendation systems (Mitsche 2001, 2002).

The work then moved into the direction of improving the understanding of online users for destinations marketing purposes. An analysis of visitors analysed their ability of self-categorisation to enable destinations to improve their targeted online marketing and develop easy to use travel recommendation systems (Gretzel et al 2004). Similarly, in relation to improving targeted destination marketing, work also focused on investigating, identifying and understanding online search patterns, strategies and

keywords of users during their search on a destination portal (Mitsche 2005). The work also reflected on the readiness of destination web sites in comparison to their competitors, and looked at improvement potentials and benchmarking partners (Bauernfeind and Mitsche 2008).

The work presented also included the potential of cultural heritage and, more particularly, the potential of intangible assets for destination marketing to provide unique selling points (USPs) in the increased competitive market of look-a-like and feel-a-like destinations. Technology offers an access point and tools to promote those digital tangible and intangible assets, thus improving destination marketing strategies and keeping destinations competitive. Work in this context initially evaluated the current digitisation status of destination and cultural heritage providers, and investigated the potential use of eServices to deliver heritage interpretation in the destination context (Mitsche et al 2008a, 2008b). It continued to work with destinations to improve their destination marketing strategies by utilising heritage interpretation methods to improve the destinations' USPs (Mitsche 2013).

1.1 Thesis Structure

The thesis is structured in eleven chapters which are outlined in detailed below. The overall structure is based on an introduction to the work presented. It continues to provide an updated context in the areas of eTourism, destination marketing and heritage tourism, including the current debates. The methodology links together the philosophical and methodological journey. The research papers are discussed in their updated context and contribution to knowledge through objectives. A reflection on innovation and contribution, and an overall conclusion, completes the piece of work

Chapter 1 comprises an introduction to the research, an overview of the overarching research question and its specific research objective interrelated with the papers presented in this thesis. It also provides a short overview of each of the chapters and its unique structure.

Chapter 2 provides an up to date literature review in the interconnected themes of eTourism, destination marketing and heritage tourism. It explores how technology has influenced and changed tourism substantially from its original service and product focus to a consumer focused quality experience (Buhalis and Law, 2008; Sørensen and Jensen, 2015) and the current debates on social media and co-creation (Greg, 2016; Lyu, 2016; Mkono and Tribe, 2016; Munar and Jacobsen, 2014), and gamification (Egger and Bulencea, 2015; Jung et al., 2016; Xu et al., 2013). It discusses the challenges of destination marketing and competitiveness for DMOs (Mariani et al., 2014; Prentice, 2006; Ritchie and Crouch, 2000) and the current debates on the experience economy and smart tourism (Gretzel et al., 2015; Harrigan et al., 2017; Li et al., n.d.; Mei, 2014) in a section on destination marketing. A section on heritage tourism reflects on the interconnectivity of heritage tourism with destination marketing (Ashworth et al., 2007; Timothy, 2011) and opens up the opportunities provided by intangible heritage assets (Prentice, 2006), and the application of heritage interpretation (Mitsche et al., 2013). It expands to the current debates on heritage-of-performance and new digital technologies for destination marketing (Guttentag, n.d.; Haldrup and Bøerenholdt, 2015; Jung and Han, 2014).

Chapter 3 reflects on the research journey. It examines the philosophical debates of my research journey incorporating interdisciplinary research and the current debates in tourism (Ateljevic et al., 2007). It also provides an overview and contextualisation of the methods used, embracing quantitative, qualitative and mixed method approaches. A self-reflection links my philosophical and methodological research journey with the research papers. Furthermore, it reflects on the research journey providing a narrative of research outcomes and identified gaps to link with the papers presented.

Chapter 4 to 8 discuss the research papers set into the context of the five main research objectives of this thesis. Each of these chapters is structured in the same way. Firstly, discussing the research papers by providing an updated discussion on the *background and innovation* of the research themes. It then further examines *methodologies* applied and their limitations.

The main *findings and contribution* of the research are elaborated upon, and *a summary is elaborated in response to the objectives*. The final part of each chapter is a copy of the research paper(s). The five chapters are:

Chapter 4, “To evaluate the potential for targeted online destination marketing through travel recommendation systems”, reflects on the opportunities of travel personalities and fun elements for destination recommendation systems in the tourist’s decision making process, and contextualises the development of recommendation systems.

Chapter 5, “To investigate different search patterns, strategies and keywords within the online search process in the destination context”, discusses the tourism search and decision making process, and provides insights into the specific behaviour of prospective tourists’ while they are searching online.

Chapter 6, “To assess Web site efficiency of destination organisations”, highlights the importance of benchmarking for destinations. It provides insights into the opportunities for destination marketing online through the identification of benchmarking partners, and improvement potentials by the quantitative benchmarking method data envelopment analysis (DEA).

Chapter 7, “To investigate the digitisation status and use of e-Services in delivering heritage interpretation to improve interpretation and marketing”, presents a research framework to evaluate the digitisation status of cities utilising heritage interpretation. It further elaborates on some of the practical implications which were utilised within the final ISAAC (Integrated e-Services for Advanced Access to Heritage in Cultural Tourist Destinations) prototype (ISAAC EU Project, 2008).

Chapter 8, “To improve the use of intangible (and tangible) cultural heritage assets in destination marketing”, provides an overview of innovative research applying a heritage interpretation strategy in the destination context. Using the case studies of the three ISAAC cities, namely Amsterdam, Genoa and Leipzig, a cooperative approach of integrating a unique stakeholder mix (destination management, cultural heritage attractions, citizen/heritage

communities) was applied, and provided the cities with new hidden stories to be told to improve their uniqueness and competitiveness.

Chapter 9 discusses the innovation, contribution to knowledge, and impact within its discipline and beyond, for each of the overall research questions and each of the objectives.

Chapter 10, “Conclusions”, provides an overall reflection on work presented and discusses future directions.

Chapter 11 contains a list of references used in this commentary.

The Appendix (*Chapter 0*) provides a copy of the collaboration statements of co-authored work.

2 Literature Review

This chapter provides an overview of the three interconnecting themes of eTourism, destination marketing and heritage tourism. Each of the sections outlines relevant developments which have informed the research presented, and also discusses current debates in the respective fields.



Figure 1: Interdisciplinary research disciplines

eTourism emerged as its own research field within tourism over the last two decades exploring the areas where technologies continue to impact on travel and tourism (Buhalis, 2003; Buhalis and Law, 2008; Wang et al., 2010; Werthner and Klein, 1999). The section within this literature updates on the changes which technologies have brought, and are continuing to bring to tourism, from both a stakeholder and a consumer perspective.

All research papers presented are set within the eTourism context, but overlap with research areas in destination marketing and heritage tourism. They are grounded in the trend towards a more general inclusive approach and, as such, understand eTourism to be where technology and its application meets tourism in its varied forms from an organisation and consumer perspective.

The section on *destination marketing* is focused on marketing aspects in the destination context with a particular reference to the role of the destination within the tourism decision making process and their ability to market

themselves and communicate successfully with their (prospective) visitors. As most tourism activities are taking place at destinations, they are a fundamental part of tourism analysis (Pike, 2009). As such, themes which support destination management organisations (DMOs) in their efforts to increase their competitiveness overall and individually, as well improving their unique selling points creating distinguishable and not look-alike and feel-alike destinations (Prentice, 2006), are discussed.

The third section outlines the development of *heritage tourism*, its selective nature throughout the centuries and past decades up to our current choices (Timothy, 2011). A particular focus is given on the commodification of cultural heritage which has always played an important role in destination marketing (Alexander and Hamilton, 2016; Ashworth et al., 2007), and the tourist's destination choice. With an increased interest in heritage for tourism purposes (Prentice and Duncan, 1994) places are recognising the opportunities which intangible and tangible heritage assets can bring to improve their marketing strategies, but also to support conservation and accessibility to those assets (Hannam and Knox, 2010).

Themes currently emerging include the utilisation of local community heritage for commodification purposes (Alexander and Hamilton, 2016; Apostolakis, 2003; Ashworth et al., 2007; Mitsche et al., 2013) and a perspective of heritage-as-performance rather than heritage-of-things (Haldrup and Bøerenholdt, 2015; Haldrup and Larsen, 2009).

2.1 eTourism

Technology and, more particularly, the Internet have had a major impact and substantially transformed tourism, not only impacting internally in operational management and the product creation process but also in tourism organisations' engagement with the external world.

	Technology 1970-1990	Communication 2000-2010	Technology 2010-2015	Communication 2010-2015	Technology 2016 onwards	Communication 2016 onwards
Technological developments and applications	<ul style="list-style-type: none"> • Computer reservation Systems (CRS) 1970 • Global Distribution Systems (GDS) 1980 • Internet 1990 	<ul style="list-style-type: none"> • Search engines 2000 • Web design, usability and functionality • Decision support systems • Email 	<ul style="list-style-type: none"> • Mobile phones/Smart phones • Wireless Internet GPS/location based services 	<ul style="list-style-type: none"> • Travel reviews • Social media • User generated content (UGC) 	<ul style="list-style-type: none"> • Easy accessible wireless networks • 4G technology 	<ul style="list-style-type: none"> • Technology integration • UGC accessible technology • Gamification • Augmented reality applications
Changes to tourism	<ul style="list-style-type: none"> • Operational efficiency • Greater global distribution • Strategic changes in product distribution 	<ul style="list-style-type: none"> • User centric design • Changes in travel planning, expectations and experiences 	<ul style="list-style-type: none"> • Location independent accessibility • Immediate access to information and sharing of information to support decision process 	<ul style="list-style-type: none"> • User centric communication and products • Influence of eWoM on travel decisions • personalisation 	<ul style="list-style-type: none"> • Diversity in media use • Increased visual/audio content 	<ul style="list-style-type: none"> • Increased social media conversations through smart phone apps • Co-creation • Increased visual/audio content sharing • Platform switching/merging without user implications

Figure 2 : Technology and Communication Timeline

This has required tourism stakeholders to consider of how to build and maintain relationships (Dwyer et al., 2009; Leung et al., 2013) and how to position themselves (Buhalis and Law, 2008; Dwyer et al., 2009), reinventing traditional distribution and marketing processes (Buhalis, 2003; Werthner and Klein, 1999).

To provide a comprehensive overview of those changes and the links to the research papers presented, a timeline was developed (*Figure 2 Technology and Communication Timeline*) which outlines technological developments and application and their corresponding changes to tourism visually.

The reoccurring process of new technologies and new ways to communicate have established eTourism as a research field within tourism (Buhalis and Law, 2008; Wang et al., 2010). Figure 2 acknowledges this duality of technology and communication developments by discussing technological developments prior to communication technologies. Although the boundaries between them are becoming shorter and more blurred.

eTourism is frequently defined from an organisation-oriented perspective (Poon, 1993; Werthner and Klein, 1999) “as the digitisation of all the processes and value chains in the tourism, travel, hospitality and catering industries that enable their organisations to maximise their efficiency and effectiveness” (Buhalis, 2003, p. XXIV). This definition mirrors the early developments which brought operational efficiency, a greater global distribution and strategic changes in product distribution to tourism (*Figure 2 Technologies 1970-1990*) (Buhalis, 2003; Buhalis and Law, 2008).

Tourism is information rich, communicating its service based products with their unique intangible and perishable products (Hannam and Knox, 2010). In-line with changes in communication technologies, major long term impacts have occurred, changing the sector permanently (Buhalis and Law, 2008, Hannam et al., 2014). This was enabled through the developments of search engines, creativity in web design and decision support system. Tourism is the most searched for information on the Internet (Hartley et al., 2013). The role of tourism consumers has increased in importance and their voice influences

businesses stronger than ever before (See *Figure 2 Changes to tourism, Communication 2000-2010*).

Werthner and Klein (1999) already identified structural changes to tourism consumer behaviours with tourists having higher expectations on services provided, more specific and flexible offers and arrangements, a stronger need for more information, especially visual information, and a stronger price sensitivity. They also identified that tourists are making more but shorter vacations, and their time span between booking and consumption has decreased. They noted changes in the tourists themselves, as they have become more mobile, less loyal, more critical, and who listen more to other users in their decision making process. (See *Figure 2 Changes to tourism, Communication 2000-2010*).

This change of consumer contribution to tourism information started early (Buhalis, 2003) through consumer (user) forums. Travel blogs became a major driver in user generated content and prompted the start of user driven web sites such as Wikipedia, Virtualtourist.com, and later Tripadvisor. The development of social media platforms has taken user generated content a further step, and consumer choices and opinions influence the business success. Opinions and perceptions, and how to respond to those, have become essential in sustaining a successful organisation and business (Jones et al., 2015; Ye et al., 2009; Zhang et al., 2010). Many authors take a positive stand towards technology (Archdale, 1996; Buhalis, 2003; Buhalis and Law, 2008; Werthner and Klein, 1999), but they also recognise the challenges and limitations ICTs have brought. (See *Figure 2 Changes to tourism, Communication 2010-2015*).

Consumers have changed the way they research, choose, conduct and consume their travel. They search differently (Mitsche, 2005; Xiang et al., 2015) because of the information choice available through the Internet (*Figure 2 Communication 2000-2010*), and their opinions generated via social media have become central for their planning and booking choices (*Figure 2 Communication 2010-2015*) (Gretzel and Yoo, 2008; Leung et al., 2013). Technologies are now integrated in our everyday lives, we heavily rely on

them as an external memory space (Sparrow et al., 2011) (Figure 2 *Communication 2010-2015*). As such they have become an integral part in our holiday experiences, also influencing the experiences themselves (MacKay and Vogt, 2012) and our engagement with them (Hannam et al., 2014).

The current emerging trends in technology of faster data streaming is enabling increased visual/audio content consumption and content sharing (Figure 2 *Technology 2016 onwards*). Through the increased sharing of content and opinions, the previously more private holiday experience is moving more towards the public space, becoming accessible to users and tourism stakeholders (Munar and Jacobsen, 2014). Co-creation is part of the experience (Greg, 2016) as is externalised self-representation through the co-creation (Mkono and Tribe, 2016) or self image (Lyu, 2016) (Figure 2 *Communication 2016 onwards*).

The use of game design elements in non-game contexts (Deterding et al., 2011), or gamification, is another emerging trend. Pine and Gilmore's book (1999) on the Experience Economy resurfaced a greater discussion of the role and value experiences have for experience based industries such as tourism. This focus on memorable experience in gamification recognises the similarities of experience and game designs (Egger and Bulencea, 2015) to enhance consumer engagement, customer loyalty, brand awareness, and user experience in tourism areas (Xu et al., 2013). Within the service context of tourism, a more specific definition of gamification by Huotari and Hamari (2016) being the "refers to a process of enhancing a service with affordances for gameful experiences in order to support users' overall value creation" emphasises the importance of experiences to create value.

Gamification is an opportunity, it "creates entirely new engagement models, targeting new communities of people and motivating them to achieve goals they may not even know they have" (Burke, 2014, p. 4). The elements of gamification have been recognised in tourism literature and examples (Egger and Bulencea, 2015; Weber, 2014) through recommendation systems (Gretzel et al., 2004), social media applications (May, 2011), through

immersive technologies at heritage attractions (The Roman Baths, 2016), gamified restaurant experiences such as the McDonalds Monopoly Game (Cox, 2016), trail and treasure hunt games (Correa and Kitano, 2015; Ojoo, 2016), virtual reality (Australia, 2016) and augmented reality applications (Jung et al., 2016; Pokemon Go, 2016).

Location based services and advances in mobile services have emerged as a theme within eTourism earlier (Zipf, 2002) and interactive map based applications have supported tourism activities in various ways (Google Maps, Around me, map based destination guides). Advances have recognised, it is important and possible for tourism business to be social (social media), mobile and context aware (Colomo-Palacios et al., 2016).

Improved mobile service data streaming capabilities and the ability to integrate different platforms and technologies within the mobile technology context, is empowering the creativity tourism has looked for in the *digital reality* realm in the last 20 years (Levensohn, 2016). Virtual and augmented reality applications have already been discussed in the gamification context. The integration of location based services with an augmented reality approach utilising user defined (tourism) attractions as game markers in the Pokemon Go game (Pokemon Go, 2016) is bringing the augmented reality to the mass market.

2.2 Destination marketing

The complex nature of promoting destinations in a changing global and online environment requires novel, unique approaches to gain a competitive advantage in a saturated marketplace. Destination marketing today has many challenges. Conveying that sense of place, while differentiating themselves from others, is still the priority of destination marketing (Pike, 2008).

The principles of destinations marketing (Gretzel et al., 2000) of attracting, engaging and retaining users, learning about their preferences and relating those back to provide personalisation still hold true. Plog's psychographic predictors for travel personalities underpinning holiday and destination choice

("Best Trip Choices," 2016; Plog, 2001, 1974) are still prominent in marketing decisions and heavily debated in the academic community (Larsen, 2007; Litvin and Smith, 2016; McKercher, 2005; McKercher and du Cros, 2003; Pearce, 2011; Plog, 2006). Discussions on TRINET, an email based tourism research and education community (TRINET, 2016) continue to emerge (March 2016, September 2016) about its applicability and predictability accuracy, as well in trying to fill the gap in motivations for not travelling. The application of personalisation is perceived to be important for destinations (Buhalis and Amaranggana, 2015), and larger destinations such as Australia or Vienna have applied functionalities such as personalised trip planners and favourites (Australia, 2015; Vienna, 2016).

Destinations though had to adjust the way they compete in this dynamic environment, in particular how they communicate with their consumers and their stakeholders (Buhalis, 2003; Mariani et al., 2014). The increased competition through online globalisation does not necessarily imply positive impacts on the tourism industry (Ivanov and Webster, 2013); it is just as important to take on the challenges of today's destination marketing. Destinations are increasingly recognising the importance of collaboration of stakeholders within the tourism destination but also among destinations themselves (Mariani et al., 2014).

Destination marketing has quickly moved on from replicating marketing brochures online to being an interactive and reputable source of information about the destination and their stakeholders, as well as trying to position the destination by creating realistic but unique expectations to their visitors. As such, destination marketing organisations are becoming curators of travel related information and storytellers to promote themselves, their assets and their stakeholders (Gretzel, 2015; Woodside, 2010; Woodside et al., 2007).

Alongside these developments, visiting a destination's online provision has to provide an experience in itself for their online visitors (Conrady, 2007) to ensure repeat visits, brand loyalty and conversion rates. This corresponds with the greater emphasis on the value of experiences and creating memorable experiences (Mei, 2014; Pine and Gilmore, 1999). As such

destinations had to understand the change of how consumers search and decide online and connect this to actual tourism behaviour (Mitsche, 2005; Pan, 2015; Pan and Fesenmaier, 2006). This involves understanding and supporting consumers online, improving online destination presence and competitiveness within the global market place, and developing innovative ways to create new marketing applications and unique selling points (USPs) by using technology to enable improved access and utilisation of their assets. Technology, the Internet and social media provide the opportunities for destinations to do so (Harrigan et al., 2017; Sigala et al., 2012).

Social media plays an important role for destinations' customer engagement to convey their brand and related messages to the prospective visitors (Harrigan et al., 2017). Recent research investigates more closely the relationship between destination brands and visitors (Harrigan et al., 2017), their appearance through social media reviews (Kladou and Mavragani, 2016), the effectiveness of social media campaigns (Wozniak et al., 2016) and the use of micro-moments in the relationship building process (Steimer, 2016).

This requirement for destinations to anticipate change is emerging in the current academic discussions under the theme of SMART Tourism (Del Chiappa and Baggio, 2015; Gretzel et al., 2015; Li et al., n.d.). It derived and merged from the SMART cities concept (Caragliu et al., 2011) including sustainable development as an integral part of the concept and the idea that the use of technologies provide a more meaningful and sustainable relationship between destinations and its visitors (Molz, 2012). Smart requires "doing the right thing in various complicated circumstances" (Li et al., n.d., p. 2), placing an emphasis beyond intelligence and including an idea of forward looking and responsibility to the future (Molz, 2012).

2.3 Heritage Tourism

Historic buildings and culture already attracted curious people in Egyptian, Roman and medieval times encouraging them to travel from far afield to unique destinations (Timothy and Boyd, 2006). The gazes on history (Urry,

2002, p. 94) are part of the development of a notion of heritage in the tourism context and heritage tourism itself (Timothy and Boyd, 2003). This museum inspired and perceived curatorial approach has a strong focus on maintaining and conserving buildings (Garrod and Fyall, 2000) and items with an acceptance that heritage “is the present day use of the past” (Graham et al., 2000; Timothy and Boyd, 2006, p. 2), and by linking to the past it is referring to some sort of inheritance, either physical, or in the form of traditions, passed on to future generations (Tunbridge and Ashworth, 1996).

As in any inheritance process, there is a selective process which assigns value to heritage, traditionally performed by the ruling classes or the society, who identified what they would like to preserve. As such, heritage has been misused too often for different political, social or economical reasons (Graham et al., 2000; Timothy and Boyd, 2003). Only recently has there been a pursuit of preserving everyday life, but subjectivity and nostalgia are linked strongly to those pursuits (Hannam and Knox, 2010). “If history is an academic pursuit concerned with uncovering the past, heritage is about the creative application of meaning and significance to sites to create historical touristic interest” (Hannam and Knox, 2010, p. 141).

The increased interest in heritage for tourism pursuits (Prentice and Duncan, 1994) went hand in hand with places identifying new unique selling points (USPs) (Prentice and Andersen, 2007) through utilising their local heritage attractions and traditions (Mitsche et al., 2013). Cultural heritage, tangible and intangible, has always had the ability to create unique images and meaning in visitor's mind. Through the interpretation process, which encourages visitors to actively engage in the stories told (Tilden, 1957), and create their own mindfulness (Herbert, 1989; Prentice and Light, 1994) connecting the experience to their authentic self (Knox, 2008; Wang, 1999), heritage becomes a consumption process. It also means that the stories to draw tourists in and entertain them have become highly important (Hannam and Knox, 2010) and their attractiveness and the ability to commodify them has become an integral part of the heritage conservation strategy for their survival.

Heritage conservation bodies have taken a historical significance and curatorial approach, but they also have a responsibility to promote access and understanding (Price, 2005). Their local fundraising appeals, asking support from the public for funding to preserve their local heritage such as saving Seaton Delaval Hall (Britten, 2009) are signs of a stronger bottom up approach in the heritage sector. Local communities have stronger involvements in interpreting their heritage within attraction (Price, 2005), and as such destinations have recognised their potential for destination marketing purposes (Mitsche et al., 2013).

Similar to discussions in gamification and destination marketing, the experience economy outlined by Pine and Gilmore (Pine and Gilmore, 1999) also influences the heritage sector (Bærenholdt et al., 2008). As tangible heritage relates to physical objects ranging from small to the large objects of heritage sites themselves, the experience of these places and their objects connects very much to the tourism experience.

Experiencescapes discussed by O'Dell and Billing (2005) put a focus on the spaces and materiality of experiences to understand the cognitive, social and cultural processes which frame them. Those places are staged and planned for consumption by stakeholders, including destinations for different communities, which include tourists, and are very much part of our everyday life (O'Dell and Billing, 2005).

Experiences of intangible heritage gaze on performances raise very much the questions of authenticity (Knox, 2008; Wang, 1999) and commodification of ethnicity (Kaltmeier, 2016). Smith (2006) includes people as part of the heritage experience as“ .. heritage had to be experienced for it to be heritage ..” (Smith, 2006, p. 47). Intangible and tangible heritage are merging through this into one.

The shift “from the visual/symbolic consumption of objects to the actual (co-) presence of living, sensing, breathing and doing” (Haldrup and Larsen, 2009, p. 3) of people in the circumstance of heritage consumption represent a performance in the space provided. This contrast from the heritage-of-things

to the heritage-of-performance discussed by (Haldrup and Bøerenholdt, 2015) takes away the importance of tangible or intangible, but focuses heritage on its emergence from its social practices and uses to which people put it.

Cultural heritage attractions and destinations are recognising the potential of digital technologies to improve access to cultural heritage assets with particular opportunities for untold stories of intangible heritage (Mitsche et al., 2013). With this re-emerges the debate “converting education into edutainment and transforming the traditional museum into a theme park” whereby others have embraced the opportunity for their potential to make exhibitions accessible to more diverse audiences, boost attendance, and attract more revenue” (Stogner, 2011, p. 117). But the opportunities go beyond the improving ones performance. Immersive technologies provide opportunities in storytelling, involving the visitor as part of the story and providing sensory experiences (Stogner, 2011), and as such creating more memorable experiences.

Virtual and augmented realities are the main drivers in this context. Virtual reality creates a simulation and interaction through multiple sensorial channels such as visual, audio, touch, smell and taste (Burdea and Coiffet, 2003). Its experiences include the idea of virtual travel without leaving, the prospect of a tourism substitute (Guttentag, n.d.). Examples already include experiences in attractions such as Dynamic Earth in Edinburgh (Dynamic Earth, 2016) or the opportunity for children to travel during their hospital stay (Carey, 2016). Further application of virtual reality are based in tourism planning and management, marketing, entertainment, education, accessibility and heritage preservation (Guttentag, n.d.; Jung et al., 2016).

Augmented technology merges the virtual with the real world, making location based and context aware applications through mobile technologies an ideal communicator to deliver augmented experiences (Jung and Han, 2014; Kounavis et al., 2012). Successful applications of augmented reality are the Gamar application of the British Museum (Innoation Warehouse, 2014) or more recently the Pokemon Go game (Pokemon Go, 2016).

The application of virtual and augmented realities in the ideal scenario has an emphasis on the importance of creating value for the user through the experience (Huotari and Hamari, 2016), ideally representing a meaningful experience (Jung and Han, 2014; Stogner, 2011). In contrast, both applications have been criticised for difficulties in being able to deliver these meaningful and content rich experiences, lack of later interpretation, inability to create visitor engagement, lack of sense of place and technological limitations (Tan and Rahaman, 2009). As within any new technology the application can create new engagement models (Burke, 2014) and as such, it is important for stakeholders not only to replicate but be smart about it (Molz, 2012) to overcome those limitations.

2.4 Summary

This chapter has introduced the main themes of this research of eTourism, destination marketing and heritage tourism, providing an updated review in relation to the themes covered in the presented papers.

In eTourism the duality of technological and communication development are presented through a time line, and special emphasis is given to the most recent developments in the co-creation of social media, gamification and the experience economy, and location based and context aware applications.

The section of destination marketing draws attention to the challenges and changes destination marketing organisations faced through technology innovations. It draws on recent debates on the psychographic typographies in marketing planning, the experience economy, social media, and smart destinations.

It concludes with a section on heritage tourism, focusing on intangible tourism, commodification of local heritage for destination marketing, the heritage-of-performance and a reflection on the opportunities through immersive technologies.

3 Methodology

This chapter discusses the different methodologies applied to the research papers and their underpinning research philosophies. Section 1 provides a general overview of research philosophies relevant to the research papers. It further discusses research philosophies in the context of tourism as well interdisciplinary research. The section concludes with a reflection on philosophies on my personal research journey and the papers presented. Section 2 provides an overview of the methodologies applied for each research output, and discusses quantitative, qualitative and mixed methods. It provides further detailed insights of data gathering and data analysis methods. The chapter concludes with a short summary.

3.1 Research philosophies underpinning the research

This section discusses the research philosophies underpinning the research presented. It examines the relevant research philosophies in general, their context in tourism and specifically their influence on the researcher and the research presented.

3.1.1 Positivism

Positivism pursues the path of measurability and “that science must be conducted in a way that it is value free (objective)”(Bryman, 2015, p. 24) implying that it is possible for science to be objective. It emerged from natural science and the paradigm was applied to social sciences.

Researchers within the positivist paradigm are looking for causality, generalisation, and are generally attempting a more objective approach (Altinay and Paraskevas, 2008). Their viewpoint is “that if a phenomenon could not be verified, then it was untrue and did not exist”. In addition, results which are true and which cannot be doubted if they have been verified through statistical testing (Botterill and Platenkamp, 2012, p. 149) was and continues to be criticised. The core strength of positivism is it’s strive for objectivity and transparency in data collection and analysis (Crook and Garratt, 2011).

Research methods within the positivistic paradigm are supported by quantitative methods, which drives to gather facts to obtain new knowledge, which then can be tested through a deductive approach (Bryman, 2015).

3.1.2 Realism and the concept of falsification

One stream of criticism can be summarised under the post-positivist movement of realism. *Realism* mainly criticises the positivists urge to hold on to the truth. In contrast a realist accepts “that concepts they use to understand are likely to be provisional” (Bryman, 2015, p. 25). “Reality is not completely rational” (Platenkamp and Botterill, 2013) and in that sense is not inevitable but can be revised.

Similarly Popper’s *concept of falsifiability* criticising its unfaultable truth advocates the concept of hypotheses where knowledge and theories are derived but are only true until they can be falsified (Crook and Garratt, 2011; Popper, 1974). This rejection of certainty in science is inclusive to non-science, indirectly acknowledging that it does exist and may even be true without being certain about it. Although it has to be said that Popper criticises parts of social science as pseudo science when theories and knowledge are not falsifiable and are, as such, too descriptive (Shea, 2016).

The value of positivism and its influence on post-positivism shouldn’t be dismissed. The processes of objectivity and value free, how we conduct social sciences through quantitative methods are still being upheld and applied (Botterill and Platenkamp, 2012) and part of an internalised code of conduct of quantitative researchers.

3.1.3 Interpretivism

A more emancipatory social science needs to go “*beyond* the positivist perspective to reveal deeper structures and collecting reliable evidence to deal with uncertainty and setting out logical frameworks to highlight causality and relationships being reflective” (Jones, 2011, p. 209). Social science is more inclusive, “methods that are exclusively scientific-positivist may have only limited application because of their lack of attention to meaning and values” (Tribe, 2001, p. 442).

As such *interpretivism* contrasts the positivistic perspective as social sciences is fundamentally different from natural sciences. As such, it calls for different research procedures, one that reflects the distinctiveness of humans; an understanding rather than an explanation approach (Bryman, 2015 p. 28). Research within interpretivism is connected to qualitative research methods and an inductive perspective where researchers tend to collect more detailed and case study focused data in an attempt to “understand the context of which phenomena and behaviours take place” (Altinay and Paraskevas, 2008, p. 75). It offers deeper insights into people’s feelings, experiences, attitudes and beliefs (Altinay and Paraskevas, 2008) and the meaning attached to those. There is a greater flexibility during the data collection, in enabling the researcher to engage in new and/or unexpected emerging themes (Finn et al., 2000). They are though criticised for shortcomings in reliability and validity due to a lack of generalisation and replicability of the research, and the more subjective influences possible through the researcher (Finn et al., 2000).

3.1.4 Pragmatism

Many researchers have a preferred paradigm and attach methodological approaches they feel comfortable with, often sticking with and defending either quantitative or qualitative research as the most appropriate way of doing things (Altinay and Paraskevas, 2008; Berg and Lune, 2013). There appears to be a tendency to polarisation and incommensurability linked to underlying philosophies or schools of researchers (Johnson and Onwuegbuzie, 2004; Tribe, 2010; Tribe et al., 2015) which can be illustrated through the behaviour versus meaning issue (Bryman, 2012). Such preferences and a dominance of a paradigm can obstruct development, as an example in IT implementations highlights, where thinking outside the dominant post-positivist paradigm could improve success rates (Alford and Clarke, 2009).

No research method should be perceived as superior to others. They are appropriate in the context of the research conducted which should enable the researcher to answer the research question and objectives (Johnson and

Onwuegbuzie, 2004). This could be either from the quantitative or the qualitative spectrum or a combination of the two (Finn et al., 2000).

Mixed methods approaches are perceived to be outside the continuum line between the positivist and interpretivist paradigms enhancing their credibility by embracing a pragmatic philosophical approach (Pansiri, 2006, 2005; Wright and Losekoot, 2012).

Pragmatists refute the idea that 'truth' can be determined once and for all. Pansiri (2005) discusses W. James work, and his influential perspective on pragmatism today. Pragmatists see 'truth' as a normative concept, just like 'good' and maintain that 'truth is what works'; hence knowledge claims cannot be totally abstracted from contingent beliefs, interests and projections (Pansiri, 2005, p. 197).

3.1.5 Interdisciplinary

Interdisciplinary research refers to research "that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines" to go beyond the traditional practice in a single area (Committee on Facilitating Interdisciplinary Research, 2004, p. 2). The papers presented reflect those interdisciplinary practices. Innovation and expansion of knowledge were enabled due to engaging in open discussions with researchers from different disciplines and exposure to work within different disciplines.

Tourism emerged as an interdisciplinary research area in the 20th century from the main areas of economics, sociology, psychology, geography and anthropology (Jafari and Brent Ritchie, 1981), and in their more in depth analysis they identified overall fifteen areas with which tourism can be interlinked with. Tribe (1997) talks in its reflection of the indiscipline of tourism, a field which is studied in different disciplinary ways, thereby calling to celebrate and recognise its diversity. Even though it has developed an acknowledge research field, which is often studied in the multidisciplinary context, there is still a lack of truly embracing the interdisciplinary opportunities (Darbellay and Stock, 2012).

3.1.6 My philosophical research journey

My research journey mirrors, in part, the tourism discipline's paradigmatic development, from the traditional positivist perspective through the hybridity and transdisciplinarity to embracing the creativity, hybridity and messiness reflected in the wider qualitative social sciences and its complementing paradigms (Wilson and Hollinshead 2015).

The earlier papers (Bauernfeind and Mitsche, 2008; Gretzel et al., 2004; Mitsche, 2005) presented in this portfolio of research papers are influenced by the positivistic perspective, exploring data to generalise and generate knowledge. My earlier background, as a statistician, was greatly influenced by this positivist view of collecting and analysing data under the preamble of objectivity. It exposed me to the positivism of the Wiener Kreis and, more particularly, the concepts of post-positivism of Popper's falsifiability (Popper, 1974; Shea, 2016). Studying statistics, and my early research within the context of medical science, was underpinned by the importance of objectivity and transparency in conducting research. It influenced and internalised a way of developing social science research methodologies and a concept of reliability and validity, where knowledge and theories have to be created in the way to allow falsification and criticism.

Working collaboratively with researchers from different backgrounds and the realisation of limitations of the strict positivist perspective, post-positivism started to influence my research (Mitsche, 2005, 2002; Mitsche and Bauernfeind, 2008). As Tribe (2010) highlights, researchers' exposures to different communities and networks influence their development. Although this influence never led me to internalise an interpretive perspective. The exposure within the British geography tourism academy and interdisciplinary European projects led to a more external personal discourse on research philosophies and methodologies. It allowed me to push boundaries and comfort zones while conducting research (Mitsche et al., 2013, 2009, 2008b). Going beyond the comfort zones of my own beliefs and internalised research methods allowed me to create innovation in research (Johnson and Onwuegbuzie, 2004).

From today's perspective, questioned on my alignment with any philosophy, I would align myself mostly to the pragmatic perspective. This alignment is biased towards the post-positivist perspective but open to other philosophical perspectives, utilising them when required. Overall though, I personally perceive an alignment to any particular philosophy as restrictive, as not being bound enables an open mind for creativity and exploration beyond any individual comfort zones.

3.2 Research methods

The research presented expands beyond the field of tourism linking to the area of computing, adding a further layer of interdisciplinary challenges and opportunities. Multidisciplinary approaches, compared to interdisciplinary approaches, involve a dynamic interaction of the disciplines included in the research. There is a process of dialogue and a co-construction of knowledge, "through borrowing of another scientific field's concepts or transfer of concepts and methods of one scientific field to another" (Darbellay and Stock, 2012, p. 453).

eTourism has emerged as such a scientific field, in particular as technology has transformed how tourism is experienced, consumed and offered (Buhalis and Law, 2008; Leung et al., 2013; MacKay and Vogt, 2012). As such it encompasses empirical research, but also system and conceptual design as well as mixed approaches (Wang et al., 2010).

This section provides an overview and a discussion of the research methods applied in the presented papers. Table 1 lists each research paper and presents the data collection and analysis methods utilised. The papers have been ordered by their occurrence within the chapters, which mirrors their order within the research objectives. Continuing from the previous discussion on research philosophies, the table highlights that the research conducted includes quantitative, qualitative and mixed methods approaches.

Table 1: Overview of Research Methods Applied (Papers ranked by research objectives)

Paper	Methodologies used	
Tell me who you are and I will tell you where to go – Use of travel personalities in destination recommendation systems (Gretzel et al., 2004)	Questionnaire survey Statistical analysis <ul style="list-style-type: none"> • Descriptive • Discriminant analysis • Correspondence analysis 	Quantitative
Conceptualization of a Global Trip Planning Recommender System for Tourism Recommender Systems (Mitsche, 2002)	Recommendation system data framework <ul style="list-style-type: none"> • User centric design • Development of online self-categorisation (questionnaire) 	Quantitative
Personalised Travel Counselling Systems: Providing Decision Support Features for Travellers (Mitsche, 2001)	Architecture of the web information system <ul style="list-style-type: none"> • System design 	Quantitative
Understanding the Information Search Process within a Tourism Domain-specific Search Engine (Mitsche, 2005)	Log file data set Statistical analysis <ul style="list-style-type: none"> • Descriptive • Cluster analysis • Discriminant analysis Content analysis of keywords	Mixed methods
The Application of the Data Envelopment Analysis for Tourism Website Evaluation (Bauernfeind and Mitsche, 2008)	Based on aggregated data from a content mining tool <ul style="list-style-type: none"> • Data envelopment analysis • quantitative perspective on benchmarking 	Qualitative
Intangibles - enhancing access to cities' cultural heritage through interpretation (Mitsche et al., 2013)	Structured focus groups (workshop) <ul style="list-style-type: none"> • Analysis of worksheets • Development of interpretative strategies based on workshops and worksheets • Reflection on the final interpretative strategies developed 	Mixed methods
The use of technology for cultural heritage interpretation – examples from three cities (Mitsche and Bauernfeind, 2008)	Mixed methods methodology Quantitative <ul style="list-style-type: none"> • expert evaluation of web sites Qualitative <ul style="list-style-type: none"> • Interviews • Observations 	Mixed methods
Enhancing cultural tourism e-services through heritage interpretation (Mitsche et al., 2008b)	Questionnaire survey (visitors) Statistical analysis <ul style="list-style-type: none"> • Descriptive analysis • Chi-square tests Web site analysis <ul style="list-style-type: none"> • Content analysis (quantitative and qualitative) 	Quantitative

3.2.1 Quantitative Methods

Quantitative methods can be perceived as a large umbrella term, which includes the focus of the application of statistical methods, but also includes theories and practices and elements associated with quantitative methods such as sampling and questionnaire design (Somekh and Lewin, 2011). Quantitative research in this context includes questionnaire design, descriptive statistics to characterise and interpret, inferential statistics to evaluate and reflect on relationships and links, and multivariate statistics to explore and confirm patterns.

Quantitative methods applied in the research presented were descriptive statistics such as frequencies, mean and standard deviation. Inferential or bivariate statistics applied in the research presented focused on the chi square tests, which provides a significant test to the comparison of frequencies in different groups.

The variation of multivariate methods is larger. It includes cluster analysis (identification of groups utilising multiple variables), discriminate analysis (confirmation analysis of groups), correspondence analysis (statistical and visual method to structure relationships) (Hair et al., 2014) and data envelopment analysis (DEA, quantitative approach to evaluate efficiency and identify benchmarking partners) (Wöber, 2007a). The data envelopment analysis as a method is outlined in more details within this chapter in the context of measuring efficiency.

3.2.2 Qualitative Methods

Qualitative methods are associated with an in-depth, empathetic understanding. Its recognition of multiple realities and worldviews, as well as the way they are constructed aim to provide insights into phenomena (Gill et al., 2012). The focus is on exploring realities while at the same time recognising that there is an underlying element of subjectivity in the relationship between the researcher and participants. The data collected is of textual, visual or oral nature. In its analysis process the research is guided by the data, developing themes arising from it rather than investigating hypothesis (Bryman, 2015; Gill et al., 2012).

Qualitative methods used include focus groups, interviews, participant observation (Berg and Lune, 2013; Bryman, 2015; Somekh and Lewin, 2011), case studies and textual data from the search engines and web sites. Data was analysed through content analysis manually.

3.2.3 Mixed Methods Research

Many researchers have a preferred methodological approach they feel comfortable with, often either quantitative or qualitative they stick to and defend as the most appropriate way of doing research (Altinay and Paraskevas, 2008; Berg and Lune, 2013). There appears to be a tendency to polarisation and incommensurability linked to underlying philosophies or schools of researchers (Tribe, 2010; Tribe et al., 2015) which can be illustrated through the behaviour versus meaning issue (Bryman, 2012). But no research method should be perceived as superior to others. They are appropriate in the context of the research conducted which should enable the researcher to answer the research question and objectives. This could be either from the quantitative or the qualitative spectrum or a combination of the two (Finn et al., 2000).

Mixed methods are a combination or integration of “statistical analysis (quantitative data) with stories and personal experiences (qualitative data), this collective strengths provides a better understanding of the research problem than either form of data alone” (Creswell, 2015, p. 2). This approach is becoming increasingly used and accepted in social science research (Ateljevic et al., 2007; Bryman, 2012; Pansiri, 2005) overcoming issues of incommensurability. Both methods combined are mutually beneficial for the research context and combining them can help to overcome each other’s limitations. Applying mixed research methods provides the ability to obtain two different perspectives, obtain a more comprehensive view and more data specific to the problem, add context of experiences to factual data or conduct preliminary exploration (Creswell, 2015).

The push for mixed methods through the pragmatism paradigm (Pansiri, 2005) and humanist schools such as the *Academy of Hope* (Ateljevic et al., 2007; Pritchard et al., 2011), as well as tourism emergence from different

disciplines will only be successful as a discipline if the integration of different concepts and methods generates new concepts and knowledge (Oviedo-García, 2016).

For all methods, quantitative and qualitative alike, validity and reliability have been considered in the context of research conducted.

3.2.4 Validity

Both, validity and reliability are systematic approaches and are valid depending on their ability to answer the research question (Altinay and Paraskevas, 2008). Validity in the quantitative research context refers to the collection of data which enables answering the research question, and ensures that what the research has set out to measure actually was measured (Altinay and Paraskevas, 2008). In relation to qualitative methods, the concept of validity has been widely discussed, replacing the it with a variety of concepts, leading in many ways “to an almost bewildering array of definitions and variations on definitions” (Lewis-Beck et al., 2003, p. 957). In one position it adapts as closely as possibly the interpretation of validity from the quantitative methods, in another perspective it is suggested to assess qualitative methods with a complete different set of criteria of trustworthiness and authenticity (Bryman, 2012). Validity in the research papers presented was assured through representativeness of the research, but also through consistency checks in the research instruments prior to data collection.

3.2.5 Reliability

Research methods also need to take into account their reliability. Reliability in the quantitative research context refers to the stability or consistency of measurements and the transparent process in which the research has been conducted, and where the studies and results are replicable by other researchers (Altinay and Paraskevas, 2008). In the qualitative context, the argument of repeatability refers to the stability of the results over time as well as that it is possible to derive similar results from different research methods. The alternative view point to this is based on the argument that researchers' are only able to view the world from a particular place in the world, consequently making the concept of reliability a non issue (Lewis-Beck et al.,

2003). Within the research papers presented, reliability has been insured by a structured and transparent approach. In particular, where different researchers were collecting the data (Mitsche et al., 2013, 2008b; Mitsche and Bauernfeind, 2008), clear instructions and communication throughout the process were essential. Sampling decisions were made in a transparent way and communicated in detail in the research papers.

3.2.6 Data Collection

Quantitative data collection methods encompassed questionnaires, web crawlers, or originated from log files. This compares to data collected in similar contexts by other authors (Alzua-Sorzabal et al., 2015; Baggio and Klobas, 2011; Scharl et al., 2008).

The questionnaires included an expert evaluation of web sites based on usability questionnaire design (Lewis, 1995; Lin et al., 1997; Nielsen, 1994) integrated with components from heritage interpretation and heritage tourism (Copeland and Delmaire, 2003; Prentice and Andersen, 2007; Tilden, 1957). They also involved traditional visitor surveys (Baggio and Klobas, 2011) in the tourism and museum context.

Data was also collected through a content mining tool, the webLyzard (Scharl, 2012) which collects and analyses data presented on web sites and connects this information to log file data. The data was used as part of the data compiled in the context of the DEA analysis and as the main data set in analysing search patterns on destination web sites. The tool was one of the first available to researchers to utilise the content of web site information which was not hosted on their own domain, and as such provided unique insights in comparing different web sites, rather than analysing its own data.

From a qualitative data collection perspective, a structured focus group approach, observations and interviews were used to explore and understand new perspectives (Wilson and Hollinshead, 2015). Interviews and observations were applied within the mixed method approach of establishing a digitisation status of the ISAAC cities in the heritage tourism context. The

focus groups were applied in a staged workshop approach in developing an interpretative strategy for the ISAAC cities.

3.2.7 Data Analysis

This section provides an overview of the data analysis methods applied. It places a specific emphasis on the data envelopment analysis and its background of benchmarking.

Content Analysis

Content analysis was used to understand and categorize data (Auer-Srnka and Koeszegi, 2007) from the data content mining tool. This provided insights of the words used by users in the tourism search process. The words were categorised which then provided the basis for further statistical analysis. Content analysis was also applied in the context of the focus groups, interviews and observations.

Statistical Methods

The statistical methods applied within this collection of research are descriptive statistics, crosstabulation and chi-square test, and multivariate methods such as cluster analysis, discriminant analysis and correspondence analysis.

Data envelopment analysis (DEA)

DEA is a structured statistical analysis method to measure efficiency in the benchmarking context.

“Benchmarking is a process which continuously measures the products, services and operational practices of a given organisation to compare the organisation's performance and operational practices with a selected sample group” (Tölösi and Lajtha, 2000, p. 347). The main aim is clearly to evaluate its own performance in the context of nearest competitors to continuously improve, learn and grow (Dean Elmuti and Yunus Kathawala, 1997). As such it is a valuable approach for destinations as well as any business to learn from their nearest competitors. As such identifying where a destination is

placed within comparable competitors is an additional valuable way to reflect upon their own performance and to take steps to retain and improve their competitive advantage by continuously improving its own performance. Benchmarking to compare performance between businesses is a common approach in tourism (Sigala, 2003) and has been regularly used in the destination context (Assaf and Dwyer, 2013; Kozak, 2002; Reino et al., 2014; Wöber and Fesenmaier, 2004) applying varied qualitative and quantitative methodologies.

The DEA applied is based on linear programming identifying elements of efficiency and inefficiencies of decision making units (DMUs) next to suitable benchmarking partners. An important condition for a successful approach is that organisations taking part in the analysis must have the same business goals and objectives (Anderson et al., 2015; Nielsen and Loranger, 2006).

The application of DEA in research has increased since the mid 1990's (Gattoufi et al., 2004). Examples of DEA applied in the tourism sector can be found within the hotel industry (Hu and Cai, 2004; Oliveira and Pedro, 2015; Sigala, 2004), in the restaurant (Reynolds, 2004), museum (Remich, 2002), and in the destination context (Wöber, 2007a).

3.3 Reflection on my research journey

My research journey provides a connecting narrative for the research papers presented in the following chapters by outlining how each of my papers developed based upon my previous research. It highlights the gaps and research themes which were derived from completed research of those research papers, but also from my other research contributions and the EU research project reports. It discusses how on this basis each of next research (objectives) developed.

This discussion is focused specifically on the themes of the research papers and the gaps which led onto the next research project. Influences based on the changes in my research environment and my parallel philosophical research journey are highlighted in chapter 3.1.7.

The earlier research presented (Mitsche, 2002, 2001) provides frameworks for improved technical solutions for tourists from a destination perspective. This development is in parallel with the timeline where technologies were being developed, Google Search changed the way we structure our search, online travel booking systems were getting more sophisticated and destination management systems gathered success. The papers provided frameworks for such system developments. Within this research, it emerged that there is a need to improve travel recommendations for tourists. Gretzel et al. (2004) focuses on investigating such opportunities through suggesting a system which includes questions about the travellers' themselves, such as special interests. The research was able to link those interests with travel personalities and demonstrated an ability of travellers to self-categorise. A system based on a self-categorisation would simplify the process and increase the entertainment factor.

The research already relied on understanding the information search and decision process, but I identified there was a gap in terms of gaining a better understanding of this information search process online in more detail. This led me into analysing log file data from a destination search engine (Mitsche, 2005). The data had to be remodelled to analyse the whole journey of the user on the site. This perspective was new, and the insights of how impatient and simple users search, the importance of the homepage and the identification of different search patterns was novel. Search engines today have become more powerful and innovative but the simplicity and impatience in search is still the same.

As the research highlighted the importance of the web site as a starting and re-starting point, my interest moved into understanding what elements are required to create a good destination web site (Mitsche, 2005). The research investigated how destinations could benefit from each other in improving web site design through benchmarking. In addition, the research also highlighted that going beyond traditional web site evaluation is beneficial for destinations.

The theme of investigating beyond traditional web site evaluation continued through the ISAAC EU project. It provided an opportunity to investigate

destination and cultural heritage attraction web sites and the representation of heritage interpretation elements on the web site. (Mitsche and Bauernfeind, 2008; Zins et al., 2004) Many of the elements of heritage interpretation are mirrored in marketing strategies and, as such, previous research (Bauernfeind and Mitsche, 2008; Gretzel et al., 2004; Reino et al., 2007) informed the framing and conducting of this research (Mitsche et al., 2009, 2008a, 2008b, 2007; Mitsche and Bauernfeind, 2008). The work presented a framework for evaluating the status of representation of heritage interpretation elements on destination and cultural attraction web sites. It also outlined the use of technology and eServices by destination and cultural heritage providers. The framework was the baseline support for the project and the ISAAC prototype.

Through the research (Mitsche and Bauernfeind, 2008; Reino et al., 2007) the importance of heritage interpretation for marketing purposes emerged as a theme. Rather than evaluating its role, I decided to pursue a framework which enabled the integration of heritage interpretation in destination marketing with a focus of utilising technology in the process (Mitsche et al., 2013). The idea was based on finding new ways towards USPs while also supporting local heritage, and in the online context intangible heritage is an ideal communicator for this. The research also provided real strategies for the three cities, and underpinned the ISAAC cities case studies.

3.4 Summary

The research presented is set in the context of the interdisciplinarity tourism research presents itself, but also goes beyond the boundaries of tourism engaging in heritage and museum studies, computing and business studies .

My background grounded in statistics has been expanded through the years, and research has taken a mixed methods perspective, combining both quantitative and qualitative methods to provide a better and more in depth understanding.

From a philosophy perspective the research is strongly influenced by post-positivism and pragmatism. The journey of cooperation, interdisciplinarity and

mixed methods approaches will continue in the future to push boundaries and expand horizons in the research conducted.

4 To evaluate the potential for targeted online destination marketing through travel recommendation systems

Gretzel U., Mitsche, N., Hwang, Y.-H., Fesenmaier, D. (2004) ,Tell me who you are and I will tell you where to go – Use of travel personalities in destination recommendation systems', *Journal of Information Technologies and Tourism* 7(2). 3-12.

Best Paper Award,also published in conference proceedings and as book chapter.

Mitsche, N. 'Conceptualization of a Global Trip Planning Recommender System for Tourism Recommender Systems' in: Wöber, K. W., Frew, A. J., Hitz, M. (eds.) *Information and Communication Technologies in Tourism 2002*, Springer Vienna. 366-374.

Mitsche, N. 'Personalised Travel Counselling Systems: Providing Decision Support Features for Travellers' in: Sheldon, P., Wöber, K., Fesenmaier, D. (eds.): *Information and Communication Technologies in Tourism 2001*, Springer, Vienna. 160-166.

4.1 Background & Innovation

Consumers' information search and decision making, when planning for travel, is a multifaceted process where decisions made can influence the next stage, but are also changing dynamically with the circumstances and knowledge acquired during the search (Fodness and Murray, 1999). Although the stages of the tourist decision making process can be distinguished in problem identification, information search, information evaluation, choice and post choice (Moutinho, 1987), consumer pathways in making their choices are becoming increasingly fluid and influenced by internal and external criteria (Gursoy and McCleary, 2004).

As users' exhibit different search behaviours via different search channels, research needs to explore opportunities to keep and convince consumers to come back. Travel recommendation systems are one way to support consumer's decision making, and various systems use intelligent ways to improve recommendations to make useful choices (Staab et al., 2002). Most systems have derived from the processing of large amounts of information as

information retrieval systems, creating a relevant and efficient travel booking process. These have been discussed since the early use of technology in tourism (Hruschka and Mazanec, 1990; Poon, 1993; Sheldon, 1997; Werthner and Klein, 1999) and developed through its own research theme within the tourism and technology research area (Buhalis and Law, 2008; Law et al., 2009; Wang et al., 2010). The systems advanced their focus from processing information, to reflecting on the tourism decision making process, and including the provision of a useful user experience with user centric design and a focus on the intelligence of those systems (Ricci, 2002). Gretzel (2011) raises that those systems still lack various aspects in terms of the social reality of the decision and information search process where they provide “individual tourists with a mechanism to retrieve information when a need occurs/is identified rather than a true conversational partner in a continuous, social process” (Gretzel 2011 p. 771). This, and the information overload on the Internet, have led to a recent increase in the use of travel agents (Moseder, 2014).

But, interactive and entertaining ways to maintain that process and retain and gather new customers are just one way those sites can provide more of a human touch. The question of fun elements in recommendation systems has been put forward (Kim and Morosan, 2006). Quizzes, destination based user generated images (Berger et al., 2007; Nothing like Australia, 2013; Virablog, 2011), and self-categorisation through personalities (Gretzel et al., 2004), provide just some of the exemplary ways to engage customers in a more entertaining process.

Game-like add-ons are also being used as marketing tools in a playful way within the social media context, encouraging users to share and increase likes to the promoted products; the James Bond game used during the release of a new James Bond movie (Visit Britain, 2015) is just one example of this. As gamification within tourism marketing has become a new buzzword (Egger and Bulencea, 2015; Gartner and Ruzzier, 2011; Xu et al., 2013), the paper presented clearly highlights that they are able to make useful recommendations in a speedy and fun way (Gretzel et al., 2004) and

at an early stage. This still holds its importance as an approach today (Neidhardt et al., 2014).

The focus of the three papers presented here is on improving the travel recommendation experience. The papers consider travel recommendation systems and their role in the information search and decision making process, as well as their potential for destination marketing in supporting consumer choices. The papers provide an alternative to rule-based expert and recommendation systems by introducing creative elements in the tourists' decision making process. These elements are based on quantitative research, but enable marketers to introduce fun elements such as predefined personality categories which make the search and decision making for a holiday both entertaining as well as useful.

The key innovations presented in the papers are:

- Using self-personality categories for recommendation systems (Gretzel et al., 2004)
- Fun approach for a fast and still appropriate recommendation (Egger and Bulencea, 2015; Gretzel et al., 2004)
- Concept of a online trip planning system based on user centric design (Mitsche, 2002)
- Investigating opportunities of attribute and subject based approaches (Mitsche, 2001)

4.2 Methodology

The research papers presented have two different methodological approaches.

The first paper (Gretzel et al., 2004) is based on quantitative methods. It uses a selective number of three questions from a questionnaire survey by Northern Indiana (travel personalities, travel activities and destinations in Northern Indiana), analysing them to investigate their relationship based on discriminant and correspondence analysis between the actual visitor's trip activities and their self-defined personality types. The discriminant analysis

was used to confirm the distinctiveness of the self defined personality types. The correspondence analysis enabled a mapping between the personality types and the actual trip activities to discuss how they match.

Mitsche (2001) conceptual paper on travel decision system developed an architecture of an early stage web information system based on existing approaches and computer system frameworks integrating the tourism search and decision making process (Fodness and Murray, 1999). This was expanded by the development of an online self categorisation questionnaire to enable online recommendations in a second research paper (Mitsche, 2002) to support the trip planning process through a recommender system.

Limitations of approach are in the local context of the study, which does not include traditional mass tourism beach resorts.

4.3 Findings & Contribution

The understanding of the set up of recommendation systems and tourists information and decision making process were combined with their actual behaviour during a vacation. Data analysed highlighted that people are able to self categorise themselves, as well as making a connection between travel personalities and travel motivations and activities (Gretzel et al., 2004).

This enables destinations and holiday providers to use their actual holiday offers and combine them with knowledge on travel personalities to provide useful holiday destination recommendations for users in a fun way. Various providers have used similar examples on their sites.

The papers contributed to the understanding of a targeted approach to online travel recommendation by highlighting that

- Predefined categories provide a good fit for recommendations (better than by chance) (Gretzel et al., 2004) which provides as a fast and fun way to provide users with useful and relevant recommendations. This has impacted on future work and been cited in publications in the context of travel recommendations and travel recommendation systems.

- Personality categories and travel motivations and activities are connected (Gretzel et al., 2004), which enables the opportunity to self-categorise in a faster way in the travel recommendation process. It shows that travel personality also influences destination choice and as such it is a useful indicator (Leung and Law, 2010)
- Concept of online trip planning system (Mitsche, 2002) which integrated the stage tourists are in their information search process into a trip planning system
- Architecture of tourism focused web information system

4.4 Summary & Response to Objective

The main research objective of this collection of research papers is to evaluate the potential for targeted online destination marketing through travel recommendation systems. In (Gretzel et al., 2004) the main purpose is to investigate the use of predefined personality categories for recommendation systems to improve targeted destination marketing online. The field of using personalities online is still largely unexplored though reference to the research presented is regularly made either from a consumer perspective in eTourism travel personality research (Jani, 2014; Leung and Law, 2010) or from the online travel recommendation perspective (Buhalis and Law, 2008; Neidhardt et al., 2014; Steinbauer and Werthner, 2007).

The other two papers (Mitsche, 2002, 2001) develop a framework for global recommendation systems to evaluate the consumer experience of tourism web sites, along with the architecture of a travel information system and have been cited within the context of travel recommendation systems online.

The results from the research presented highlight that recommendation systems are a useful, effective and entertaining way to provide users with appropriate travel recommendations. As such they can be viewed as an integral part within destination marketing.

4.5 Papers

TELL ME WHO YOU ARE AND I WILL TELL YOU WHERE TO GO: USE OF TRAVEL PERSONALITIES IN DESTINATION RECOMMENDATION SYSTEMS

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Current efforts in destination recommendation systems research and design are based on the assumption that user preferences have to be captured in the most accurate way possible to be able to provide useful recommendations. However, leading the user through a series of mind-puzzling diagnostic questions is often cumbersome and, therefore, discourages use. This article explores travel personality categories as a possible shortcut to classifying users. The results of this study suggest that travel personality types selected by the survey respondents can, indeed, be matched up with certain travel behaviors. Implications for future research as well as systems design are presented.

Key words: Personality types; Discriminating power; Recommendation systems

Introduction

The lack of purchase information, infrequent use, and the pronounced variety-seeking tendencies of its users constitute serious problems for a destination recommendation system (DRS). Although collaborative filtering and case-based reasoning approaches have been developed to provide more suitable recommendations in the context of a DRS

(Ricci, Blaas, Mirzadeh, Venturini, & Werthner, 2002), there seems to be a need for more explicit ways of capturing user preferences. Leading the user through a series of questions in a sort of self-assessment process as suggested by Franke (2002) and Rumetshofer, Pühretmair, and Wöß (2003) is a possible way of establishing more sophisticated user profiles. However, such self-assessment modules are typically very cumbersome and time consuming for

the user to complete. They are usually only presented to the user at the time of registration, and are, consequently, more suitable to capture user characteristics that are relatively stable. For recommendations based on frequently changing preferences and/or situation-specific variables, however, providing users with a choice among predefined travel types or decision-making styles appears to be more suitable (Delgado & Davidson, 2002; Grabler & Zins, 2002; Zins, 2003). This idea of predefined categories has been implemented most frequently by first inviting users to select a product-related personality category and then adjusting the information content presented to the user based upon predetermined preferences that characterize the selected personality type (Fig.

1). The aim of this article is to investigate the extent to which such predefined personality types can be used to enhance the personal relevancy of recommendations provided in a DRS.

Background

Personality traits are believed to be able to accurately predict behavior over time and across situations (Woszczynski, Roth, & Segars, 2002). However, these personality traits can differ in their accessibility depending on context and situational cues (Aaker, 1999). The most widely accepted personality measure is referred to as the “Big-Five” model or “Five-Factor Model” and includes extro-

Trip Coach

People are as different as the trips they take. That's why Trip Coach finds destinations for you based on your travel interests. Select a personality or create your own, and we'll find destinations that are great for you.

Select the personality below that best describes you.

<input type="radio"/>  <p>WINTER WARRIOR</p> <p>All you need on your trip is snow. Skiing, snow boarding, and hanging out at the lodge mark your final destination.</p>	<input type="radio"/>  <p>SPORTS ENTHUSIAST</p> <p>Whether spectator or participant, your ideal trip involves anything sports-related <input type="checkbox"/> golf, tennis, baseball, football, and everything in between.</p>
<input type="radio"/>  <p>SIGHT SEEKER</p> <p>You revel in trips that keep you busy searching for the next tour, attraction, or landmark.</p>	<input type="radio"/>  <p>SEASONED SHOPPER</p> <p>Your motto is "shop 'til you drop." For you, traveling is all about finding the best shops and bargains in town.</p>
<input type="radio"/>  <p>OUTDOOR ADVENTURER</p> <p>The great outdoors and all that goes with it - hiking, biking, kayaking, canoeing, skiing, exploring - is your idea of a perfect getaway.</p>	<input type="radio"/>  <p>FAMILY TRAVELER</p> <p>From amusement parks to festivals to outdoor fun, you love to travel with your children, or you're just a kid at heart. Either way, your trip is usually playful and carefree.</p>
<input type="radio"/>  <p>CULTURE CONNOISSEUR</p> <p>Your perfect destination offers an abundance of art, architecture, galleries, and theaters.</p>	<input type="radio"/>  <p>BEACH BUM</p> <p>Your ideal trip revolves around enjoying the latest water sports, sipping tropical drinks, and working on your tan.</p>

Figure 1. Trip Coach by Trip.com

version, emotional stability, agreeableness, conscientiousness, as well as openness to experience as dimensions underlying an individual's personality (John, 1990). It has been found to be a very stable, robust, and reliable measure across many research domains. Most importantly, research in consumer behavior that used the "Big-Five" methodology has found a linkage between individuals' personality and their preferences for certain brands, suggesting that personality type is an important indicator for product choice (Aaker, 1997; Malhotra, 1988).

In tourism research, personality has often been used as a basis for market segmentation purposes, with Plog's delineation of travel personality types along an allocentrism–psychocentrism continuum having received substantial attention (Plog, 1974). Personality has also been related to the selection of vacation destinations, the choice of leisure activities engaged in while on vacation, as well as other travel-related decisions (Madrigal, 1995; Nickerson & Ellis, 1991). In addition, identifying a customer's personality has been proposed as a suitable tool for directing a customer to a preferable destination in the course of a travel agent–client interaction (Griffith & Albanese, 1996).

Existing personality research focuses on personality identification and subsequent personality type classification through sophisticated measurement scales that have only limited applicability in the realm of a DRS. Only very recently has personality-related research started to investigate the possibility of developing very brief measures of personality (see Gosling, Rentfrow, & Swann, 2003). However, such short diagnostic tests are believed to have several shortcomings, including inferior reliability and a restricted ability to capture specific personality facets. In addition, it is not clear how easy it is for individuals to select and identify with an existing topology of personality types (whether these are based on rigorously tested psychological measurement or the assumptions of marketing managers, as in the case of most personality categories found on the Web). Also, no evidence was found in the existing literature with respect to the power of such predefined personality categories to predict actual behavior.

Within the context of recommendation systems, personality is sometimes used in a very colloquial sense, referring to the user preference models or the

user classes on the basis of which recommendations are made. For instance, given certain preferences for some items, the probability that the user has the same "personality" as other users is calculated (Pennock, Horvitz, Lawrence, & Giles, 2000). Also, particularly in the case of destination recommendations, these categories are often based on preferences for certain travel-related activities (i.e., hiking, sightseeing, etc.) rather than preferences directly linked to any of the "Big Five" personality traits. Thus, what is referred to as a "personality type" in travel recommendation systems is often a preference structure that is assumed to result from, rather than directly describe, specific personality characteristics. One of the apparent advantages of such an "interest"—or preference-based categorization—is the ability to easily accommodate different travel needs based on situational changes, which would be harder to achieve in a classification model that emphasizes stable personality traits.

Examples such as the travel personality categories represented in Figure 1 suggest that certain linkages between personality and consumption patterns have been recognized by system developers; however, it seems that such approaches have been implemented without thorough consideration of the ability of such predefined travel personality categories to serve as substitutes for lengthy personality or travel needs assessment tests. The ultimate question that needs to be answered is whether these personality types can be used as the foundation for destination recommendations. However, the focus of this article is not on finding out what kind of information should form the basis of these categories (e.g., preferences for activities vs. Big Five personality traits). Rather, this article looks at the most commonly implemented typology on travel Web sites (i.e., activity-related personality types), and investigates whether or not sophisticated measurement is, indeed, necessary to enhance a recommendation process, or whether letting a user choose among predefined categories provides a valid shortcut to more personalized and, therefore, more relevant destination recommendations.

Methodology

The findings presented in this article are based upon a survey of 3525 randomly selected persons

who had requested travel information from a Northern Indiana tourism office during Summer and Fall 2001. The data collection took place during a 2-month period (November–December 2001). The survey methodology followed a three-step process designed to maximize the return rate. The initial mailing consisted of a cover letter, a survey, a postage-paid return envelope, and a description of the incentive. One week later, postcards were sent out to remind those who had not completed the survey and to thank all respondents for participating in the study. All nonrespondents were sent a survey kit 2 weeks later. The survey effort resulted in 1436 completed responses for a 42.1% response rate (113 letters were undeliverable).

The survey was comprised of a series of questions related to travel style, psychographic characteristics, and actual travel behavior. In one section respondents were asked to indicate the travel personality that described them “best” and the one that described them “least.” Respondents were provided with a total of 12 travel personalities from which to choose. Each personality type was described through a short paragraph (Fig. 2). The descriptions were initially adapted from examples found on the Web such as the travel personality feature Travelocity.com used to have in their Guides & Advice section. How-

ever, the descriptions were further adjusted and specific travel personalities were added to reflect personality types that could be attracted to visiting destinations in the US Midwest.

Travel motivations and travel styles were measured using 5-point Likert scales and values were measured using semantic differential scales. Respondents were asked to rate the importance of certain motivations (escapism, social contact, relaxation, excitement, physical activity, etc.) as well as the importance of certain destination features (scenery, good value for money, diversity, quaintness, etc.). Travel style questions focused on variety-seeking and multideestination travel patterns. Travel values examined the emphasis placed on stability versus excitement, family versus self, being passive versus being active, learning versus dropping out, and following tradition versus trying new things.

Actual travel behavior was elicited by asking survey respondents to indicate which destinations they had visited and in which activities they had participated during their most recent visit to Northern Indiana. A map of Northern Indiana was included in the survey to facilitate recall of the destinations that belong to this specific region. Respondents were asked to list up to 10 different destinations visited during their most recent trip; however, only the 20 most frequently mentioned destinations across all respondents were included in the subsequent analyses. Also, they were asked to choose among a list of 21 activities provided in the survey. Four of these activities (overnight stay, restroom stop, visiting friends/relatives, and other) were excluded from further analyses. Table 1 lists the travel personality types, destinations, and activities on which the analyses presented in this article are based.

Additional data were collected in the course of four focus groups that were conducted in Chicago, Illinois in the Fall of 2002. A total of 43 participants from the northern Chicago suburbs were recruited based on age, gender, and income level so that the structure of the groups represented the major target markets of the destination under consideration. An additional criterion for selection was that the participants were to have traveled in the Midwest within the last 18 months and were to have stayed in paid lodging. The groups were also screened to obtain respondents that were actively involved in travel decision making. All names for recruitment were

Below are 12 different travel personalities. Pick a travel personality that “best” describes you as you travel in the Midwest United States; then, choose one that does not describe your personal travel style at all. Please select only one for each category.

A. Culture Creature Loves everything cultural – theatre, shows, museums, festivals and fairs and local culture, too!	E. Beach Bum Somebody who has to lay around on the beach with little umbrellas pitched in their drinks.	I. Trail Trekker If it’s outdoors – you’re there. Hiking, walking, parks, forests, mountains, birdwatching, etc.
B. City Slicker An urban creature who goes where the action is. Loves clubs, meeting people and needs the pulse of the city.	F. Avid Athlete Always on the court or the course. Always in the game ... whatever game it is.	J. History Buff Travels back in time. Your vacation is a learning experience that focuses on historic facts and sites.
C. Sight Seeker Always ready to stop for that landmark, event or attraction.	G. Shopping Shark Stopped looking for a cure for your shopaholism?	K. Boater Your world is the lake and your boat is your home. Feeling the breeze is what you really care about.
D. Family Guy The destination is not what counts, it is the time you spend with your family that makes your vacation.	H. All Arounder You need to have it all. You go where there is lots to do and see.	L. Gamer Electrifying slots and skill-testing table games, fantastic fare and nightly entertainment are a crucial part of your trip.

Travel personality that “best” describes you (A-L): _____

Travel personality that does not describe you at all (A-L): _____

Figure 2. Travel-related personality types.

Table 1
Travel Personalities, Destinations, and Travel Activities Included in Analyses

Travel Personalities	Destinations	Travel Activities
1 Culture Creature	1 Shipshewana	1 Antique shopping
2 City Slicker	2 Michigan City	2 Beach/waterfront
3 Sight Seeker	3 South Bend	3 Biking
4 Family Guy	4 Nappanee	4 Bird watching
5 Beach Bum	5 Middlebury	5 Boat/auto/antique show
6 Avid Athlete	6 Goshen	6 Boating
7 Shopping Shark	7 Merrillville	7 Dining
8 All Arounder	8 Elkhart	8 Festival/special event
9 Trail Trekker	9 Chesterton	9 Gambling
10 History Buff	10 Valparaiso	10 Golfing
11 Boater	11 La Porte	11 Hiking
12 Gamer	12 Hammond	12 Hunting/fishing
	13 Crown Point	13 Museum/play/concert
	14 Angola	14 Nightlife
	15 Warsaw	15 Shopping
	16 Mishawaka	16 Sightseeing
	17 Plymouth	17 Visit historic site
	18 Portage	
	19 Lagrange	
	20 Ft. Wayne	

A series of descriptive and multivariate analyses was conducted to investigate the potential contribution of such travel personality categories to the recommendation process. First, the 12 travel personality categories were analyzed with respect to how much overlap exists between them and how easy it was for respondents to identify themselves with any of the personality types. Frequencies and cross-tabulation were used to explore the choice patterns of the survey and focus group participants. Discriminant analysis with personality types as the grouping variable and several psychographic and travel-related variables (travel needs/motivations, travel styles, desired activities, desired destination features, personal values) as independent variables was then conducted to assess the distinctiveness of the travel personality categories. Finally, correspondence analyses were conducted to assess the degree to which personality types and activities, as well as personality types and destinations could be matched.

Results

taken from the inquiry database of the Northern Indiana tourism office used in the previous survey effort. The focus group members were presented with a sheet of paper that featured the same 12 personality types used in the survey questionnaire. However, in contrast to the mail survey, the personality type descriptions were enhanced with small graphics and the focus group participants were allowed to choose more than one personality type if necessary.

Table 2 shows the frequency distributions for both choice settings. The top three travel personalities selected as being most appropriate were All Arounder (24.6%), Sight Seeker (21.6%), and Culture Creature (14.6%). This finding largely corresponds to market segmentation results found in previous studies for the area. The travel personalities selected most often as being not applicable were Gamer (38.8%), Avid Athlete (17.1%), and City

Table 2
Frequency Distribution of Travel Personality Categories

Travel Personality That Describes Best	Percent of Respondents	Travel Personality That Describes Least	Percent of Respondents
All Arounder	24.6	Gamer	38.8
Sight Seeker	21.6	Avid Athlete	17.1
Culture Creature	14.6	City Slicker	12.6
Family Guy	10.6	Beach Bum	9.3
Trail Trekker	9.5	Boater	8.1
History Buff	7.7	Trail Trekker	4.6
Shopping Shark	4.1	Shopping Shark	3.3
Beach Bum	3.0	Culture Creature	2.3
Gamer	2.2	History Buff	2.0
Boater	1.3	Family Guy	1.1
Avid Athlete	0.6	All Arounder	0.5
City Slicker	0.3	Sight Seeker	0.2

Slicker (12.6%). In general, the least frequently selected categories in one choice setting are the most frequently selected in the other, indicating that respondents were consistent in their choices. Several interesting choice patterns emerged from the cross-tabulation between “best” and “least applicable” travel personality. For instance, individuals who identified themselves with the Trail Trekker personality type were significantly more likely to select City Slicker, Shopping Shark, or Gamer as the least applicable travel personality than what one would expect from the overall frequency distribution of those categories. Similarly, Family Guy and Gamer seemed to be mutually exclusive categories. Other examples are Boaters describing themselves as not being Sight Seekers and Beach Bums declaring themselves as not falling into the History Buff category. These patterns intuitively make sense and suggest that many respondents were not only able to easily identify with particular travel personality categories but also were able to clearly distinguish between who they are and who they are not when they travel to Northern Indiana destinations.

Interestingly, the prevalence of the All Arounder category seems to indicate that many travelers have multifaceted personalities and pursue a diversity of

interests when they travel. The focus group results are consistent with this survey finding, indicating that individuals tend to select more than one travel personality if provided with the opportunity to do so. On average, the focus group members selected 3.9 travel personalities to describe who they are when they travel. Importantly, the All Arounder category was less frequently selected by focus group members (ranking fourth after Culture Creature, Family Guy, and Sight Seeker). This finding suggests that choosing multiple specific personality types was preferred over selecting one category that subsumes many interests. Also, the focus group participants reported that it was easier to indicate which personality type was not applicable than to select the one(s) that best describe(s) one’s travel personality. Specifically, some focus group members were hesitant when asked to pick a travel personality and stressed that their travel personalities depended on the travel situation, especially the composition of the travel party. However, all of them were quick to select the personality type they were “definitely not.” For instance, one focus group member stated: “I guess I am a Family Guy, but the only one I am really not is Avid Athlete.”

Table 3 presents the top 20 destinations visited in Northern Indiana. As can be seen, the Amish cities

Table 3
Frequency Distribution of Destinations and Travel Activities

Destinations	Percent of Respondents	Activities	Percent of Respondents
Shipshewana	41.4	Dining	65.5
Michigan City	22.2	Shopping	65.1
South Bend	20.9	Sightseeing	51.3
Nappanee	19.9	Antique shopping	39.0
Middlebury	19.2	Festival/special event	29.2
Goshen	14.3	Beach/waterfront	25.4
Merrillville	12.0	Visit historic site	24.0
Elkhart	11.7	Museum/play/concert	14.0
Chesterton	11.3	Hiking	12.4
Valparaiso	11.2	Gambling	9.5
La Porte	10.0	Bird watching	8.9
Hammond	7.8	Boating	5.9
Crown Point	7.4	Nightlife	5.8
Angola	7.1	Boat/auto/antique show	5.4
Warsaw	6.4	Hunting/fishing	5.1
Mishawaka	6.1	Golfing	3.1
Plymouth	5.4	Biking	2.8
Portage	5.4		
Lagrange	4.8		
Ft. Wayne	4.2		

of Shipshewana (41.4%) and Elkhart (41.4%) and the large regional shopping centers of Michigan City (22.2%) and South Bend (20.9%) were the most popular destinations. However, smaller Amish villages including Nappanee and cities with natural environments including Middlebury were also popular places to visit. In general, Northern Indiana visitors explored two to three cities/towns during their stay (mean = 2.5 places). The top three activities were dining (65.5%), shopping (65.1%), and sightseeing (51.3%). In addition, antique shopping, visiting a festival/special event, beach/waterfront, and historic sites were common activities of visitors to Northern Indiana. Overall, respondents participated in 4–5 and up to a maximum of 13 activities (mean = 4.4 activities).

Results of Discriminant Analyses

The second phase of the study examined the degree to which travel needs/motivations, travel styles, desired activities, desired destination features, and personal values could be used to discriminate the 12 travel personality types. Two analyses were conducted based upon the “best fitting” and “worst fitting” personality types selected by the respondents. The results of the analyses suggest that the travel personality categories are distinct with respect to their underlying travel motivations, styles, and values. Specifically, the results for the analysis using “best fitting” travel personalities indicate that 45.9% of the cases were correctly classified. Given the many categories in the grouping variable, this result is significantly better than an assignment by chance. This finding suggests that travel personality could, indeed, be a useful strategy for classification purposes and could be used as a surrogate for various psychographic variables. Interestingly, the classification result for “least applicable” travel personalities was somewhat inferior, with only 38.3% of the cases being correctly classified. Thus, although it seems to be easier for respondents to select a single “least applicable” category, these categories appear to be less distinct with respect to underlying motivations. However, the difference might be due to the fact that survey questions were worded in a positive way and that the motivations, styles, and values one has do not automatically reflect the psychographic characteristics one does not have.

Results of Correspondence Analyses

One of the most important questions to be answered within the context of a DRS is, of course, whether these travel personality categories can adequately predict the activities and/or places that might be recommended in the DRS. A correspondence analysis was first used to examine the relationship between personality types and activities. Avid Athlete and City Slicker were excluded from this analysis as few respondents had selected either one of these personality types; also, they correspond little to the offerings of the Northern Indiana region. A correspondence map was created to visually assess the degree to which the personality types and activities are associated (Fig. 3). The results indicate that the relationship between personality types and activities can be mapped into a two-dimensional space. The results are significant ($\alpha = 0.05$) and the two dimensions account for 59.2% of the inertia; adding a third dimension would not significantly improve the result. As illustrated in Figure 3, Dimension 1 is defined by Gamer and gambling on one end and History Buff and museum on the other. Thus, Dimension 1 appears to reflect travel motives ranging from the desire to escape to engaging in learning while on vacation. Dimension 2 contrasts natural with man-made or constructed settings and is defined by Trail Trekker and hiking versus Culture Creature and museum.

The results reveal a close correspondence between travel personalities and respective activities. For instance, Boater and boating map almost perfectly onto each other, as do Sight Seeker and sightseeing. However, most travel personalities are related to more than one activity. For example, Culture Creatures seem to enjoy festivals and museums, as well as historic sites, and Shopping Sharks engage in shopping but also nightlife and dining. As expected, the All Arounder personality is surrounded by many different activities. Similarly, the Family Guy personality seems to map onto several kinds of activities, but is definitely not related to gambling or hunting/fishing as well as biking.

A second correspondence analysis was conducted to directly assess the relationship between the personality types and the destinations visited in Northern Indiana. Interestingly, no significant relationship was found between travel personalities and travel

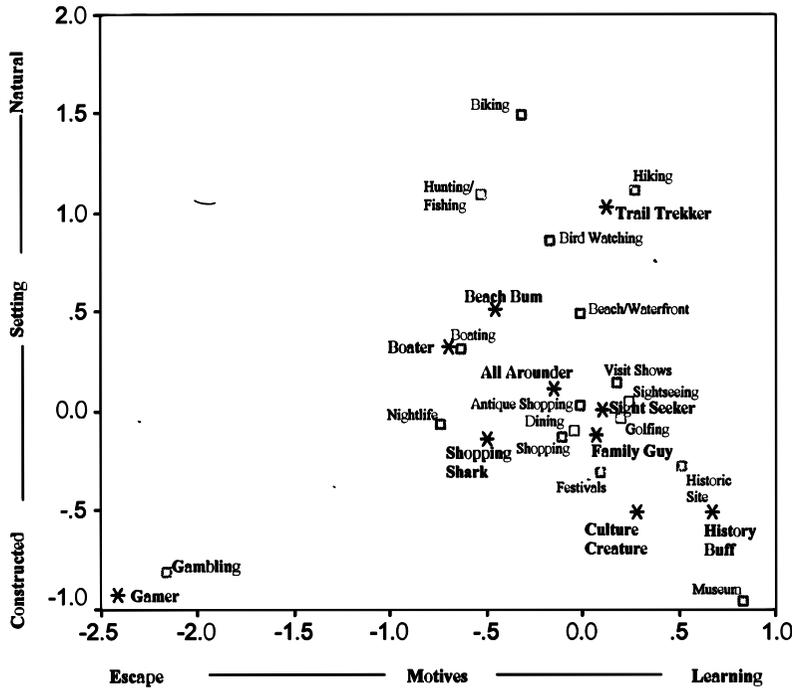


Figure 3. Relationship between travel personality and travel activities.

destinations. It seems that many destinations in the Northern Indiana area offer a diversity of tourism products, thus catering to a variety of tourists. Also, they are, in comparison to each other, rather homogeneous. Further, certain destinations are very popular (e.g., Shipshewana) and are visited by many of the tourists who travel to the area (more than 41% of the survey respondents say they visited Shipshewana on their most recent trip to the Northern Indiana area). Although not significant, certain relationships are clear and consistent with a priori expectations; for example, the Boater personality is more closely related to destinations near Lake Michigan. In contrast, History Buffs seem to frequently visit destinations such as Warsaw, where a number of museums can be visited, as well as Nappanee, which has a historic and cultural center that explains the Amish way of life to visitors.

Conclusions

The findings of this study suggest that travel personality categories can serve not only as a fun way

to engage users in the recommendation process but, importantly, as a useful tool in a DRS to easily capture differences among users with respect to their preference for certain activities. The categories used in this study appear to be quite distinct in terms of underlying psychographic variables but not as different with respect to actual travel behavior. This could be seen as a potential problem for the design of the recommendation algorithm. However, from a marketing point of view, being able to suggest more than one destination can be seen as an advantage. Also, it is expected that there would be more variation in the data and consequently less ambiguous assignments if the travel personality approach was tested in the context of a less homogeneous area (e.g., destinations throughout a state, province, or country). For tourism regions with similar destinations, activities can serve as an efficient route for recommending potential places to visit.

The results further indicate that specific system design decisions, such as deciding whether the user is allowed to check more than one personality type and/or whether users can exclude certain types, are

all but trivial. Drawing on existing decision science and usability literatures, further research is needed to investigate the implications of multiple choice settings and “exclude” options in the context of recommendation systems. In addition, the research presented in this article did not specifically address the effects of the way in which the personality types are represented (e.g., in text or pictorial form or a combination thereof). This appears to be an area in need of further exploration as the ultimate goal of such a category approach is to provide users with the necessary cues for being able to quickly identify with or discard certain options.

The identified relationships between personality categories and activities participated in while on vacation look very promising. It is suggested that a simulation approach that compares predictions based on personality types to assignments based simply on probabilities derived from the frequency distribution of the activities could further enhance our understanding of the predictive power of category-based approaches. Also, although the mail survey used in this study provides some opportunities for comparing information derived from questions to user information derived from choices among predetermined categories, there is still a need for a more direct comparison of the two approaches in an actual DRS setting.

The increasing frequency with which category-based approaches appear on general consumer product as well as tourism-related Web sites indicates that marketers see a need for innovative ways of customizing their offerings without forcing the user through lengthy registration–assessment processes or requiring a rich inventory of past search and/or purchasing behavior. Personality types draw on users’ needs for self-expression and personalization without imposing many constraints in terms of effort and time. In addition, they are fun to use and allow users to quickly revise their specifications if the recommendations did not match their interests. Thus, they point out that the ultimate goal of recommendation system design is not necessarily to find the most precise matching algorithms, but rather to simplify the decision-making process by offering a reasonable subset of alternatives. In addition, successful system design efforts need to focus on creating meaningful user experiences.

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Conceptualization of a Global Trip Planning Recommender System for Tourism Recommender Systems

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Abstract

In the course of a travel planning process tourists are facing a complex information search and decision making process. The Internet, an ideal medium for information collection and processing, offers a wide range of tools to support this process. In many cases the main problem is to find an informative web page which provides information appropriate for a certain decision stage. Quo Vadis, an intelligent recommendation system described in this paper, is designed to guide travellers in different stages of the decision process in order to find the best matching web site. Its fundamental principles are a description and categorization of travel web sites to connect this with the user database at a later moment, user dialogue and a learning algorithm. In this paper an approach for categorizing travel web sites is described, as well as a following evaluation process.

Keywords: recommendation system, Internet, categorization of travel web sites

1 Introduction

The information search and decision making of travel planning is a complex process for consumers. [Fodness and Murray 1999, Jeng and Fesenmaier 1999]. "Recent developments in consumer research seem to support a concept that travel choice and decision making behavior is a temporal, dynamic, successive and multi-stage contingent process in which certain decisions made in an earlier stage will condition decisions made in a later stage" (Jeng and Fesenmaier 1999: 134). For example the decision concerning the destination determines the type of transportation and accommodation. Budget restrictions and availability can lead to different modifications in already made decisions.

It is possible to distinguish different stages of the decision process (Figure 1), the problem identification, information searching, information evaluation, choice and post choice stage [Moutinho 1987]. The requested information during this process differs substantially.

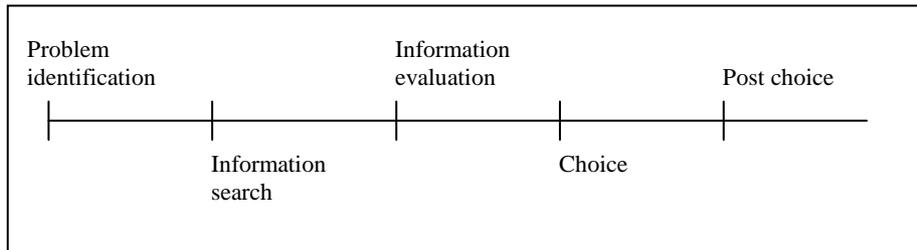


Fig. 1: Decision process

The Internet seems to be an ideal medium to cover all the different needs of the travellers. But the wide range of information often incurs difficulties in finding an optimal way to support the individual needs of travellers. Different Travel sites cover different areas in the travel industry with distinctive and overlapping information. The first web sites were developed on the basis the information available. Another generation of web sites moved their former reservation services to the Internet (like Worldspan). The further development of these sites and the competition in this area lead from a supplier oriented to more consumer oriented development. This process can be compared with the development in marketing, compare several introduction sections of marketing textbooks (Kotler 2001, Meffert 2000).

The possibilities to offer all the requested information in one decision support system managed by one web site are restricted by the availability of databases and the amount of information which can be stored and maintained in a system. Considering the World Wide Web as one giant data repertory, it seems attractive to simply rely on this existing knowledge base, and instead of recommending a particular tourism product, the traveller is guided to the most useful web page or travel information system.

Different recommendation systems try to use existing knowledge to support their users with better personalised information. Amazon.com is one of the most cited examples of an intelligent solution on the Internet. It recommends books, movies and music on the preferences of other customers. MSN music "mood station" finds the adequate music to the users mood [music.windowsmedia.msn.com/discover/]. In the tourism field TripleHop Technologies' TripMatcher predicts user's interests through a combination of content filtering, attribute-based collaborative filtering and click-stream analysis. Ski-Europe "Where should I go?" [www.ski-europe.com] and EuroVacations' Destination Wizard [www.eurovacations.com] are first applications in the tourism field. Although these systems are working examples for intelligent applications in the tourism fields, they are restricted to their own databases.

2 Quo Vadis

Search engines like Yahoo! and Alta Vista [Ansari et al. 2000] already use customer supplied keywords to recommend relevant documents, but they do not reduce the variety of the results. Even within the listed categories of the search engines a wide range of offered web sites exists. This high variability and complexity causes much

confusion among travellers [Pan and Fesenmaier 2001]. One site offers flight bookings only, another site covers package trips, the next site promises the cheapest hotel or all important dive places in Europe. All these sites fulfil only some travelers needs at certain conditions. Quo Vadis is designed to assist the traveller in all different stages of the travel decision process and to guide him/her to the best matching site. Depending on the phase of the travel decision process, his/her individual interests and the experiences of other users with similar profiles the system finally recommends a list of web sites or search engines.

2.1 System Design

In principle, the system consists of two main databases, a web site and a user database. The web site database is a link collection of different travel web sites and their description. This description is generated through an evaluation, which provides detailed information about the content available on the site. Information captured by the survey is: languages, destinations, regions, means of transportation, accommodation, supported phase of the decision process and special interests covered by the context of the web site. The categories are based on the typology of tourism-related web sites and the hierarchical structure of travel/tourism classification of online portals [Pan and Fesenmaier 2001]. Information concerning links to similar web sites is used in the recommendation process as well as in a validation process of the classification of a web site. A detailed system design is illustrated in Figure 2.

The user interface is created at runtime from a set of questions stored in the database. The questions are based on existing knowledge about traveler's choice behavior. Knowledge about the stages of the decision making process, different interests (e.g. diving, skiing, jazz music) destination preferences or individual user profile information (e.g. age, family trip) is used for the recommendation process. The hierarchical concept of the decision process [Jeng 1999] is also considered. Already made decisions/choices are considered for the ongoing questions. The more questions the user is willing to answer the more detailed and better the results. The dialog between the user and the system can be stopped and resumed at any time by the user. By means of the user's response on the questions a user profile is created, stored in a user database, and considered for the assembling of the user interface in future sessions.

The matching results are listed in rank order and accompanied by a short description of the page. Click-stream analysis together with online feedback from the customer provides information on the quality of the recommendation. This information is later used for the optimization of the recommendation part of the system.

The strong customer orientation of Quo Vadis should provide a more universal way through the decision process than traditional systems. Although it is designed for the recommendations for trip planning, the comprehensive collection of consumer data, click-streams, log-files and evaluation data in combination with the ongoing learning process will also present a useful source of information for future research in travel consumer behavior.

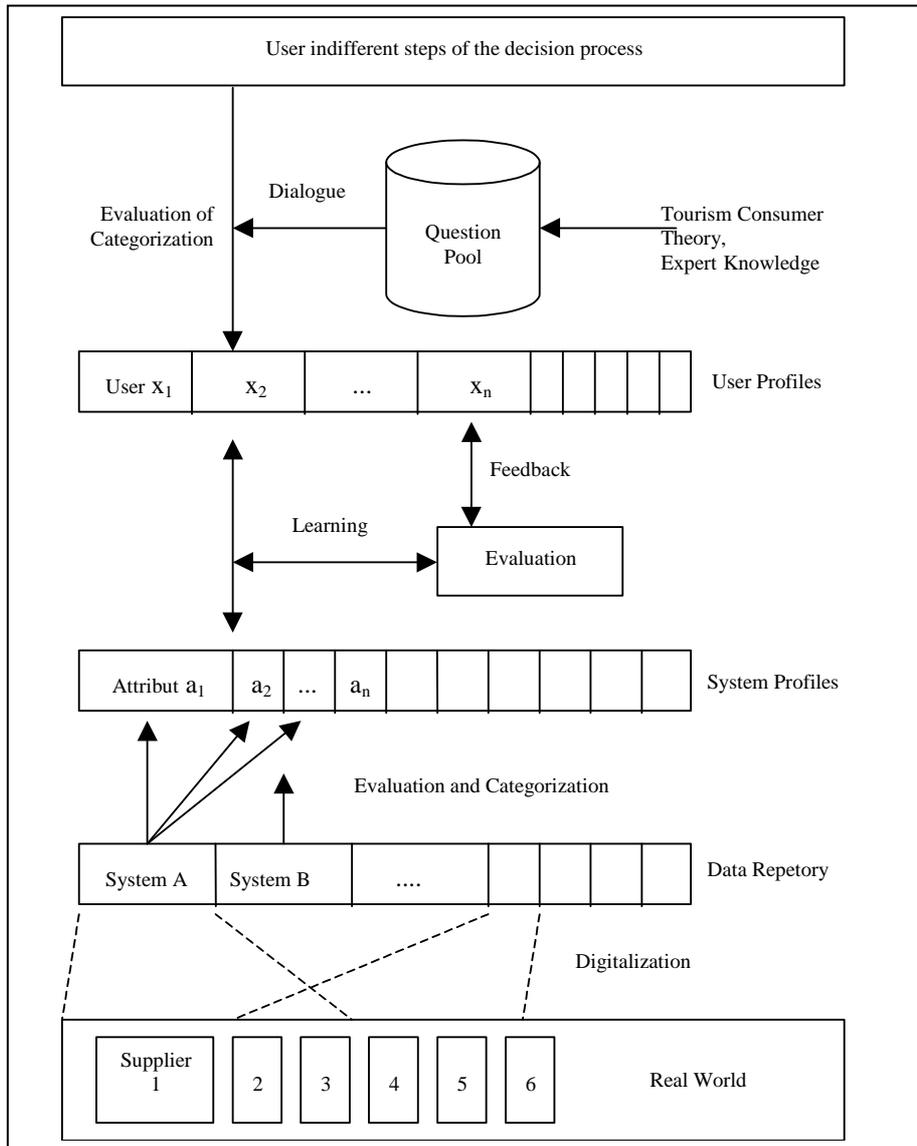


Fig. 2: Quo Vadis: System Design

2.2 Classification of Travel Web Sites

An optimal and extensive description and classification of travel web sites is one of the most important parts in designing a recommendation system for other recommendation systems. Information on scope, content etc. of the recommended web sites makes the linking process between the web site and the user databases more effective. One way to do the classification is using already existing knowledge. This

knowledge is available on the web site itself, travel directories and of course from research.

The way to find important criteria's describing the web sites can be divided in three stages. First evaluation and description of the 28 travel web sites is performed for the development of the prototype. The second stage summarizes classifications of travel sections from the important search engines. This information and knowledge about the travel decision process leads to the third stage, which gives an overview and a first recommendation how to classify the web sites.

2.2.1 Description of the evaluation process of travel web sites and travel directories

Quo Vadis allows adding web sites easily by a simple classifying questionnaire. For an initial solution different travel web sites are selected randomly, but with respect on different subjects (outgoing, specialization, incoming), size (international, regional). Sites which seemed to be too similar, will be eliminated from the sample. In the end 28 web sites were used for the evaluation process. The process starts with a description of the web sites. Contents and features are listed, as well as subcategories, available databases, search queries, special features and additional tools. Design quality, efficiency and usability of the web sites is not considered for the assessment of the recommendation system profiles. Although these has effects on usage, in this case objective characteristics of the content are important only.

Travel directories are a further information source of classification criteria's. Most of the main search engines offer additionally to their search function, the possibility to browse through classification trees. These trees reference to sub trees more than once and in different main categories, which makes the analysis more complex. Further travel directories offer travel specific classifications. In this case seven of the main travel directories (Mi-Travel, Travigator, TourWorld, imOutdoors, AllTavelDirectory, Hospitality-Industry, TravelHub), three of the main search engines sub trees "travel" (Google, AltaVista, Netscape) and the classification tree of the travel web portal (virtualtourist.com) were analyzed (For example see Figure 3).

Information provided in the sub trees of travel directories is not only related to the travel decision process. They also offer information about tourism education, travel journals, books, shopping and additional information which is more or less close to travelling in general. This part was omitted, due to the narrow focus of travel web sites. All results have already been described in the way of the later questionnaire.



Figure 3: <http://directory.google.com/Top/Recreation/Travel>

2.2.2 Questionnaire

The questionnaire is divided in different parts. In the first part general information about the web site can be found, the second part specializes on available databases and their search queries and the third part contains more further information, for example about the trip, booking possibilities and other services. The last section consists of an open text space for a short description of the web site (max. 400 characters, about 5 lines). This information is provided by the query result list of the system later on. Multiple Responses are handled for most of the variables, excluding main / first priorities and some excluding information.

The first part about the *general information* includes information on the main (first) and on further available languages, general purpose of the web site (information, booking possibilities, search possibilities), as well as available databases and their related search possibilities (packages, hotels, flights, car rentals). A general description of the web site (international travel site outgoing, national travel page outgoing, national travel page incoming, regional travel page incoming, product page) is also mentioned in this part, as well as information about the organization maintaining the web site (travel agency, NTO, RTO, airlines, travel industry organization, travel portal companies, etc.), the supported decision process stages (information search, information evaluation, choice, post choice). The supported decision process is a subjective judgment made by the evaluator of the web site, which is considered to be useful for recommending informative web sites at the given decision stage. The whole section is shown as an example in Figure 4.



Quo Vadis
Recommender System for Tourism Recommender Systems

ADD TRAVEL WEB SITE
(Page 1 / 3)

General description of web site

Name of web site:

Address of web site: http://

General description of web site:

Main (first) purpose of site:

Further general purposes of site: (no/multiple response possible)

Organization maintaining web site:

Main (first) language:

Further languages: (no/multiple response possible)

Available databases:

Packages	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input checked="" type="radio"/> 5	Scale: 0 ...does not exists 1 ...very small database : 5 ...exists, very large database
Hotels	<input checked="" type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	
Flights	<input type="radio"/> 0	<input type="radio"/> 1	<input checked="" type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	
Car Rentals	<input type="radio"/> 0	<input checked="" type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	
Supported Decision stages							
Information Search	<input type="radio"/> 0	<input type="radio"/> 1	<input checked="" type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	
Information evaluation	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input checked="" type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	
Choice	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input checked="" type="radio"/> 5	
Post Choice	<input type="radio"/> 0	<input type="radio"/> 1	<input checked="" type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	

Fig. 4. Quo Vadis: Add Travel Web Site, Example

A more detailed evaluation of the possible *search queries* is described in the second part. *Flight search queries* use information about persons travelling (family, single, children, age), departure cities, departure time (date, time, flexibility - one, two more days up or down), preferred airlines, type of trip (round trip, one-way, multiple destination). Information about special options (nonstop flight, consideration of miles collection, etc.) is given as well. *Car rental search queries* handle pick-up location, duration of stay (date, time, flexibility), car class, rental company (one, two, more) and special options.

The *accommodation search queries* are more complex and variable. That is why the main search criteria (destination, location, kind of accommodation, price) should be mentioned as separate questions. More questions about type of accommodation (hotels, apartment, camping, bed and breakfast), category of accommodation (1*, 2* ...), location (search by map), price, duration of stay (date, time, flexibility).

Packages search queries overlap with flight and accommodation search queries, for that this information will not be asked twice. In each category of search queries it will be asked for availability check and booking possibility. A list of the most common

special offers will be added as well, other not mentioned offers are part of the "short description" in the questionnaire.

The third part consists of *more detailed and further general questions* offered by the site. This section includes information on booking possibilities (online, mail, phone, fax.), transportation (bicycle, bus, car, motorbike, airplane, ship, rail), place of departure country/city and destination (name of country, no regions, ill-structured regions, semi-structured regions, detailed regions). The country selection is made from continents to regions and is formalized as a multiple response question. If necessary an additional open text field offers the possibility to give detailed regional information. In this case the country selection process in general will be skipped, except the relating country information.

Other important questions are the general type of a trip (city trips, last minute, packages, individual, special offers), special types of trips (adventure travel, culinary travel, eco-tourism, educational travel, religious Travel, etc.), special types of travelers (business, disabled, family, gay&lesbian, honeymoon, traveling with pets, etc.) and special activities (art, camping, swimming and sunbathing, amusement parks, etc.), natural environment (sea, mountains, lake, etc.) and season (winter, summer, spring, autumn). This section has to be evaluated more accurate than others because it is hypothesized to have substantial influence on the learning environment. Needed information concerning these questions is not obviously available on the web site, so the evaluation process has to be as comprehensive as possible. This can be supported by additional evaluation guide lines.

Further information about the web site is collected on the availability of personalization features (my profile, membership, save functions), general destination information (weather, custom requirements, health, safety, addresses), special destination guides/information (sights, restaurants, activities, tickets), services (currency converter, insurance, airport service, about us), route planners, special offers, and other services (greeting cards, message boards, user reports, expert advice, FAQ, etc.).

2.2.3 Summary and Conclusion

A different approach is needed due to limitations of existing systems and travel web sites in supporting the whole traveler's decision process. Although search engines and travel directories offer a wide range of support they do not give attention to the detailed traveler's requests either. Quo Vadis is designed to fill up the gap between single travel web sites and the search engines and travel directories.

Still some points are left unclear, for example the discussion on fixed or variable system profiles. The advantage of variability is an ongoing adaptation process, fixed profiles are easier to handle and need less resources. There are still more open

question in this topic, also concerning the two main topics, the learning environment and the user interface. Forthcoming research has to focus especially on these topics. Further research initiatives concentrate on the evaluation of the classification concept. For this purpose more than five hundred travel web sites are examined and analyzed. The data set will be analyzed on unnecessary variables and within the open section on missing classifications. The excluding analysis deals with descriptive statistics, e.g. if the frequency of several variables has no deviation, which means always the same possibility is selected. It deals with advanced analysis, like factor analysis, which purpose is to reduce and find structures in data. The text in the open section will be screened for missing variables, and it can be used for a review of the classification as well. Then the resulting classification is required for developing the user interface. In an ongoing process the user interfaces will be adapted together with the development of the learning algorithm.

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Personalised Travel Counselling System – Providing Decision Support Features for Travellers.

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Abstract

The purpose of this paper is to present a model of an intelligent personalised travel counselling system. An Attribute and a subject based approaches are presented in this paper. The first approach starts with a questionnaire about the user and his/her preferences to suggest the first version of the travel plan. The latter approach omits any questions to the user and starts with a randomised suggestion. The strengths and weaknesses of these approaches are considered and addressed in the proposed travel counselling system.

Keywords: Internet/World Wide Web, travel counselling system, adaptive systems.

Introduction

As the Internet becomes more and more important for tourist decision making, the problem of how to find and use information for their travel planning has not become much easier. In the initial phase of travel planning when someone has not decided on a specific destination, destination management information systems as well as many travel counselling systems do not offer the wide range of alternative products/destinations one would expect. On the other hand, when one is more advanced in the decision making process, he/she frequently does not find information up-to-date and detailed enough information for establishing a particular travel plan [1].

During the course of the decision making process the interest of a tourist becomes more detailed and personalised. For example, in the case of a city traveller, who has decided which city he/she will visit, this may not only include questions about transportation, accommodation, and special events which will take place during his/her stay, but also detailed information about shopping hours, location of attractions, distances from the hotel, transportation facilities, entrance fees, dining out possibilities etc. To examine the decision making process Knippenberg, cited in Jeng [2] defines three phases:

- Pre-search
- After search, and
- After choice

This work concentrates on the after choice process, especially after the reservation process. But of course it can also be used as an additional instrument in decision process at an earlier time, as well as, if technically possible, during the travel itself. An personal adapted travel plan with actual information should guide tourists during their visit. One of the main objectives of the paper is to propose a model for an intelligent counselling system for the after choice phase of the decision process. A detailed travel plan consisting of various tourism products is offered for a specific destination. It creates an individual package (travel plan) for tourists which is optimised by time and budget constraints, and includes information restrictions about shopping hours, attraction opening hours, entrance fees, sport and cultural events and dining out opportunities. The overall objective of this tool is to support tourists with personally customised information, to make their trip more special and to enhance their intention to revisit.

Existing Tools

In principle, travel web sites should offer all the information needed for user's satisfaction during the decision process. Originally some systems have been developed with a strong focus on consumer needs. But, because it is not possible to support all decision process stages well, they tend to concentrate on different combinations and have grown naturally. For example, Netscape Travel [6] offers a destination support system, the Netscape Travel Guide as well as additional information about destinations, a reservation system and further links. Other examples including Expedia [7], Sabre [8] or Getting.Here.com [9] provide advanced interactive, travel booking services for (mainly frequent business) travellers. Biztravel.com [10] has an additional tool which enables fares, accurate travel booking optimised around traveller's preferences for airlines, hotels and rental cars; additional information about destination is supported on most of the web sites, but there is no systematical support during the after choice phase.

A number of travel web sites have been developed for travel agencies or airlines as a reservation tool. These are specialised in reservation systems like Worldspan, who develops and provides travel suppliers with electronic distribution capabilities. They moved their former airline technology service to the Internet [11] but also have strategic alliances with customer oriented sites such as "My Trip and More", where customers can have a look at their booked flights, tours, accommodations or car rentals in a very detailed form [12].

A number of smaller projects focus on personal travel decision problems and include more complex information. For example, Triplehop Technologies [13], who provides the vacation advisor "Follow the rabbit" [14], uses a combination of five levels of filtering: content-based, event based, collaborative, context-based and location-based filtering. The Matching Engine considers only user relevant data to provide recommendations that closely match user's preferences.

One of the first prototypes of an intelligent computer-assisted travel counselling system was designed by Hruschka/Mazanec [15]. It was consumer (traveller) oriented and, as the Internet did not exist at that time, not directly accessible for tourists. Another well known framework for computer-assisted travel counselling (CATC) was proposed by Loban. The system is designed for tour packages, and assists tourists in an early decision stage [16]. Another similar system in this context is CABATA, developed by Lenz [17, 18], which is an example of application of case-based reasoning. The application is already designed for Internet use. MaTourA, developed in Greece, is a multi-agent tourist advisory system, which provides an interactive way to construct personalised tours [19]. The advice system developed by Vanhoof/Molderez [20] uses the link through the travel agent, who is the mediate user of the system. Low et al. developed an expert system for tour advisory which they called ANESTA [21]. This system uses tourist requirements and preferences, but it did not consider any information about the tourist himself. The first purpose of ANESTA is an automated tourist information centre, the second one, a tour schedule advisory system.

Another interesting tourism web counselling tool in this context is TourBO [22, 23], (Online Regional Tourism Consulting System), a system developed at the Bavarian Research Centre for Knowledge-based Systems. The prototype, applied to a city tourism case study, includes an electronic diary, which can be modified by the user. The system uses the concept of stereotypes to give better suggestions. The whole project is more complex, supports additional information about the points of interest, maps and provides a communication platform for users, a personal adapted newsletter, as well as a leisure partner service.

One different approach in the context of complex trip planning which does not rely on artificial intelligence was presented by Godart [24]. This trip planning problem uses and adapts combinatorial optimisation tools on the base of the "Travelling Salesman Problem". Transportation, lodging and activity comprise the categories/components of the tour. The aim of this decision support system is to "help users to select and combine the most appropriate tourism products, considering a tourist's values, wishes and constraints"[24:319].

The Counselling System Layout

A model for an intelligent counselling system is proposed which offers a detailed

travel plan consisting of various tourism products offered by a specific destination. It creates an individual package (travel plan) for tourists which is optimised by time and budget constraints, and includes information restrictions about shopping hours, attraction opening hours, entrance fees, sport and cultural events and dining out opportunities. Such a travel plan with up-to-date information can be used as a guide during the trip. Before the trip, it is used like a travel book, to read more about the chosen destination. By means of additional links, this system gives more detailed information about the chosen points of interest. Because of the individual adapted trip layout, tourists in the end should be more confident than with a standardised plan.

There are two different approaches that can be followed and offer the starting point for system development. The attribute-based, or traditional approach, uses filters to come make an initial suggestion of the travel plan. The second one strategy (subject-based) starts with a randomised solution. These two approaches are considered below.

Attribute-based Approach

An attribute-based approach consists of a short on-line questionnaire where attributes about the tourist are collected. It contains questions about age, sex, country of origin, number of accompanying persons, date and time of arrival and departure, budget constraints as well as special interests (Sports, Music, Theatre etc.). Using this information the system generates a time table, with a list of recommended points of interests for the personal profile of the tourist. The points of interests are listed with information about location, estimated and recommended average duration of stay and if necessary, entrance fee. Additional detailed information including photos can be seen by clicking on a linked page, which is provided by the system or the point of interest itself. The system optimises the time table by time and location and suggests different routes within the public transportation system.

Optimising only the time table is not the main goal. The first version of the time table may not be the best solution for the user. Therefore, it is possible to change to alternatives as long as he/she stay within the solution space defined by the constraints. The rejection process includes a question why the user is looking for alternatives. Is it just because it isn't within his interests? Or, is it too expensive? Or, are there other reasons? These questions are important because they are needed to support the learning process for the system whereby it classifies user characteristics and behaviour, stores, analysis and learns from it in order to provide a better service in the future.

Subject-based Approach

The second approach considered in this research project is stochastic in nature and does not requires any questions for the user. The system starts with a randomised time table, which is basically the same as in the previous questionnaire-based version. The only information which needs to be entered by the user is the length of the trip. All

the features and handling of the system are the same like in the previous system including the learning process.

System Architecture

The proposed systems consist of two main databases. In the user database, which is needed for the attribute-based approach, information about sociological attributes of the user (like age, sex) and personal preferences (interests, budget and time constraints.) are saved. The attraction database consists of all the attractions (sights, hotels, event locations) and their related information (attraction description, opening hours, location, prices). But the attractions are also related to the rejection process and the user decisions (attraction weights). The final decision is be made with a print or save button. The database structure how it is linked to the user database is shown in the figure below.

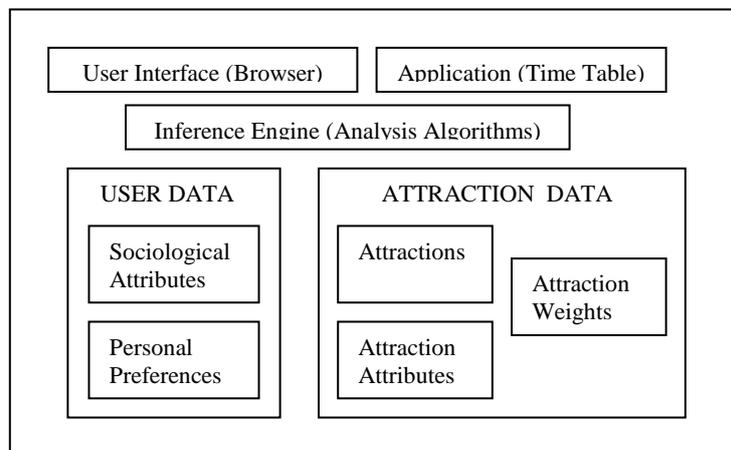


Fig. 1: Adaptive web information system [25]

Concerning the application of intelligent systems it is important to consider a correct modelling of the desired features with the well-thought-out combination of artificial intelligence techniques, and not focusing the techniques themselves [26]. The communication with the user, as well as the administrator of the attraction database can be handled through a web browser.

Summary and Research Questions

The main research question raised focuses attention on two different travel counselling approaches: (1) the attribute- based approach and, (2) the subject-based approach. In

particular, this study considers which is superior in terms of usability, speed, adaptability or user acceptance.

The advantage of the attribute-based approach is a better starting solution, which depends on the filters and the clustering of the users. A better starting point should make it easier and faster to reach an optimal solution. On the other hand, the clicking and answering behaviour of Internet users have to be considered. They are sometimes reluctant to answer too many questions about their personality, particularly in the Internet user want to stay anonymous. Time relevance seems to differ in the Internet from real world time. A system which does not use interviews/questions in the beginning should be more attractive to users and invite them to stay.

However, there are a number of concerns. In particular, does the subject-based approach generate enough to come up with optimal solutions within a certain period of time? Is it possible to get a satisfying suggestion for a time table or does the users give up earlier? What the pros and contras of the two systems when it comes to integrate additional constraints set up by suppliers and tourism organisations (e.g., price limits; travel flow controls etc.)? To answer these questions it is necessary to test the two models in real world environment. After the final decision the user will also be asked to answer few questions about the system to help the designers to improve the system. Questions about the usability and additional remarks of the systems will be asked. For validation of the efficiency of the two approaches, the server log-file will be compared. Protocols from users who do not finished the planning process can not be answered. To save some of their opinions an additional feature for feedback is added. Findings of this study will provide a greater understanding of the changing information collection process of tourists and help in developing more intelligent travel planning systems on the Internet.

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5 To investigate different search patterns, strategies and keywords within the online search process in the destination context

Mitsche, N. 'Understanding the Information Search Process within a Tourism Domain-specific Search Engine', in: Frew, A. (2005) *Information Technologies in Tourism 2005*, Springer Vienna. 183-193.

Best Paper Award, also published as book chapter.

5.1 Background & Innovation

Search engines have been and continue to be one of the major starting points in the holiday decision making process (eMarketer, 2015; Ipsos MediaCT, 2014). It is thus essential for destinations and holiday providers to understand how travellers search online, what their starting points are and how they change their queries throughout the search process (Mitsche, 2005) as the identification of such patterns could support search engine marketing (SEM) strategies for destination and businesses (Xiang and Pan, 2011).

Early research highlighted that users are searching the Internet in a simplistic format by submitting only a few queries, most of the time using only one keyword, and where features such as relevance feedback ("more like this") and Boolean operators are hardly used or used in mistaken form (Jansen et al., 2000).

The advancement of technology has enabled the development of more sophisticated and intelligent search engines. Search engines are now able to utilise more than one search engine (Metasearch, 2015), cluster search results by the most important keywords (Yippy, 2015), search by images or provide a graphic overview of the results (Quintura, 2015), or social search engines where people are answering questions (Chacha, 2015). More importantly various intelligent features have been added within search engines, such as the identification of spelling mistakes or to suggest an improved keyword search (Liu et al., 2006).

Nevertheless, the simplicity and repetitive use of the same keywords in users' searches continues to be a main feature (Mitsche, 2005; Xiang and Pan, 2011), and appears to be mirrored in the way we use mobile applications (Friedman, 2015). Various search engines with different approaches to searches have seized to exist, as the simple word search appears to be still the most selected way of users to search for information.

There is a common pattern of main keywords searched for such as hotels and events which highlight the core requirements of tourists during their travel based on the multi-faceted travel decision process (Mitsche, 2005; Xiang and Pan, 2011). Variation can be found depending on the size of destinations as more requirements such as transport systems and maps are added (Xiang and Pan, 2011). There is also a variation in keywords depending on the familiarity and the knowledge on the destination. Searches with higher familiarity appear to be more specific towards the destination (Spink, 2002; Wöber, 2007b; Xiang and Pan, 2011; Xie, 2002). Although some studies have investigated the long tail of keywords by users and suggested they might be useful for search engine optimisation in the destination context (Pan, 2015; Pan and Li, 2011), others have found the long tail less important and suggested to refer to the (changing) 100 most important keywords instead (Skiera et al., 2010).

Search engine marketing is one of the strategic tools to try and win prospective travellers' attention in the competitive online environment (Xiang and Pan, 2011). Search engines are the first step into persuading travellers to visit a destination, and visibility (Xiang et al., 2008), and have a significant impact on those first impressions and subsequently the overall evaluation (Kim and Fesenmaier, 2008), building up visitors' expectations. As such, it is important for destinations to appear high up in the ranking within search engines (Bauernfeind and Mitsche, 2008; Pan, 2015).

The focus of this paper is an analysis of different search strategies, patterns and keywords prior to booking in the destination context. The keyword repertoire provides an insight into tourists' information search patterns, as does the browsing on the site itself. This research is based on data log files

from the European Cities Marketing web site Visiteuropeancities.info. It investigated the search pattern to understand the pathways visitors take during their search, and aimed to cluster those pathways and at the same time cluster the keywords at the starting point of the search.

5.2 Methodology

The data analysed has been collected via a web crawler and provides a snapshot of all searches conducted on the Visit European Cities web site within a month (September 2003). As such, it provides insights into what exactly potential tourists are looking for, how they navigate through their search, and to identify possible types of searchers. Previous studies (He et al., 2002; Spink, 2002) have highlighted a simplicity of keywords used and a simplicity in the search itself as well as a repetitive nature. No studies at this point have been looked at the destination context and tried to identify different types of searchers or qualitatively analysed the keywords. More recent studies in the general search engine context (Skiera et al., 2010; Xiang and Pan, 2011) have confirmed the continuous simplicity and expanded results on the slight differences in keywords used depending on prior knowledge (Spink, 2002; Wöber, 2007b; Xiang and Pan, 2011) and the size of the destination.

Users within the Visiteuropeancities.info web site were able to search for data on the partner cities web sites and could specify to either select on one city or search on all partner cities. The log file recorded the time of task, IP address, language, city code if the search conducted referred to a particular city, search keywords, and the kind of task executed as well as information about the count of links in the results list, and a code for external city web homepages. The original log file data has then been prepared for statistical analysis with the aim of identifying the most important keywords and identify patterns of search patterns. This meant to transform the task based log file to a data set which entities were the search itself containing more than one task independent if the task had been completed or not.

To provide more depth to the analysis the keywords used within open text query were manually recoded using content analysis in various groups such as tourism topics or specialised and general keywords. The outcomes of the recoding process were additional variables which enabled a quantitative analysis of this original qualitative information (Auer-Srnka and Koeszegi, 2007).

The data was then analysed using the statistical package SPSS. The first step descriptive analysis such as frequencies and cross-tabulations including chi-square tests examined first patterns of keywords groups within general and city specific searches of the site. This was to investigate further the impact of how far evolved the user was in their search process and their search behaviour (Sawasdichai and Poggenpohl, 2002; Xie, 2002).

Cluster analysis was applied to discover search patterns. Cluster analysis is as a multivariate method which allows the identification of groups within data, on this occasion grouping search patterns together by grouping those patterns which are most similar (Hair et al., 2014). Discriminant analysis was used to validate those patterns, through its ability to predict group membership (Hair et al., 2014) and comparing it with the actual results from the cluster analysis.

5.3 Findings & Contribution

The findings highlighted the simplicity of the search patterns and keywords used and the number of searches itself, something which is still replicated how we search today (Pan, 2015) and how we use other forms of technologies such as mobile phone applications (Parchisanu, 2015). The keywords replicate the major needs of tourist in the search process (Xiang and Gretzel, 2010). Results further highlighted the importance in first impressions (Kim and Fesenmaier, 2008) through the important role which the homepage plays in starting and re-starting further search queries independent from the success rate of tasks. Users also try and prefer different strategies in search, using open text search and categorical search opportunities. They also like to be inspired by using the inspirational

suggestion and accessing further support options on the site, highlighting the versatility of search (Ho et al., 2012) and that the search processes are a learning and knowledge gathering activity (Morville and Callender, 2010) which is part of the experience of booking a holiday (Fodness and Murray, 1999).

The paper contributed to a deeper understanding of prospective travellers' online search patterns, strategies and keywords in the destination context by providing

- The first analysis of search patterns in the (Tourism) destination context
- Understanding of initial use of keywords within the search
- Highlights the importance of first impressions and importance of the home page as a starting point
- Highlights the impatience in search behaviour with its simplicity and limited number of searches
- Analysed specific destination related search patterns

5.4 Summary & Response to Objective

The main research objective was to examine different search patterns, strategies and keywords within the online search process in the destination context. The research outcomes provide a good overview of the online search behaviour of prospective travellers in the destination context. They enable destinations to draw conclusions in improving their visibility within search engines and support their search engine optimisation marketing strategies.

5.5 Paper

Mitsche, N., 2005. Understanding the Information Search Process within a Tourism Domain-specific Search Engine, in: Frew, D.A.J. (Ed.), Information and Communication Technologies in Tourism 2005. Springer Vienna. 183–193.

Understanding the information search process within a tourism domain-specific search engine.

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Abstract

Information search is one of the most common tasks users are performing on the Internet. Especially search engines provide tools to support the user's search process. Continuous improvement of the search engine to provide better results for users is a constant goal. But to do this it's also important understanding the users and their search patterns as well as their needs. This paper gives an overview on different information search patterns within the domain-specific search engine visiteuropeancities.com and implications of the results.

Keywords: information search; web search, search engine

1 Introduction

Understanding the information search process of web users is a key issue for new developments in supporting travellers in their search and decision process on the World Wide Web. But it is also a key factor for further improvements and discovering new directions of (travel) search engines. Independent from the success of the search process, whether the user makes a decision or not, it is generally important to understand the user's search behaviour during the use of the search engine. The question of how users start their search seems from a particular interest. The user has many different possibilities to search. He can browse through web sites, use open text queries as well as categories. Which of them does he prefer at the beginning and which strategies do follow? Are there combination possibilities of different search strategies? Furthermore the question can be asked, which keywords he uses and how general, specialised and complex are they? How do the keywords develop during the search process?

Visiteuropeancities.info offers a portal to the official web sites of 281 major European city destinations (Wöber 2003). The portal run by European City Tourism (ECT) does not only provide links to the official web sites, but is also a domain-specific search engine which enables the user to search through all the web sites provided. Because of the implication of these different search strategy possibilities within a single search engine it's not only possible to use log file data for improvements on the portal itself, but as well understand more about the users search strategies and patterns on the web.

The aim of this paper is to investigate different search patterns of user's and the adoption of different search strategies. Equally it examines the keywords used at the beginning of the search and structures them for a better understanding. The paper starts with a background of information search patterns of travellers and Internet users. After introducing the methodologies used the result section describes then the outcome of the conducted analysis at the beginning of the search process, especially investigating the use of keywords and their structure and ends with a typology of information search patterns. The paper finishes off with a summary and conclusions.

2 Background

As it is well known, the information search and decision process for tourists is complex (Fodness and Murray 1997). Different researchers have tried to capture this process and its influencing factors. Fodness and Murray (Fodness and Murray 1997, 1998, 1999) developed a general model which is the backbone for many further studies (Vogt and Fesenmaier 1998, Fesenmaier and Jeng 2000, Gursoy and McCleary 2004) investigating the whole process.

The possibilities of the Internet, its expanding and fast developing nature and its growing technical possibilities made it an important information source for travellers and an important field for further research in the understanding of the tourist's information and decision search process. Alike in general perspective, research on the information and decision process on the Internet focuses on the understanding of influencing factors aiming to improve the decision-making ability of (travel) recommendation systems (e.g. Jeng and Fesenmaier 2002,).

An interesting study within the DIETORECS project analysed search strategies of users by observing them during their travel information search using an online travel agency (Grabler and Zins 2002). As a result six different decision styles were

discovered. These decision styles orientate their search either on the price, destination, accommodation, activities, are highly pre-defined or recommendation oriented. But although this study shows the varying kind of information travellers are searching for in the beginning, it does not look into the level of detail of the information requested.

Investigation of user behaviour of web search engines in general is attractive to researchers, although obtaining the data is a difficult task. Several studies have been conducted to examine user interaction with information retrieval systems and web search engines in particular (e.g. Ozmutlu and Cavdur 2004, Ozmutlu et al 2003b, Spink 2002, Jansen et al 2000, Berndt and Spiliopoulou 2000, White and Iivonen 2001).

Jansen et al (2000) found that users are submitting only a few queries per search, most of them only one and these queries are very short. This simplicity of the users search shows also with additional features and possibilities to improve the search. Relevance feedback (e.g. more like this) is rarely used, and Boolean operators are not frequently applied as well. In addition if they are used, very often they are unnecessary or users make mistakes. "The distribution of the frequency of use of terms in queries was highly skewed. A few terms are used repeatedly and a lot of terms only once." (Jansen et al p. 220) Examining the daily life of web searchers reveals further that search behaviour is changing during the day. Searches in the morning are longer, users are submitting more queries and there are generally more users. But characteristics in query formulation concerning term per query and query reformulation stay the same (Ozmutlu et al 2003b).

Besides this simplicity a trend to multitasking searches was discovered (Ozmutlu et al 2003a) where users submitted several queries to subsequent topics. It's suggested that these topics are related to each other (He et al 2002). Automatic topic identification helps to discover the switching to another topic, but methods developed (He et al 2002, Ozmutlu and Cavdur 2004) still need further improvements.

Similar to the development in understanding the tourist's information and decision process, research in understanding web user behaviour has focused on external behaviour influence. A major factor for selecting a search strategy is the original user goal and purpose of the search which then influences the search behaviour (eg. Xie 2002, Sawasdichai and Poggenpohl 2002, Spink 2002, Rose and Levinson 2004). Xie (2002) presented in a study the relationship between interactive intentions (as

identifying, learning, finding, locating, record keeping, accessing, evaluating and obtaining) and the search strategies chosen to reach this goal. The intentions were multi-facet, divided into four types: specific common, area/location and general knowledge. The relationship is complex, for each aim a different set of search strategies was chosen. Sawasdichai and Poggenpohl (2002) used their set of search strategies (exploratory, existence, topical, known item, comprehensive) to discover a similar relationship. They identified different information seeking patterns and detected three frequent ones, where users are struggling.

The learning process during the information search process leaves a lot of potential for search engines. Not only do users experience some level of change in their definition of the problem (Spink 2002), the more users are enjoying the search the more useful they think search engines are for them (Liaw and Huang 2002). A positive attitude to search engines and a satisfaction does not need to implicate a good search result in terms of the search engine. Measures used to evaluate search engines do not correlate with user-based measures (Spink 2002) which shows a need in improving search engines based on user needs. A step for understanding these needs is the understanding of their information search patterns.

3 Methodologies

The research aim of this is to provide a better understanding of the users search process at the very beginning of their search to find potential for further improvement as well as gathering ideas for the development of new and different ways to help users in their search process. For this a log file analysis was conducted with focusing on users behaviour on the starting point and especially analysing the keywords used at this early stage. Additionally the search strategies were further investigated to find patterns for the whole search process and describe different types of search behaviour.

3.1 Data set preparation

The original dataset is based on an internal log file, which collected information of each task executed on Visiteuropeancities.info in September 2003. The data gathered encloses the following information which was used for a further analysis: time of task, IP address, language, city code if the search was conducted referred to a particular city, keywords, and the kind of task executed as well as information about the count of links in the result list, and a code for external city web homepages.

It was important to prepare and clean this original data set for the specific aim to analyse and find information search patterns. The first step included filtering the whole data using only searches in English language, although it was still possible that some of the keywords remained in a different language. As this search engine is continuously changing, evaluated and analysed for research purposes, tasks executed by IP addresses, which used the search engine systematically, were deleted as well. This reduced the data set from original 34.710 tasks to 22.844 tasks, which is the basic data used for all the upcoming analysis.

A further preparation of the data set was the transformation from task oriented to search or session oriented data sets. Normally a session is established as “a sequence of page accesses performed by the user to accomplish a task”. Different approaches depend if backward moves are counted or not, but all suggested approaches split the process in different task and not on the whole time a user do spent on the site (Berndt and Spiliopoulou 2000). In this case a session is defined by all the tasks a user executes on a web site, independent from the completion of several tasks. This definition was chosen to represent the whole picture of the user’s information search process.

In more detail, a session was defined by an IP address which performed tasks are restricted on to single day; sessions overlapping over midnight were re-merged. A second parallel data set was prepared which excluded clicks on the homepage as they blow up the data set unnecessarily and are a bias for further investigations.

Descriptive and multivariate statistical methods were used for analysing the data. Series of frequencies and crosstabulations were conducted for the different data sets in the first step to examine first patterns. Cluster and discriminant analysis were performed to find and assess typical information search patterns for visitors using a travel domain-specific search engine.

The keywords used within open text query were manually recoded into groups and subgroups for a better understanding of the structure and kind of keywords users have in mind when they start their search. These groups are based on the common topics within tourism (accommodation, hospitality, attractions, etc.) using different levels similar to the types of intentions by Sawasdichai and Poggenpohl (2002). The whole set was adapted to the actual values of the single groups, as many of them did not have any values at all, or where too small that combining some of the sub-groups seemed to be reasonable. The detailed taxonomy derived is presented in table 1.

Table 1. Taxonomy used for keyword aggregation

<i>Accommodation</i>	<i>Information</i>
<ul style="list-style-type: none"> • Hotels • Other accommodation types • Accommodation named 	<ul style="list-style-type: none"> • Information, Brochures • Guides • Special Information (e.g. weather)
<i>Attractions</i>	<ul style="list-style-type: none"> • Pictures • Languages
<ul style="list-style-type: none"> • Sights general • Sights more special (e.g. museum) • Sights named • City cards • City tours 	<i>Hospitality</i>
<i>Destination (Places)</i>	<i>Activities (Leisure and Sports)</i>
<ul style="list-style-type: none"> • City name • Country name • Other places/surrounding areas • Special places named (address, centre) • Map 	<i>Events</i>
<i>Transport</i>	<ul style="list-style-type: none"> • Events general • Evens named • Culture and music
	<i>Target groups</i>
	<ul style="list-style-type: none"> • Business, Jobs, Congress • Shopping • City breaks • Diff. target groups

For analysing the keywords further descriptive analysis crosstabulations were used and put into context of usage with particular cities or usage within all cities, as well as with the use of more the one keyword. Especially for the keyword analysis it is important to investigate the starting point, as this is the first question the user has to the system.

4 Results

4.1 The importance of the homepage

A closer a look at the task executed on the search engines shows the importance of different tasks. Clicking and re-clicking on the search engines homepage is the most important task (32.4%) within all tasks, but it has to be said that there is a bias as most of the clicks to the homepage are made again at the very beginning. Analysing the different session's shows that going back to the homepage occurs in each session for about 10%, despite in the first session 93.4% and in the second session 11.3% are clicking on the homepage (see table 2). This behaviour suggests to a homepage not only as a starting point, but also as a restarting point during further processes.

Table 2. Comparison of all executed tasks and the first task executed at the beginning of a session ^{*)}

	All tasks (%)		Starting task (%)	
	All (n=22.844)	Without homepage (n=15.446)	All (n=5.693)	Without homepage (n=3.040)
Click on ECT-B2C homepage	32.4	x	93.4	x
<i>Searches a particular city</i>	7.5	11.1	.7	24.6
<i>Searches a particular keyword</i>	2.5	3.7	.1	2.4
<i>Searches particular city and keyword</i>	3.8	5.6	.3	6.3
Clicks on suggested cities	12.4	18.3	1.2	15.8
Clicks on suggested keyword	2.6	3.9	.4	9.8
Clicks on suggested keyword in a particular city	5.9	8.7	.6	1.2
Visits a particular webpage	4.2	6.2	.5	.9
Visits a city's server homepage	10.1	15.0	.7	1.4
Requests cities from A-Z	9.1	13.4	1.1	27.5
Requests nearby cities	1.1	1.7	.1	.2

^{*)} Other tasks executed to add up to 100% have been requesting street map list, national or European map, impressum or help.

4.2 The starting point and the use of keywords

The start point of a search says a lot about the users. Interestingly most of the users are searching for a particular city (24.5%) and 27.6% request the list of all cities available. Introduced as an inspirational factor a sample of three different cities is shown. 15.8% of users are following this path, which shows a recommendation oriented user (Grabler and Zins 2002). Only a small proportion 2.4% of users search for a keyword throughout all the cities, but 6.3% are searching for a keyword within a particular city. Interestingly even more use the possibility of suggested keywords (9.8%) and 1.2% the combination of a suggested keyword within a particular city. These results show the direct gateway to the official city web homepages at the very beginning.

City (street) maps are an important piece of information that travellers are looking for. 5.1% of users requested the list of city street maps directly at the beginning and "map" is one of the top 5 keywords. The most frequent keyword are hotels and hotel

which enclose together 22.4% of all keywords asked in the beginning. The other keywords are map (12.5%), information (6.5%), guide (4.4%) and events (3.5%). Together they comprise half of all keywords searched at the beginning. 19.5% of all keywords are used only ones. This distribution is similar to the one shown in Jansen et al 2000. The percentages of the keywords change depending if the search is conducted within a particular city or within all cities. In the search for a particular city hotel(s) is less frequently (21%) searched than within all cities (28.4%) but map is more often searched (18.5% compared to 13.2%).

A closer look focused on the keywords shows that the keyword and keyword group most asked for overall and in the beginning is hotel. A quarter (23.4%) of users are looking for hotels in a very general context, only 3.6% are looking for other accommodation types and 0.8% name the accommodation (including hotel) they are searching for. The second most asked for keyword topic are maps (14.9%). Other places asked for are the listed cities themselves (8.3%), and all with less than one percent country names, places and cities in the surrounding of the city and addresses or the centre of cities.

Table 3. Comparison of keyword topic between search within a particular city and open search (p=0.000)

Keyword topic	All cities		Search within a particular city	
	Freq	%	Freq	%
Destination	140	31.9%	246	27.1%
Accommodation	142	32.3%	253	28.0%
Attractions	27	6.2%	95	10.5%
Information	81	18.5%	165	18.3%
Transport	4	.9%	48	5.3%
Hospitality	1	.2%	23	2.5%
Activities	1	.2%	2	.2%
Events	22	5.0%	43	4.7%
Target groups	22	5.0%	29	3.2%
<i>Total</i>	<i>439</i>	<i>100,0%</i>	<i>903</i>	<i>100,0%</i>

Analysing keyword topics shows a different usage of different topics depending on whether the search was conducted for a particular city or for all cities (highly significant, p=0.000). Despite that keywords are searched within a particular city twice as often as for all cities, some of the topics (destination, accommodation, target groups) were more frequently searched throughout all cities, whereby attractions and transport are searched more frequently within a particular city. Furthermore travellers

searching for attractions, transport or events are using more frequently more than one keyword ($p=0.000$).

Independent from their topic the keywords were grouped into specialised and general keywords, which shows again highly significant results ($p=0.000$). Specialised keywords are used for searches within a particular city (13.9%) compared with 3.1% for all cities. In opposite, general keywords are more frequently used for a search within all cities (96.9%). Moreover, they are more frequently conducted with one keyword only (93.0%, compared with 62.2%) whereby specialised keywords do use more often more than one keyword to express their search topic.

4.3 Patterns over time

The importance of the start point is underlined by the fact that the valid number of cases during the search process is declining (compare again with Jansen et al 2002). Independent from the successful completion of their goal 90% of all users have conducted three tasks on the homepage, 50% five task, 20% nine and 15% ten tasks. The changing of keyword topics over time is marginal, percentages differ only slightly and it is suspected that the decline of users is independent from the topic searched for.

A number of cluster analyses and discriminant analyses were carried out to find a reasonable search pattern using the first ten executed tasks. The cluster analysis with nine distinctive groups (search patterns) was selected as the discriminant analysis results gave a high correct classification rate overall (96.5%) and equally high rates within the groups. The nine groups have different group sizes, however it wasn't the goal find equal group sizes but reasonable search patterns. Although the results of the cluster analysis do not imply an order of the tasks, the combination of the different tasks within a search pattern are described in order of importance trying to keep a logical order where possible .

The search patterns deriving (see Table 3) are very interesting, with one large indifferent group (not loading high in any of the variables) which can be understood as the group who uses the web site very fast with selective few, but varying tasks only. The second largest group consists of users searching for only a particular city. A fascinating group is the smallest group where users are searching for a particular city, clicking on the suggested city and requesting national map and nearby cities.

All search patterns have a focus on the search of cities and within particular cities, and are using less keyword searches. Keyword search in this portal is mainly used to

search within a city or/and combined with other search types. General keyword search might be hiding as there are indications for the use of keywords in some of the groups derived, but they are less important compared to the other search tasks within the group.

Table 4. Description of search patterns derived from the cluster analysis

Search pattern type	Size
1 Does not do much and this very indifferent	32,9%
2 Searches a particular city	18,0%
3 Clicks on suggested city, requesting often cities from A-Z and cities server homepage	15,0%
4 Clicks on suggested city, clicks on suggest keywords within a particular cit, requests cities from A-Z and visits the city's server homepage	11,9%
5 Requests national maps, clicks on suggested city and requests also cities from A-Z	6,1%
6 Clicks on suggested city and suggested keyword in particular city	5,9%
7 Requests different maps, clicks on suggested city using mainly cities from A-Z	3,8%
8 Clicks on suggested city and on suggested keyword in particular city, visits the city's server homepage and particular web pages	3,4%
9 Searches a particular city, clicks on the suggested city and requests national map and nearby cities	3,0%

5 Summary and conclusions

The results show a general strong orientation on the city. Users look for a particular city, browse or are getting inspirations for choosing a city. This underlines the main purpose of the portal as a gateway to European cities. Keyword search is adequately used but its major proportion is in the combination of the keyword with a particular city. Accommodation and destinations (places) are the categories users are most searching for, however within a particular city users more frequently also quote attractions and transport. Keyword search within particular cities is also more specialised than a general keyword search. Overall the keyword search is dominated by few keywords (hotel, map, information, guide and events) and few categories (accommodation, destination and information) which lead to a skewed distribution.

As the search engine is the gateway to information it is important to provide links with appropriate information to the user in a fast, easy and appealing way. Fulfilling these requirements should lead to a positive attitude and feedback for the search engine and revisiting users. Understanding the information search patterns and the

search starting point is the basis for innovative developments and improvements to support travellers' information search and decision process. The strong focus towards the search for cities underlines the gateway function and a success in providing so.

The skewed distribution of keywords and the recommendation orientation of the users leave plenty of space for inventive new ideas. It is therefore suggested that further investments should be made in different search strategies, especially in the inspirational path. The popularity of the homepage in the beginning indicates new and different directions not only for marketing the cities but also to market events, special occasions to offer extra inspiration for revisiting users. It shows further how important these few keywords and categories are and it is suggested to think about new initiatives to provide faster links to these keywords within the cities. The city homepages should bear in mind that these categories are important for them, especially hotels and prominent position within their homepage should additionally improve the fast access. Furthermore interesting for the cities themselves is that users are looking for special places and attractions within a city and more comprehensive information about this should fulfil these extra needs.

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6 To assess Web site efficiency of destination organisations

Bauernfeind, U. and Mitsche, N. (2008) 'The Application of the Data Envelopment Analysis for Tourism Website Evaluation', *Journal of Information Technology and Tourism*, 10(3). 245-258.

6.1 Background & Innovation

This paper (Bauernfeind and Mitsche, 2008) assesses the web site efficiency of destination management organisations. Creating a useful and attractive web site for destinations is part of a destination management organisation's (DMOs) remit in promoting destinations online. They have to continuously compete with other destinations in the global marketplace to gain and retain visitors. In parallel, more and more travel information from other providers is available outside the destination's own web site, often appearing further on the top of search engine results. Consumers got used to exploring different sources, but are still simple and impatient in their search behaviour (Gretzel et al., 2004; Pan, 2015). In this competitive online environment it is even more important for DMOs to become visible on top of search engines and to be a valuable and trusted source for tourist decision making. Analysing which features make their web sites more effective in terms of success (number of email enquiries and web site visits) and in terms of the efficient use of their resources will help destinations improve their online provision staying ahead of their competitors. The study provides insights beyond traditional web site evaluation approaches based on usability (Krug, 2013; Nielsen and Loranger, 2006) by extending the perspective and focusing on the point of view of the destination, quantitatively evaluating the practice of different destinations through data envelopment analysis (DEA), and identifying best practice examples and recommendations for the sector (Bauernfeind and Mitsche, 2008).

Traditional *web site evaluation* approaches assess the appearance of web sites with a strong user focus by measuring varied dimensions such as perceived usefulness and ease of use (Davis, 1989) which are interlinked with other varied web site evaluation methods from bestselling authors in the field such as Nielsen (Nielsen, 1994, 1993; Nielsen and Loranger, 2006) and Krug (Krug, 2013). Davis' (1989) TAM model has been and continues to be widely applied, adapted and expanded since its first appearance (Ayeh, 2015; Sahli and Legohérel, 2016; Zins et al., 2004). These evaluations are conducted either by experts, users, or using computer generated data (Ivory and Hearst, 2001). In all these approaches though there is a strong link to 'effectiveness'; how well web sites perform in the context of users' aims and needs (Carnegie Mellon Software Engineering Institute, 2008).

This study analysed features of the web site collected by a web crawler in conjunction with success measures provided by destinations. It focuses on efficiency rather than effectiveness of resources because performance measurement is based on the invested resources into a web site rather than their outcomes. The user perspective is though indirectly measured in the outcome through the users' choice by visiting the web site or sending an enquiry. The main objective of this research was to assess web site efficiency of destination organisations. In particular, it set out to identify success indicators, benchmarking partners for destinations and best practice examples. The paper has been anonymised for confidentiality reasons.

6.2 Methodology

The research is based on aggregated data from a number of different sources. A content mining tool named Lizard, (Lizard, 2015; Scharl, 2012) was used to gain data on web site features in particular regarding interactivity. Data regarding searchability was collected through a search engine monitor called Rankpilot (www.rankpilot.com) combined with search results of the English destination name from four search engines (Google, Yahoo, Alta Vista, Lycos). The data was prepared to fit the setting for data envelopment analysis software, which enables a statistical and, as such, a quantitative approach to benchmarking. Additionally the web sites were

manually assessed based on their linguistic offer and their travel content. The data was prepared and each destination was anonymised and their name replaced by DMU and a number for confidentiality reasons. Each of the measures were tested through a regression model for their suitability (significance) in the overall model. The results confirmed the significance for all measures.

The DEA was conducted using the EMS (Efficiency Measurement System) software, which is a freely available for academic purposes (Scheel, 2015). The final input measures used in the model were languages, forms, searchability (findability), travel preparation criteria and updating, and the final output measures, which were visits and e-mail enquiries. As the spotlight of the research was on the improvement potential, rather than reducing the inputs to be more efficient with the same outputs, the model chosen was output-oriented. The selected efficiency measure was CRS (constant returns to scale) which defines the built up of the envelopment. The assumption was made on same improvement potential for all measurements (radial distance) which enables clear interpretation due to its simplicity (Scheel, 2000).

From a completed data of 77 tourism organisations, 37 met the conditions (no missing data) to be used for the DEA. The main limitation of the approach is concerned with the delay in terms of the reporting period and the evaluation period. Web sites are updated on a continuous basis and, as such, by the time recommendations are made their appearance will have changed in some parts. Further limitations in the DEA approach are the assumption of same improvement levels, which could require appropriate adjusting and adding a new benchmarking partner, which will change the results. Besides the limitations, the approach enables destination management organisations to compare their web site efficiency within the sector and further improve decision making. This research does not include uncontrollable factors of a destinations, which are playing an important role in tourism (Wöber and Fesenmaier, 2004).

6.3 Findings and Contribution

The research presented assessed the efficiency of official tourism organisation web sites. The use of DEA enabled the possibility to combine a number of output and input measures at the same time. It demonstrated that DEA is a useful tool for positioning and comparing the efficiency of different tourism web sites. The findings categorise the web sites in 12 efficient and 35 inefficient web sites. Each of the inefficient web sites had an efficiency score which indicated the extent of inefficiency, e.g. a score of 159% meant it is was 59% inefficient, meaning with the current inputs its outputs should be 59% higher. Additionally information on benchmarking partner is given, not only highlighting each of the benchmarking partners, but also indicating a weighting for the importance of each of them. The software also calculates a virtual benchmark for any chosen tourism web site, providing information of an optimal input-output combination. Comparing itself with this virtual benchmark, and the inputs and outputs of their benchmarking partners, tourism organisations are able to clearly see their shortcomings and improvement potentials. Efficient tourism organisations can see how often they have been selected as benchmarking partners. By identifying and further evaluating benchmarking partners and other best practice examples they are able to improve further on their current offer.

As such this research highlights, that using a quantitative benchmarking approach such as the DEA enables organisations to identify specific improvement potentials and success criteria, but also learn from identified benchmarking partners with best practices.

The innovation of this research is the application of a benchmarking approach for web site evaluation. Applying DEA for tourism web sites does not only provide a positioning tool for destination management organisations, but also enables the identification of success criteria and improves the sectors web interface. In general, research on tourism web sites investigates their effectiveness rather than an efficiency perspective as utilised in this approach, which gives a distinctive new perspective to destination management organisations.

This paper contributed to an understanding of assessing web site efficiency of destination organisations by

- Identifying DEA as a useful method to reflect on efficiency and inefficiency using multiple input and output measures
- Highlighting the opportunities in identifying benchmarking partners and improvement potentials for destination management organisations
- Identifying a benchmarking approach to improve the web site appearance of the destination web site sector

6.4 Summary & Response to Objective

The main research objective was to assess web site efficiency in destination web sites. The research outcomes underline the importance of benchmarking for destination management organisation as a medium of knowledge exchange, and the ability to focus on specific functions of their organisation such as their web sites (Alzua-Sorzabal et al., 2015; Bauernfeind and Mitsche, 2008). The research meets the objective by providing a clear method to address questions of web site efficiency through the application of DEA and highlights the importance of organisations to work together to improve as individuals and as a sector to gain competitive advantage outside the destination management sector in their online presence.

6.5 Paper

THE APPLICATION OF THE DATA ENVELOPMENT ANALYSIS FOR TOURISM WEBSITE EVALUATION

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Tourists are increasingly using the Internet for travel preparation and booking. At the same time tourism organizations are facing increased competition regarding their website offers. Therefore, the aim for tourism organizations and businesses should be to provide more efficient websites in order to gain competitive advantage. This study provides an example of how Data Envelopment Analysis (DEA) can be used to assess the website's efficiency of tourism organizations. Input criteria include the linguistic offer, interactivity, and tourism content, and output is defined by number of inquiries and number of website visits. It is argued that efficient organizations should be considered useful benchmarking partners for inefficient organizations in that best practices should be used to identify the potential for improvement.

Key words: Data envelopment analysis (DEA); Benchmarking; Tourism websites;
Website evaluation

Introduction

The Internet offers a tremendous number of websites and the tourism industry has been particularly active with online destination marketing (Feng, Morrison, & Ismail, 2003). According to Marcussen (2008), Internet sales within the travel market rose by 24% during the year 2006 to 2007, and they are expected to amount to 22.5% of total travel sales in 2008. Consumers and potential tourists not only have a greater affinity with the Internet for planning and purchasing purposes, they have also gained more experience. Furthermore, they have a wider choice: more and more tourism

websites are available. Therefore, tourism website providers are increasingly under pressure to maintain an edge with the design, service, and perceived efficiency of their online offer.

A number of studies (Hvannberg, Lai-Chong Law, & Lárusdóttir, 2007; Zins et al., 2004) have been conducted to evaluate website effectiveness from the user's point of view. Traditional website assessment approaches such as user or expert evaluations are valuable and indispensable tools. However, they do not consider the organizational effort (e.g., investments in the website) which is important because it reflects the significance the website has for the organization and/or the organizational

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and financial capabilities of the tourism offices. This can issue can be overcome by taking into account the organizational inputs (e.g., website design efforts), thereby providing the basis for comparative evaluation of website efficiency.

The article aims to enhance the perspective of website evaluation methods by using Data Envelopment Analysis (DEA) as a basis for evaluating the websites of tourist offices. This quantitative evaluation approach goes beyond traditional attempts by focusing directly on the point of view of the tourism organization. In particular, the article focuses on the use of DEA as a tool for website evaluation. Furthermore, the article provides a framework for the integration of best practices as a methodology for evaluating tourism offices websites. The article is presented in five sections. First, benchmarking, in general, and the DEA method, in particular, are outlined, followed by an overview of previous applications of the DEA in different sectors. Also, an overview of different website evaluation methods and assessment factors used is given. The study methodology is outlined next and how the input and output factors for the DEA were chosen. Furthermore, the data collection is illustrated. The application of the DEA for the given sample of tourism offices' websites is described and results are presented. Then, the general framework for website evaluation is outlined. The article concludes with shortcomings of the study and future research directions.

Benchmarking and Data Envelopment Analysis (DEA)

Benchmarking is defined as the identification of, and the learning from, best practices (Johnson & Mistic, 1999). Best practices are the highest standards for products, services, or processes (Elmuti, 1998; Elmuti, Kathawala, & Lloyd, 1997). The major aims of benchmarking approaches are performance evaluation, continuous improvement, learning, and growth objectives (Elmuti et al., 1997). Benchmarking is definitely a valuable approach to achieve and keep competitive advantage (Elmuti, 1998).

The DEA is a mathematical model based on linear programming, allowing the evaluation of

relative efficiencies and inefficiencies of decision-making units (DMUs) as well as the identification of benchmarking partners. A DMU is defined as the entity that organizes and decides about the employed inputs and outputs. Their performance is subject to the evaluation (Cooper, Seiford, & Kaoru, 2000). A DMU may be an organization or operating unit such as a bank, a hospital, or a supermarket. In the tourism sector, DMUs can range from hotels to destinations or, as in this example, the tourism offices. A group of DMUs is benchmarked against each other if there are comparable inputs and outputs and if there is a certain degree of freedom of managerial decision making (Cooper et al., 2000). A further important condition is that the DMUs' goals and objectives have to be the same (Anderson, Sweeney, & Williams, 1997). When speaking of the measure of efficiency, the maximum of a ratio between weighted inputs and weighted outputs is analyzed (Charnes, Cooper, & Rhodes, 1978). Efficiency can be described as "the degree to which a system performs with minimum consumption of resources" (Institute of Electrical and Electronics Engineers [IEEE], 1990). Multiple inputs (e.g., costs) are opposed to multiple outputs (e.g., benefits). When looking at the differences between efficiency and effectiveness, it seems that effectiveness is more connected to the users. Effectiveness is "the degree to which a system's features and capabilities meet the user's needs" (Carnegie Mellon Software Engineering Institute, 2008). This study focuses rather on the efficiency of the websites because the performance measurement is based on the resources the organizations invest into their websites compared to the outcome. However, it is related to the users' point of view as well, which is expressed by the outcome (e.g., number of website visits or number of inquiries).

The DEA model can be either input or output oriented. Output orientation means that a DMU is evaluated as efficient if it is not possible to increase any output (without raising any inputs and without decreasing any other output). In the case of input orientation, a DMU is qualified as efficient if it is not possible to decrease any inputs and the outputs stay the same or any other input is increased. This is also called Pareto efficiency (Charnes, Cooper, & Rhodes, 1981).

DEA overcomes the limitation that only a restricted number of inputs and outputs can be analyzed, as is found in other efficiency-evaluating approaches, and allows for the processing of multiple inputs and multiple outputs simultaneously (Cooper et al., 2000). This requirement is absolutely necessary because most organizations deal with at least multiple inputs (Anderson et al., 1997). Other methods, such as regression analysis, allow inputs and outputs to be analyzed but without the possibility of showing any benchmarking partners and offering feedback about improvement potentials (Donthu, Hershberger, & Osmonbekov, 2004). Furthermore, a regression model could integrate organizational factors but only one dependent variable could be incorporated at a time. Reflecting on these issues, the combined advantages of the tourism organizational points of view, having multiple inputs and outputs, and identifying benchmarking partners makes DEA so attractive for this study. Further advantages of the DEA method are the identification of possible inefficiencies of either the input or output side for each entity (Cooper et al., 2000). Moreover, there is no a priori information required; thus, it is not necessary to define which inputs and outputs are the most important (Wöber & Fesenmaier, 2004) and the DEA is independent of the units of measurement (Herrero & Salmeron, 2005).

Despite its significant strengths, DEA has some limitations as the method depends strongly on the variables chosen. Thus, the efficiency measurements might not be valid any more if other variables have been included in the analysis. As a result, inefficient websites may apparently turn into efficient ones when other inputs and outputs are used and vice versa. Furthermore, this also means that as soon as a new DMU is introduced into the analysis, the outcome might change. Putting these weaknesses in another perspective, this means also that there is a continuous learning process involved, which enhances the method to be used more often.

Gattoufi, Oral, and Reisman (2004) analyzed DEA articles and noticed an increase of 150% of publications between the year 1995 and 2001. This research conducted an extensive analysis of all used of DEA within the context of IT and tourism and found that DEA is quite popular in both disci-

plines but has not been used for tourism website evaluation; one exception is a study on the hotel sector in Greece and their Internet marketing strategies (Sigala, 2003). In the field of e-commerce, benchmarking methods are often used (Jutla, Bodorik, & Wang, 1999), and Johnson and Mistic (1999) applied a benchmarking approach to evaluate websites and subsequently improve them. In addition, the efficiency of companies in the field of the Internet was evaluated by Serrano-Cinca, Fuertes-Callen, and Mar-Molinero (2005).

The travel and tourism industry has recognized that benchmarking is a valuable tool to learn from best practices and to exchange knowledge (Oertel, Feil, & Thio, 2002). Several studies can be found applying DEA in the field of tourism, such as measuring the performance of European museums (Remich, 2002) or the productivity of restaurants (Reynolds, 2004). Wöber and Fesenmaier (2004) applied DEA to assess tourism advertising programs in the US. In addition, DEA has been used to evaluate the hotel industry (Sigala, 2002; Sigala, Airey, Hones, & Lockwood, 2004) in terms of information and communication technology (ICT) use efficiency; Hu and Cai (2004) assessed hotel labor productivity; Hwang and Chang (2003) applied the DEA to assess hotel managerial efficiency in Taiwan; and a benchmarking analysis for Austrian hotels was conducted by Wöber (2002).

Website Evaluation

Developing and maintaining a website requires a large amount of resources. The emergence of websites produced by new players or incumbent rivals makes competition harder. Evaluation is a prerequisite of being able to improve a website (Spiliopoulou, 2000), and the recognition of this need has led to the development of a number of different website evaluation approaches. Numerous website evaluation studies exist relying either on qualitative methods by collecting and analyzing user or expert opinions (Zins et al., 2004) or on applying quantitative measures such as automatic generated website metrics (Scharl, 2000) or standardized questionnaires (Lewis, 1995). Qualitative methods include, for example, a protocol analysis or the think-aloud technique in which the test persons express their opinions about the website

while browsing (Benbunan-Fich, 2001; Lindgaard, 1994). Cognitive walkthrough is a further example of a qualitative method that is performed by an expert simulating a user's problem solving and producing a list of problems perceived or shortcomings of the website (Ivory & Hearst, 2001). Quantitative analysis includes software tools automatically generating data and metrics about a website [e.g., interactivity (forms, links) or design such as pictures and font size] (Scharl, 2000). Further examples are Ivory and Hearst (2001), Olsina, Lafuente, and Rossi (2000), and Olsina and Rossi (2001), who built frameworks for quantitative website assessment. These evaluation methods have the advantage that they are more reliable, comparable, and immune to subjective human assessments (Bauer & Scharl, 2000; Olsina & Rossi, 2001). This study applies automated as well as manual data collection methods, which are outlined in Table 2.

Two factors that are probably most often applied when assessing websites are ease of use and usefulness originally proposed by Davis (1989) in his Technology Acceptance Model (TAM). The TAM was enhanced by, for example, playfulness (Morosan & Jeong, 2006), enjoyment (Childers, Carr, Peck, & Carson, 2001), or trust (Pavlou, 2001). Parasuraman, Zeithaml, and Malhotra (2005) suggested an electronic service quality (E-S-QUAL) scale consisting of four dimensions: efficiency, fulfillment, system availability, and privacy. When reviewing studies focusing on tourism website evaluation it turned out that the content (usefulness) and functionalities seem to be particularly important. The provision of multilingual content in the field of tourism is obvious (Nysveen & Lexhagen, 2002). According to Nielsen (1996), tourism information systems have to be designed and constructed to enable a foreign traveler, not understanding the national language, to use the system in a convenient way. What are the possibilities for a user coming to a site where only the national language is provided and the user does not understand the language? The website will be abandoned immediately or the user might look at some pictures and then give up. Thus, the destination has lost a potential tourist. Of course, the goal for every tourist office should be to avoid such a situation.

Furthermore, the provision of specific tourism information for a travel website is self-evident. The features of a website should provide information about facilities and services available to visitors (Cano & Prentice, 1998). Hypertext is particularly predestined to provide tourist information because it is easy to structure the content according to subcategories like accommodation, attractions, history, restaurants, shopping possibilities, museums, and sightseeing (Nielsen, 1996). In this study, we refer to the travel preparation criteria, which include factors essential for planning a stay at a foreign place: culture, attractions and sights, general infrastructure, accommodation, F&B supply, activities, and entertainment (Dettmer, 2000). They form the main information needs of potential tourists. A framework consisting of these travel preparation criteria makes sense because this type of tourism-related content was identified by former studies being desired by potential tourists (Tierney, 2000). Furthermore, they were used in previous evaluation studies to assess the tourism-related content (Cano & Prentice, 1998; Feng, Morrison, & Ismail, 2004). These content criteria should be provided on an updated level because there is no use in finding information about outdated accommodation vacancies or events that already took place.

A problem often occurring for tourism websites is the "Who is official" dilemma described by Morrison, Mills, Chuvessiriporn, and Ismail (2002). In many cases it is very hard to distinguish between the official tourism office site and another one, because there are tourism website providers using the term "official website of the city/country," although they are not representing the official tourism office. Therefore, the searchability or findability of tourism websites is particularly important. If websites are not found, the obvious consequence is that they simply cannot be visited. The searchability criterion includes the evaluation according to the incidence of representation of the respective websites by well-known search engines. What takes a user, when searching for a destination without knowing the exact URL address, to any given site? The majority of potential tourists try to find their desired website with the help of search engines (Hudson & Lang, 2001). Therefore, increasing the awareness of a website should

be an objective already widely recognized. For this reason sites could be distributed to relevant search engines and web directories (Smith, 2001). Registering with search engines is just like choosing an easily memorable URL name, an important means through which to promote a site (Jung & Butler, 2000; World Tourism Organization, 2001; Zhenhua, 2000). The Institute of Electrical and Electronics Engineers (IEEE) developed a Web Publishing Guide and devoted one chapter to searchability. Topics like “Make your documents easy to find” and “Carefully select an appropriate title” are found in it.

Interactivity enables one-to-one communication and marketing and includes possibilities for users to interact with the provider of a website by means of online questionnaires (forms) or e-mail links. In the context of tourism, interactive website features have a particularly high significance because it enables important actions such as making reservations or ordering brochures. Chung and Zhao (2004) found out that perceived interactivity has a positive influence on attitude and memory towards the website. Interactive features are considered to be major milestones and Web-based forms add value to a tourism website (Doolin, Burgess, & Cooper, 2002). Forms are a highly relevant means of communication with the tourism office. All kinds of user-input forms (e.g., feedback, e-mail forms, and brochure ordering forms) are summarized under the term “online questionnaires,” but it also includes when a term is entered in the field of a search engine. Thus, the importance of the provision of online questionnaires and the contribution of forms to make a website interactive is obvious.

On the outcome side some studies use the construct of satisfaction (McGill, Hobbs, & Klobas, 2003; Rodgers, Negash, & Suk, 2005) or electronic service quality (Parasuraman et al., 2005). This study relies on two parsimonious output criteria when measuring efficiency: number of visits and number of e-mail inquiries. These indicators were used in previous DEA studies focusing on websites (Serrano-Cinca et al., 2005; Sigala, 2003). Figure 1 summarizes the input and output measures used in the final model. The input factors were: the linguistic offer, travel content or travel (preparation) criteria, the number of forms as an

indicator of the interactivity of the website, the searchability of the respective website (how good is the representation of the website on search engines), and, finally, how often the website is updated. The output measures used were the number of visits and e-mail inquiries.

Methodology

Prior to conducting a DEA, input and output factors have to be chosen carefully (Wöber, 2000). Sigala et al. (2004) used a stepwise process to select relevant input variables. For this study, the relevant input variables were derived from literature review and regression analysis. More specifically, the results of the regression analysis presented in Table 1 identifies the factors (number of languages and the number of distinct forms) influencing the number of visits and number of e-mail inquiries. Using the number of visits as the dependent variable, the number of distinct forms has a positive significant impact whereas for the number of e-mails it exerts a negative significant influence. This outcome is not contradictory because the user does not need to write an e-mail in the case where a form is provided. The number of languages was positively significant for both dependent variables. Therefore, these two variables, number of languages and number of forms, were selected as input for the DEA. Furthermore, the searchability/findability criterion was added because of the importance assigned when reviewing the literature (Hudson & Lang, 2001; Jansen & Spink, 2006). The same is true for the travel content and updating of the content (Lu, Deng, & Wang, 2007; Mills & Morrison, 2003).

Different approaches were used for data collected in 2002. First, an e-mail-based survey was conducted among tourism organizations to gain data about the outputs and the frequency of updating of the website’s content. The success indicators—hits, visits, number of online inquiries, and the frequency of updating—were retrieved by a survey conducted among European Cities Tourism (ECT) members. Furthermore, the members of ETC, the European Travel Commission, which is a network of the European national tourist boards, were invited to participate in the study. Finally, tourism offices that were neither member of the

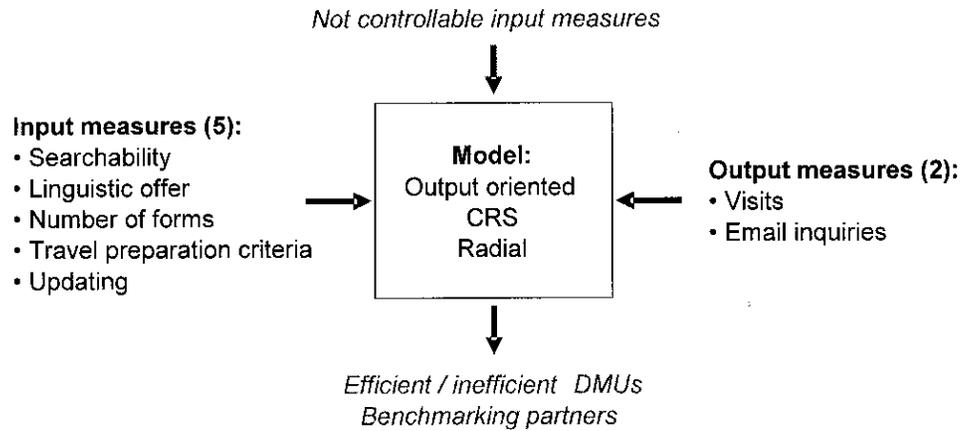


Figure 1. DEA website evaluation inputs and outputs.

ECT nor of the ETC were asked to fill in the questionnaire as well. The questionnaire was sent to 233 tourism offices and 77 returned the completed questionnaire; thus, the response rate was 33%. The DEA was applied on 37 tourism organizations; for the others too many missing variables were found (on the output side).

A content mining tool (named webLyzard; Scharl, 2000) was applied to gain data about interactivity. A search engine monitor (called Rankpilot, <http://www.rankpilot.com/>) was used to check the searchability of the websites. Four search engines, Google, Yahoo, Altavista, and Lycos, were also used to assess searchability. Specifically, analyses were conducted to identify if they were the most popular within Europe and if they represented different search engine techniques. Google counts on quotation indexes to rank websites, Al-

tavista applies a purely automatic approach by extracting keywords out of documents, and Yahoo relies additionally on human intervention and is the largest human-compiled guide to the Web. Each URL address was searched using the destination name in English. Finally, the websites were assessed manually regarding their linguistic offer (combined with the content mining tool) and their travel content. Table 2 summarizes the data collection method used for each variable, the metrics used, and the definition of each factor.

The software used to conduct DEA is called Efficiency Measurement System (EMS) and is freely available for academic purposes at the website of Holger Scheel (www.wiso.uni-dortmund.de/lsg/or/scheel/ems). The following options were chosen to set the final model (Fig. 1). An output-oriented model was selected that focuses on the

Table 1
Results of Regression Analyses

	Beta-Coefficient	t-Values	Significance
Number of visits ($R^2 = 16.4\%$, $F = 5.31$)			
Number of languages	0.28	2.21	0.03
Number of distinct forms	0.25	1.96	0.06
Number of total e-mails ($R^2 = 51.4\%$, $F = 9.50$)			
Number of external links per document	0.67	4.22	0.00
Number of languages	0.44	3.91	0.00
Number of distinct forms	-0.39	-3.27	0.00
Number of e-mail links per document	-0.43	-3.29	0.00
Number of tables per document	0.31	2.42	0.02

Table 2
Definition and Data Collection of Input and Output Factors

Factors	Definition	Method Used for Data Collection	Metric/Category Used for Operationalization
Inputs			
Languages	How many languages are provided on the website?	Automated tool combined with manual investigation	Number of languages (1 to 15)
Forms	User-input forms, online questionnaires	Automated tool	Number of distinct forms (absolute number)
Searchability (findability)	How are the websites found by search engines?	Automated tool	0 to 5 points: 0 = not found at all, 1 = found but not within the first 50 results, 2 = found within results 21 to 50, 3 = found within results 11 to 20, 4 = found within results 6 to 10, 5 = found within results 1 to 5 on the respective search engine
Travel preparation criteria	Tourism information, content	Manual investigation of the websites	None to all criteria covered (0 to 6 points)
Updating	Keeping the content of the website on a current level	Survey among tourism organizations	Fewer than half a year to every day (0 to 6 points)
Outputs			
Visits	Number of visits the tourism organization achieved within 1 month	Survey among tourism organizations	Absolute average number of visits within 1 month
E-mails	Number of e-mail inquiries received by the tourism organization	Survey among tourism organizations	Absolute average number of e-mails received within 1 month

improvement potential, keeping all other options the same; this contrasts with an input orientation, which would focus on reducing inputs to improve efficiency. CRS (constant returns to scale) was selected as the efficiency measure. This defines the way the envelopment is built up. Radial distance, which assumes the same improvement potential for all measurements, was chosen due to its simplicity and clear interpretation (Scheel, 2000).

Results

Descriptive Results

First, a short descriptive overview of the input criteria assessed will be given. On the input side no missing values occurred. Therefore, the sample size for the descriptive results outlined below is 77 tourist office websites. An analysis of the interactivity indicator forms revealed that 22% of the sites did not include even a single form, thus neglecting the important possibility for a potential traveler to get in contact with the tourist office by this type of interactive feature. Nearly one half (48%) of the sites investigated provided an absolute number of forms below 100, 18% being found

between 100 and 500 forms and 9% of the tourist offices equipped their site with more than 500 forms. But when evaluating the variable form the number of distinct forms was taken into account as well because it shows the different inquiry possibilities a user has. On average 8.5 distinct forms were provided by the websites.

Findings for the linguistic offer suggest that there are huge differences regarding the provision of multilingual content. There were still a high percentage of tourist offices (23%) providing just one language on their site; 83% provided English and nearly 60% of the sites offered German content (but this is partly due to the high representation of German websites in the sample). As for French, Spanish, or Italian languages, these languages were not very well represented on the respective websites (32% for French and 22% for both Italian and Spanish). The necessity of providing English is self-evident, but the more languages the better. However, it should be a goal that the links in the different languages are working, as there is no value in offering language links that are not functional. Some destinations seem to have detailed knowledge about their target markets be-

cause they offered languages, like Japanese, that are seldom seen on European tourism websites despite the importance of the Japanese market for European city tourism. Furthermore, a website tailored specifically to certain markets is of particular importance when thinking of the distance between Europe and Japan and thus could represent a significant advantage.

An examination of the six travel preparation criteria for the given sites revealed that at more than one half of the sites (54.5%) all or almost all of the criteria can be found; 30% of the sites contained information about three or four criteria of travel preparation. The distinct assessment of National and City Tourist Offices suggests that NTOs offered better provision of travel content than CTOs. Some sites' structures followed or were similar to this classification scheme of the travel preparation criteria. The travel-related content was available at first sight or was easily searchable. Regarding the availability of the six travel preparation criteria at first sight, at 53% of the sites all the criteria were found immediately whereas at 47% of the sites further investigation was necessary to find them.

The analysis of searchability revealed results being highly different from site to site. Some websites were very well represented by search engines, being within the top 10 of all of the four search engines, whereas others were not found in the first 50 results, while some sites were not found at all; 45.8% of all websites were included in the first 50 results but the percentage decreased to 40% when looking at the first 20 results. The searchability results are not overwhelming because in more than one half (54.2%) the site was not found within the first 50 results; the question is, how many more than 10 or 20 results does a user examine? Another problem arising when the website is not found within the first results is that the user might look at a website that is not the official tourism office website. The "Who is official" dilemma as described above occurs.

The analysis of the final input criteria, updating of the content, produced the following results. Updating seems to be considered as an important matter. More than one half (55%) of the tourism offices update their content every day. One quarter provide the user with updated information once a

week. Seven percent of the sites are updated more frequently than monthly and another 7% conduct updating monthly; 5.4% of the tourism offices indicated that they have an updating every half a year or less frequently.

As far as the output criteria are concerned, the number of visits was below 10,000 visits a month for 16% of the tourism offices; 40% of the websites had an average number of visits per month between 10,001 and 40,000, and 44% of the tourism offices indicated that their number of visits is more than 40,000 each month. The number of inquiries exceeds 4,000 average inquiries per month for 6% of the tourism offices; 21% indicated to have between 1,001 and 4,000 inquiries per month. The remaining 72% have a number of inquiries of 1,000 or below.

DEA Results

Table 3 presents the findings of the DEA using the input-output combination explained previously. The first column indicates the number of the DMU. The table is sorted by column two, the output-oriented efficiency score of the DEA calculation. Being below 100 means that the websites are efficient in terms of the chosen variables. Scores above 100% indicate inefficient websites. DMU28 has a score of 159%, meaning it is 59% inefficient. The outputs could be increased by 59% while having the same level of inputs. Column three shows the related benchmarking partners for the inefficient DMUs. Furthermore, it includes the intensity/weighting for the respective partner in brackets (Scheel, 2000). When looking at DMU33 only one benchmarking partner was identified, whereas for DMU22 three benchmarking partners were suggested: DMU3, DMU20, and DMU32. Looking closer at the weights it turns out that DMU32 is the most relevant benchmarking partner, having a weight of 0.79. For the efficient DMUs the number of times they have been identified as a benchmarking partner are shown (e.g., DMU3 was identified as being very efficient and is therefore named as benchmarking partner 20 times). The input-oriented scores (column four) and benchmarks (column five) show a similar picture, although their interpretation varies slightly to the different focus. A score higher than 100% in-

Table 3
DEA Results (CRS Radial Output and Input-Oriented Model)

DMU	Output Orientation				Input Orientation							
	Score	Benchmarks			Score	Benchmarks						
Inefficient DMUs												
21	8987%	3 (0.13)	11 (0.18)	19 (0.10)	1%	3 (0.00)	11 (0.00)	19 (0.00)				
14	2076%	3 (0.00)	9 (0.08)	17 (0.48)	19 (0.44)	5%	3 (0.00)	9 (0.00)	17 (0.02)	19 (0.02)		
8	1221%	3 (0.29)	20 (0.02)	31 (0.52)	32 (0.17)	8%	3 (0.02)	20 (0.00)	31 (0.04)	32 (0.01)		
23	927%	3 (0.04)	11 (0.06)	20 (0.07)	31 (0.32)	32 (0.11)	11%	3 (0.00)	11 (0.01)	20 (0.01)	31 (0.04)	32 (0.01)
27	845%	3 (0.06)	17 (0.21)	19 (0.44)			12%	3 (0.01)	17 (0.03)	19 (0.05)		
5	804%	3 (0.08)	11 (0.07)				12%	3 (0.01)	11 (0.01)			
25	752%	3 (0.04)	9 (0.50)	18 (0.24)	19 (0.11)	20 (0.01)	13%	3 (0.01)	9 (0.07)	18 (0.03)	19 (0.01)	20 (0.00)
36	648%	11 (0.50)	32 (0.25)				15%	11 (0.08)	32 (0.04)			
34	581%	2 (0.13)	3 (0.08)				17%	2 (0.02)	3 (0.02)			
13	570%	3 (0.05)	19 (0.20)	20 (0.24)	31 (0.50)		18%	3 (0.01)	19 (0.04)	20 (0.04)	31 (0.09)	
35	522%	9 (0.79)	17 (0.09)				19%	9 (0.15)	17 (0.02)			
26	510%	11 (0.12)	20 (0.19)	31 (0.23)	32 (0.46)		20%	11 (0.02)	20 (0.04)	31 (0.05)	32 (0.09)	
29	505%	3 (0.28)	18 (0.11)	20 (0.01)			20%	3 (0.06)	18 (0.02)	20 (0.00)		
30	463%	3 (0.26)	11 (0.22)	19 (0.31)			22%	3 (0.06)	11 (0.05)	19 (0.07)		
33	391%	9 (1.00)					26%	9 (0.26)				
15	330%	3 (0.07)	18 (0.56)	20 (0.04)			30%	3 (0.02)	18 (0.17)	20 (0.01)		
1	326%	3 (0.09)	9 (0.12)	18 (0.38)	19 (0.02)	20 (0.34)	31%	3 (0.03)	9 (0.04)	18 (0.12)	19 (0.01)	20 (0.10)
22	299%	3 (0.19)	20 (0.02)	32 (0.79)			33%	3 (0.06)	20 (0.01)	32 (0.26)		
16	257%	3 (0.06)	11 (0.06)	19 (0.63)			39%	3 (0.02)	11 (0.02)	19 (0.25)		
12	215%	3 (0.03)	9 (0.38)	19 (0.16)	20 (0.07)		47%	3 (0.01)	9 (0.18)	19 (0.07)	20 (0.03)	
7	211%	3 (0.03)	17 (0.11)	19 (0.22)			47%	3 (0.01)	17 (0.05)	19 (0.10)		
37	173%	3 (0.00)	9 (0.42)	18 (0.07)	19 (0.39)		58%	3 (0.00)	9 (0.24)	18 (0.04)	19 (0.23)	
6	167%	11 (0.59)	19 (0.04)	32 (0.16)			60%	11 (0.35)	19 (0.02)	32 (0.10)		
28	159%	3 (0.00)	11 (0.04)	19 (0.48)	31 (0.14)	32 (0.33)	63%	3 (0.00)	11 (0.03)	19 (0.30)	31 (0.09)	32 (0.21)
10	156%	3 (0.09)	19 (0.82)	20 (0.01)	32 (0.07)		64%	3 (0.06)	19 (0.53)	20 (0.01)	32 (0.05)	
Efficient DMUs												
32	90%	8					111%	8				
19	77%	14					130%	14				
31	76%	5					131%	5				
20	72%	11					138%	11				
4	70%	0					142%	0				
2	61%	1					163%	1				
18	59%	5					170%	5				
11	57%	9					177%	9				
17	51%	4					198%	4				
9	22%	7					465%	7				
3	4%	20					2686%	20				
24	0%	0					big	0				

dicates in this case the efficient DMUs, and lower than 100% the inefficient ones. Reflecting on the example above of DMU28, a score of 63% stands for 37% inefficiency, suggesting that inputs could be decreased by 37% while still keeping the same level of outputs.

Table 4 gives a benchmarking example for one of the inefficient websites (DMU35). DMU35 could orientate itself on a so-called virtual benchmark, which would be the optimal output given a similar input combination of DMU35. In Table 4 all inputs and outputs are shown in the first col-

umn. The second column indicates the respective figures for DMU35 [e.g., on its website three language versions are offered and almost all of the travel preparation criteria (5 out of 6) were found]. The searchability of the website is not good (3 out of 20 points), updating was done quite often (5 out of 6 points), but forms were not found at all on the website. The third column indicates the values of a virtual benchmark. The virtual benchmark is formed by a linear combination of the benchmarks DMU9 and DMU17, depending on the output or input orientation with weightings 0.79 and 0.09

Table 4
Benchmarking Example for DMU35

	DMU35	Virtual DMU Output	Virtual DMU Input	DMU9 (O = 0.79, I = 0.15)	DMU17 (O = 0.09, I = 0.02)
Inputs					
Forms	0	0	0	0	0
Languages	3	1.8	0.3	2	2
Searchability	3	3	0.6	2	16
Travel preparation criteria	5	5	1.0	6	3
Updating	5	3.6	0.7	4	5
Outputs					
Number of visits	10,500	54,949	10,613	62,520	61,752
Number of e-mails	150	863	166	1,000	811

(output) and 0.15 and 0.02 (input) (see bold row in Table 3), demonstrating the improvement potential for DMU35. These identified DMUs are the best benchmarks for DMU35, whereby DMU9 has a much stronger weight than DMU17. It can also be seen that DMU9 is used seven times and DMU17 is used four times as a benchmarking partner for other DMUs (e.g., DMU14) independent from the orientation. The results also point out that the level of inefficiency and efficiency, as well as benchmarking partner for inefficient DMUs, are the same independent from output or input orientation.

The virtual benchmark clearly shows that DMU35 needs to improve its output significantly to be efficient as well in the number of visits and e-mails in the output-oriented model. The same is true for the real benchmarks DMU9 and DMU17 because their output in terms of number of visits is almost six times as high and the number of e-mail inquiries is much higher as well. The input orientation suggests decreasing the inputs, to keep the output at the same level, using the same benchmark DMUs as for the output orientation.

Conclusions

DEA was applied in this study to assess the efficiency of tourism organization websites. The DEA approach offers the opportunity to combine several inputs and outputs simultaneously. Furthermore, the DEA is a helpful positioning tool for websites of tourism organizations.

For example, inefficient DMUs are able to see how much of their outputs or inputs have to im-

prove to step up to being efficient. They could orientate themselves at their benchmarking partners to get ideas for improvement. Through the provision of benchmarking partners they are also able to focus on efficient best practices that are very similar to their organization. Identifying success indicators of the most efficient organizations can offer the less-efficient ones inspiration to enhance their performance and their future website developments. This exchange of knowledge could mean a general improvement in the sector's website progress, especially if used continuously in a monitoring manner. Furthermore, integrating organizational inputs and outputs in a website evaluation process can offer additional useful insights by considering the competitive offer and their efficient examples.

The limitations of the study are found in the weaknesses of the DEA and that the websites of the tourist organizations are likely to have changed significantly in the meantime. Although the data used might not be recent enough to allow an assessment of the website efficiency of the tourism organizations, the study aimed to show the appropriateness of the DEA as a benchmarking tool for tourism organizations' websites. As far as the weaknesses of the DEA are concerned, the selection of input and output factors plays a major role. Therefore, findings of this study are only applicable for the tourism organizations that participated in this study and the input and output factors selected. It has to be stated clearly that results might change when the above-mentioned conditions are varied. However, the inputs and outputs chosen in this DEA approach were done after thorough liter-

ature review and confirmation by regression analyses. A further possible limitation is that the results could change if additional DMUs are added. “Nondiscretionary” inputs that are hard or impossible to influence by the tourism organizations, like size of the city and tourists’ perception of the city, should be included. They have an impact on the outcome but there is no counterpart on the input side. Uncontrollable influences and environmental factors are particularly relevant to tourism. The geographical position, climate, or the cultural heritage of a destination cannot be controlled or influenced by the destination (Wöber & Fesenmaier, 2004).

Future benchmarking initiatives should include more tourism organizations. A possible difficulty is to convince tourism organizations to participate in this type of study because they are revealing a lot of their data (e.g., visitor numbers of their websites or frequency of updating). The availability of appropriate data is one of the main problems when applying benchmarking approaches for tourism organizations (Wöber & Fesenmaier, 2004). Furthermore, cooperation among the tourism organizations is needed when it comes to the application of best practices by inefficient DMUs, which might not be welcome by some destinations because they might fear to increase competitive power. A longitudinal study could investigate the long-term benefits of such a benchmarking approach by revealing how the tourist organizations’ websites improve over time by applying best practices.

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7 To investigate the digitisation status and use of e-Services in delivering heritage interpretation to improve interpretation and marketing

Mitsche, N. and Bauernfeind, U. (2008) The use of technology for cultural heritage interpretation – examples from three cities. *ATLAS Conference: Selling or Telling? Paradoxes in Tourism, Culture and Heritage*, Brighton 2-4 July 2008.

Mitsche, N., Reino, S., Knox, D., Bauernfeind, U. (2008) 'Enhancing cultural tourism e-services through heritage interpretation', in O'Connor, P., Höpken, W., Gretzel, U. (eds.) *Information and Communication Technologies in Tourism 2008*, Springer Vienna. 418-429.

7.1 Background & Innovation

The research presented is based on two papers which investigate the use of technology in relation to heritage interpretation. Cultural heritage has always played a big part in destination marketing, creating regularly distinctive and unique selling points for destinations (Prentice and Duncan, 1994) by attaching meaning to its physical attributes and to connect to visitors by enhancing their tourism experiences (Nyaupane et al., 2006; Timothy and Boyd, 2003). Interpretation is seen as a means of useful communication which supports visitors' discovery of meaning and which connects to the heritage presented (Herbert, 1989). It utilises elements of storytelling to be able to better connect with visitors (Tilden, 1957). Technology can be seen as a facilitator to distribute those messages more effectively to a wider and different audience, with the ability to support conservation efforts and overcome accessibility barriers (Buhalis and Darcy, 2011). As such, the papers provide an evaluation of the use of technology and heritage interpretation in the museum and destination context in its complexity by destination management organisations and their corresponding cultural heritage providers, to understand the current use, and identify best practices. The work was applied to inform the user requirements on the ISAAC project (Integrated e-Services for Advanced Access to Heritage in Cultural Tourist Destinations; EU project contract number FP6-IST-2006-035130), but it also provided interesting similarities about the connection of heritage

interpretation in the museum and destination context (Mitsche et al., 2013, 2008b; Mitsche and Bauernfeind, 2008).

E-services play an important role within tourism supporting the provision of information to consumers, mostly interactively via web sites. Different disciplines (e.g. computer or business science) have applied the term of e-services in a variation of interpretations. The term used in this context has been specifically applied to the purpose of the ISAAC project (ISAAC EU Project, 2008) which sits in the subject areas of computer, business and social sciences. It is defined as an interactive information exchange online with satisfied consumers, highlighting the strong consumer focus of e-services (Baida et al., 2004; Rust and Kannan, 2003). As such this area is embedded within eTourism and, in particular, the application and evaluation of web site technologies, but not always directly mentioned or defined as such (Mitsche et al., 2008b).

In parallel, (cultural) heritage attractions have recognised the value of information technologies situated on the site of the attraction as part of navigation or media used for interpretation of heritage and artefacts (Davies, 2001; MacDonald and Alford, 1991; Reino et al., 2007). Online, they have utilised it to engage stronger with their audiences, increasing their reach beyond traditional communication boundaries by providing accessibility to their collections online (Morbey, 2006), developing a more experiential 'we' presence (Loran, 2006), and even by developing new virtual museums independent from traditional physical boundaries (Carreras, 2006; Dietz et al., 2001; Schweibenz, 2004). Research illustrated that the use of technology media can enhance visitors' attention (Prentice et al., 1998) and, as such, offers opportunities to present heritage both professionally and in a user-friendly fashion at the same time (Go et al., 2003). As such, it has inspired new research ideas and projects (Beeho and Prentice, 1995; Epoch project, 2008; ISAAC EU Project, 2008; Mitsche et al., 2008b; Reino et al., 2007) and the development of new ideas and approaches in heritage interpretation using technologies (Blockley, 2006; Kalay et al., 2007; Parry, 2009).

The studies objective is to examine the digitisation status and the use of e-services in delivering heritage interpretation to improve interpretation and marketing and, as such, present a framework to evaluate the digitisation status of destination and cultural heritage attractions. The first study (Mitsche and Bauernfeind, 2008) presents the evaluation framework on digitisation and assesses the digitisation status of the three ISAAC cities Amsterdam (The Netherlands), Genoa (Italy) and Leipzig (Germany). The second study (Mitsche et al., 2008b) investigates the opportunities of technologies in heritage interpretation towards visitor satisfaction in the context of a visitor survey and an investigation of online best practice examples.

7.2 Methodology

The two papers presented are based on research of the ISAAC project (ISAAC EU Project, 2008). It evaluated the current use of technologies and eServices by destination and cultural heritage providers as a first step to provide a better understanding of both sectors. The objectives of both papers were to provide an understanding of the current use of eServices and technologies by destinations and cultural heritage providers and to investigate the use of e-Services in delivering heritage interpretation to improve interpretation and marketing.

The first paper (Mitsche and Bauernfeind, 2008) evaluated the current use of eServices by destinations and cultural heritage providers with regard to heritage interpretation in the cities of Amsterdam (The Netherlands), Genoa (Italy) and Leipzig (Germany). It applied a classical triangulation approach and combined three different data collection and analysis approaches within those cities. The web site content analysis uniquely combined an expert evaluation questionnaire and investigated web site usability with additional heritage interpretation criteria on 15 destination and cultural heritage web sites of each city. This data was analysed through descriptive analysis and statistical testing, such as chi square test for significance, as well as discussing the best practice examples collected during the evaluation process. The data was further enhanced with findings interviews with 6-8 destinations and cultural heritage providers reflecting on the interpretation of

cultural heritage and interpretative media online and on site as well as on their web page. The third part of the triangle in data collection was structured observations of local cultural attractions in each city, evaluating on their applications of interpretative media and, in particular, technology applications within it.

Parallel to the expert evaluations of the three cities' destination and cultural heritage web sites further evaluations were conducted on English, German, Italian and French destination and cultural attraction web sites to develop a reference framework for the digitisation status of the cities and identify best practice examples.

The second research paper (Mitsche et al., 2008b) explored forms of effective heritage interpretation in terms of its contribution to visitor satisfaction and overall experience and through identifying and comparing the role of technologies within it. It does this based on a visitor survey in two different museums. It further links those to an evaluation of best practice examples collected with the previous expert evaluations to explore the opportunities for integrating heritage interpretation elements within the online provision for cultural attractions and destinations.

The approach is limited as it is a snapshot of the time, and the individual web sites and best practice examples change continuously. Care was given in the selection process of the different web sites, and destination web sites evaluated were official representations of their countries. The links were obtained from the two main European bodies Visit Europe from a country perspective and Visit European Cities from a city perspective. A number of published lists from research conferences (Museums and the Web Online, International cultural heritage and web) and lists of popular attractions were the basis of the selection process for cultural attraction web sites.

7.3 Findings & Contribution

The papers contributed to understanding of the digitisation status and use of e-Services in delivering heritage interpretation to improve interpretation and marketing by providing

- A framework to evaluate digitisation status of web sites
- Establishing the position of cities within this framework and provide specific recommendations for cities
- Provide information to support the generation of user requirements for the ISAAC prototype
- Reflection on the influence of heritage interpretation on visitor satisfaction and perception
- a reflection on target group focused interpretation
- and active rather than passive interpretation
- insights into the opportunities of heritage interpretation as a means to communicate interpretation and as a marketing instrument

7.4 Summary & Response to objective

The main research objective of this collection of research papers is to investigate the digitisation status and use of e-Services in delivering heritage interpretation to improve interpretation and marketing. The research outcomes provide a framework to evaluate digitisation status on web sites, which can be also applied and adapted outside the destination and cultural heritage sector. The results further highlight the varied opportunities technologies provide for cultural heritage attractions (Mitsche et al., 2008b; Mitsche and Bauernfeind, 2008), and the opportunities heritage interpretation elements provide for destinations in exchange.

This meets the objective by providing an evaluative framework for the digitisation status in delivering heritage interpretation and reflection on best practices, and provides examples and opportunities to improve the interpretation itself and marketing strategies of destinations.

7.5 Papers

The use of technology for cultural heritage interpretation – examples from three cities

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Introduction

Cultural heritage is essential for tourism and for destinations in particular (Prentice & Duncan, 1994), and in order to become more engaging and understandable to visitors meaning needs to be attached to it. This can be achieved through interpretation which is the communication process or knowledge transfer involved in adding meaning when trying to make visitors appreciate sites (Harvey, 2001). The use of technology to better convey meanings of cultural heritage is becoming increasingly important, enabling the enhancement of visitor experiences to cultural heritage sites (Stevens, 1989).

In this context this study investigates how European cities apply technology to increase accessibility and understanding to their cultural heritage. Three cities, Genoa, Amsterdam and Leipzig, served as case studies to learn more about their technology use in terms of heritage interpretation. Cultural attractions, in most cases museums, were selected in close cooperation with city partners (tourism organisations and city administration). The evaluation of their technology use was done by assessing the respective attractions' web site, by conducting interviews with the attractions' managers and observing the use of technology by visitors at the attractions. Identifying the current status of technology usage in the three cities also allowed suggesting good practices. Innovative applications of technology use were found which could be inspiring for other cultural attractions. Furthermore, problems in using more technology applications to facilitate heritage interpretation will be outlined.

This paper is organised as follows: Section 2 will outline the importance of cultural heritage interpretation and how technology could facilitate interpretation and enhance the visitor's experience. In Section 3 we will elaborate on the methodology used to assess the status of technology usage in the three cities. In Section 4 we will present the findings of our study. The final section is dedicated to the conclusion as well as the implications of our study. Furthermore, directions for further research are given.

Heritage Interpretation and the Use of Technology

“Interpretation may be defined as the facilitation of insight through the identification and explanation of what may be seen or imagined at a place” (Prentice, 2001). Heritage

interpretation is about transmitting appreciation or enthusiasm for a place which is thought to be special to people. It does not necessarily have to be a place, it could also be a building, cultural life, a town, an event or an activity. Importantly there is a difference between information and interpretation, the first provides just facts whereas the latter is intended to give some new ideas and insights of artefacts and cultural heritage (Carter, 2001). Prentice and Cunnell (1997) see interpretation also as an activity used to present a message, or to facilitate an experience within attractions. Although it is regularly seen as a form of providing information, it is actually much more, a communication instrument which attempts to make information and the heritage behind it meaningful. Tilden (1957) divides interpretation into two concepts; the revelation of a larger truth behind any facts, and taking advantage of peoples' curiosity in order to enrich their minds.

Traditionally, in particular museums, focused on preserving and exhibiting artefacts, providing only basic information. Today they are measured by different outcomes, providing a mix of enjoyment, learning and experience (Moscardo 1996), but also satisfaction, profitability and sustainability (Go, Lee, & Russo, 2003). Heritage interpretation can be seen as a management technique for cultural heritage attractions facilitating these additional values and meanings through a variety of different presentation and animation techniques to enable the access and use of cultural heritage (Izquierdo Tugas, Juan Tresserras, & Matamala Mellin, 2005). The least interactive interpretative media are paper-based material, such as books, leaflets, pictures and information boards or audio tours and video installations, where the communication process of interpretation is one way to the visitor. Interactive media as for example live interpretations or guided tours include and engage the visitors in the interpretation process enabling them to create their own interpretation of artefacts, stories and the cultural heritage experienced.

The application of interactive media increases the level of entertainment and engagement of visitors and entertainment and interactive displays have been also considered to enhance visitors' interest, and therefore, mindfulness and learning outcomes (Moscardo 1996). In a case study of Prentice et al. (1998a), the authors found that the use of media such as films or audio sources could enhance the visitors' attention. ICTs (Information and Communication technologies) have been identified to offer opportunities for heritage to be presented in a user-friendly and sophisticated way (Go et al., 2003) engaging visitors interactively, in particular as technology-mediated heritage interpretation has been suggested to increase interactivity (Moscardo 1996) similarly achieved through live interpretations in museums (Beeho and Prentice 1995). This is not only beneficial for visitors, but using information and communication technologies (ICTs) to transmit the heritage message can also improve the performance of businesses and destinations (Go et al., 2003). More and more studies are examining the possibilities which information technologies hold for heritage interpretation (Beeho & Prentice, 1995; MacDonald & Alford, 1991; Veltman, 2005) even possibly competing with the entertainment industry (MacDonald & Alford, 1991, 1995).

Benett (1999) identified a selection of factors encouraging the adoption of technology, such as interpretation, enhancing visitor experience, competition advantage, cost savings (long term), authenticity and management efficiency. So far, the use of technology for interpretation has

been of an audio-visual nature, but the effectiveness of technology over traditional tools is in Bennett's opinion still debatable. The novelty of technology is one mean to introduce a degree of entertainment to enhance visitor experience which is part of the broader remit of today's role of heritage (Bennett, 1999). Introducing technologies raises a number of important issues which have to be addressed before adapting technology in an effective way for heritage interpretation. "The media becomes the message" meaning that interpretation itself is hijacked by the media which presents the interpretation, and instead of being customer-led it is actually designer-led (Stevens, 1989). However, by making sure that the technology does not overpower the interpretation it can enable the enhancement of visitor experiences (Stevens 1989).

At the end of a visit the interpretation message should be learnt, understood and taken in by the visitor. The method of delivery should not be the focus. Evaluation of the interpretation media is therefore essential to determine if the intended role is fulfilled, as to determine accountability and cost-effectiveness (Prentice & Light, 1994). Cost-effectiveness becomes an important issue, especially in the context of virtual reality (Bennett, 1999). As visitor learning is one of the intended aims often mentioned (Prentice et al., 1998a) the non-achievement cannot always be projected on the media transporting the message, but also relates to visitor motivations (Bennett, 1999). Achievement on its own does not determine the fulfilment, but a combination of learning achievement and satisfaction based on motivation is essential.

Distribution and access issues occur in relation to technology, offering new distribution channels, and making cultural heritage and heritage interpretation more accessible through the Internet and CD-ROMs, but also off-site and on-site through access to collections not accessible on site to the public. But this raises the issue of technology apartheid, where the access is more difficult for the techno-poor (Bennett, 1999).

Virtual reality is criticized intensively, and often seen as a threat to the actual cultural heritage sites, destination and the holiday experience. But studies showed that virtual reality cannot substitute reality, as sights, sounds and smells can never replicate in that extent. Rather than a threat it is more a stimulation for the "real thing" (Bennett, 1999).

Technology for heritage interpretation can be adapted on-site, or off-site. The more obvious one is on-site, using technologies such as audio/visual, 3d/4d multimedia, touch screens, virtual reality as multimedia information. These enhancing tools can help the visitor to develop a greater understanding of the past (Bennett 1999). Grinter et al.(2002) approached the effectiveness of technological appliances, examining visitor's use of mobile audio and visual devices. Through interviews their study brought insights in understanding of how certain types of devices might enable social interactions when visiting a museum. Virtual reality applications could facilitate the dissemination of cultural heritage (Go et al. 2003). Alfaro et al. (2004), Goren-Bar et al. (2005) and Graziola et al. (2005) introduced cinematic techniques in multimedia guides in their so-called PDA peach project. The audio presentation in a multimedia museum is complemented by a PDA showing pictures and using cinematic techniques. Animations and video clips enrich the experience and interaction and create spatial and textual cohesion (Alfaro et al. 2004).

The Internet holds a large potential for off-site interpretation. MacDonald and Alsford (1991) discuss access and distribution opportunities for different sources such as libraries, archives, historic sites or museums. Schweibenz (1999) describes different categories of online museums – the brochure museum, the content museum, which presents object-oriented museums’ collections, and the learning museum. In the learning museum, information is provided context oriented, offering different access points and motivating visitors to learn and to revisit the sites. The virtual museum, which is the next development step after learning museums, links not only to one museum’s collection but also to others – referred to as “the museum without walls” (Schweibenz, 1999). Virtual museums open potential discussion, being felt a threat to traditional museums. But similar to the appropriate use of technologies on-site, these web sites actually enhance the offer of traditional museums, opening them to a wider audience by providing easy access, being even seen as an additional branch (Loran 2005) but also used as a marketing tool.

Methodology

The goal of this study is to gain knowledge on the digitisation status of cities, their destination organisations and their cultural attractions with regard to the facilitation of heritage interpretation. Furthermore, the identification of best practices as a part of the research process should enable inspiration and improvement opportunities. In each of the three cities (Amsterdam, Genoa, Leipzig) a selection of interviews and observations were conducted on site, and enhanced by a web site evaluation off site.

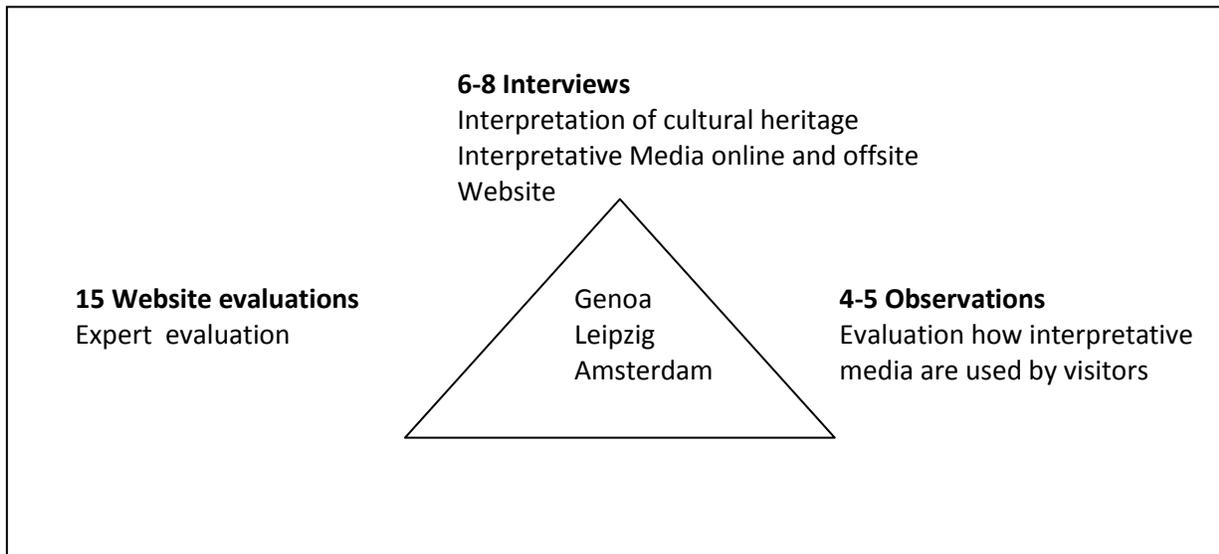


Figure 1. Research methods used in this study

The personal in-depth interviews were carried out to get an insight into heritage interpretation efforts in each city, with the aim of evaluating the significance of interpretation and technology for the cultural institutions (mostly museums) and tourism offices. The interviews included

questions about whether heritage interpretation is an issue for the attraction's or tourism office's manager/employee at all. When interviewees identified heritage interpretation as an issue, they were further asked if technology is applied and how. In the case they refrained from using technology and interpretative media they were asked to indicate the barriers and problems for doing so. Another question targeted the importance of the website and if the website is predominantly used for information dissemination or online heritage interpretation as well.

The on-site observations conducted investigated the use of technology by the visitors within cultural attractions. The main focus was whether the visitors used technology based media at all. If that was the case it was observed how much time they spend with the respective media and if there were any clear reactions to observe (e.g. interest, curiosity, confusion about how to use the device).

The websites of the cultural institutions selected by the cities were evaluated and compared in the context of a larger expert web site evaluation which included 105 destination and 55 cultural attraction web sites (Mitsche et al 2007). Web sites were analysed by experts on the basis of 2 different tasks, which included both the tourist and resident perspective, to enable in depth engagement of the selected destination and cultural attraction web sites. The web sites were evaluated according to their representation of heritage interpretation, the use of (interactive) tools and different media. Learning experiences and entertainment in relation to heritage interpretation were assessed. In addition with other important website characteristics such as content, usability, design, functionality issues and overall satisfaction were assessed as well. The evaluation of media included whether pictures, videos, virtual tours, sounds, maps, stories, games, 3D models and chat rooms were provided at the website. Learning experiences were measured by criteria such as "The website established a link between historical facts and realities today", "The messages were linking to the place" (Copeland and Delmaire 2004, Tilden 1957,) or whether any learning material was provided (Copeland and Delmaire 2004, Tilden 1957, Beeho and Prentice 1995). The measurement criteria for entertainment and enjoyment experiences were based on the websites' offer of variety, inspiration, fun and further, the degree of provoking interest and curiosity. (Novak et al. 2000, Agarwal and Karahanna 2000, Shang et al. 2005, Baumgartner and Steenkamp 1996, Johnston and Rennie 1995, Copeland and Delmaire 2004, Tilden 1957). Content evaluation included the availability of basic information, linguistic offer and usefulness of information. The website assessment of usability, design and functionality was conducted by applying a usability questionnaire (Lewis, 1995) which presents a standard evaluation questionnaire widely used for website assessment. The form of assessment was an expert evaluation conducted by members of our research team.

Results

First, results for each of the different research methods will be outlined followed by a summary of good practices found in the cities and their cultural attractions.

Interview results showed that heritage interpretation is an issue and most of the museums see it as part of their primary function. Heritage interpretation helps to uncover entertainment and

education aspects which are facilitated by the use of technology in order to better convey the message. Audio guides are a particular popular media enabling to target different groups of visitors (e.g. offering different guide versions for adults and children or longer and shorter audio tours). Personal stories and storytelling were mentioned as an efficient mean to facilitate heritage interpretation. Although the importance of technology to facilitate heritage interpretation was widely acknowledged, a few interviewees highlighted that for many visitors personal contact and guided tours still play a major role for their experience.

The majority of the interviewees would like to use more technology based media to better present the heritage and convey the messages. However, they experience barriers and problems keeping them from exploiting technologies to their full extent. The most common and obvious reason mentioned was the lack of financial resources. An obstacle, closely connected to finances, is the lack of skilled personnel to deal with and maintain technology based applications. Frequent technical problems with existing media discourage them from acquiring more technological based applications. Visitor preferences (particularly the age group 50+), to have personal contact with the attraction's employees instead of using interactive media, is also keeping them from introducing more technology oriented interpretation.

Interviewees use the web sites of their cultural organizations mainly for information dissemination and the purpose of attention attraction, marketing and promotion. They also mentioned an educational purpose, which supports interpretation purposes. Few of the museums' web sites offer online views of their artefacts and their descriptions. The majority of the interviewees saw the opportunity to get into a dialogue with their visitors and to receive their feedback. All of the institutions interviewed do some kind of web site measurement, most museums collected statistics about their web site (e.g. number of visitors) or even user studies (user evaluations, feedback questionnaires). The majority makes use of this information to develop and change the site further according to users' suggestions. The statistics collected often hint to problem areas or particular popular pages which would be worth to be extended or improved.

Most of the web site owners were very ambitious in planning to either set up a complete new system or to accomplish a major re-design or re-style of the current version of the web site. This is also reflected by the problems and shortcomings interviewees indicated regarding their web site. Often they described their web site as rather old-fashioned or too weak in terms of entertainment level. Examples for major changes planned by some institutions are online bookings and higher accessibility for visually impaired people. One of the cultural institutions is planning to divide the web site into a commercial and a scientific part whereby the commercial part contains practical information, booking facilities and other online services and the scientific part illustrates and teaches the contents of the museum.

The observations showed that the majority of the museums use a variety of interactive media. The most common was certainly audio support either in the form of an audio guide or by playing music in the exhibition rooms to further enhance the overall experience. Video/TV terminals are also popular though the observations demonstrated that visitors tend not to use

them when the museum was very crowded (and they had to queue to access to the terminal). Internet terminals were hardly used particularly when the PC appeared to be turned off, but if they are turned on are attracting attention. However, looking at reactions of people they were quite varied - ranging from disinterest to interaction to fun.

Overall, the observations conducted showed in general that interactive media attract attention in the first place. However, their use and the duration of use depend on the specific media. One observation on an interactive tool consisting of video and voting facilities was conducted. This media seemed to attract a lot of interest and participation among visitors. Votes on humanity issues (which is the topic of the museum) were collected, summarized and compared to the votes of all visitors. This tool encouraging interactivity did not only attract huge interest among visitors but also kept their interest for a considerable amount of time (most of visitors staying and interacting for more than 20 minutes).

Table 1: Comparison of heritage interpretation on cultural tourism attraction web sites between the good practice survey and the 3 cities (percentages presented are “strongly agree” responses)

Questions	Cult. attractions good practice (n=65)	Amsterdam (n=10)	Leipzig (n=16)	Genoa (n=8)
Entertainment and Enjoyment Experiences				
The visit of the web site offered variety.	58.5 %	22.2 %	9.1 %	33.3 %
The web site can inspire users.	44.6 %	33.3 %	9.1 %	33.3 %
The web site enables curiosity.	46.2 %	44.4 %	9.1 %	33.3 %
The web site has elements which are provoking interest.	52.3 %	44.4 %	18.2 %	50.0 %
The web site has fun elements.	33.8 %	22.2 %	9.1 %	33.3 %
Track of time is lost easily while using the web site.	33.8 %	33.3 %	9.1 %	16.7 %
Generic experiences				
The web site enables to establish quickly a familiar feeling.	33.8 %	55.6 %	36.4 %	66.7 %
The web site allowed understanding heritage related to the place better.	47.7 %	55.6 %	45.5 %	50.0 %
Learning experiences				
A link was established between historical facts and realities today.	42.2 %	55.6 %	45.5 %	40.0 %
The messages were clear and easy to remember linking them to the place.	55.4 %	66.7 %	45.5 %	50.0 %
The web site visit was informative.	58.5 %	55.6 %	45.5 %	50.0 %
The web site provided learning material related to the place.	35.4 %	55.6 %	18.2 %	33.3 %
The web site provides material deeper and hidden meanings related to the place on the web site.	29.2 %	33.3 %	9.1 %	16.7 %
The web site used stories and themes to convey a message related to the place.	36.9 %	33.3 %	9.1 %	16.7 %
The audience’s participation is sought by getting to use their senses.	27.7 %	44.4 %	9.1 %	50.0 %

Website evaluation results

The data collected from the 3 cities was compared to data collected which established an overall status of good cultural heritage attraction web sites. The main study (expert evaluation of 65 good cultural heritage tourism web sites in English, German, Italian and French; Mitsche et. al. 2007) highlighted that overall cultural attractions use their web site mainly to disseminate information. For most museums' websites the linguistic offer was satisfactory to excellent. Only few had the shortcoming of showing the content of their web site in the country's language only. Several of the museums offer an online group booking request, an online feedback form and the inquiring possibility for the electronic delivery of a newsletter on their website. Interpretation, learning, the use of interactive media was an issue for only few of them showing some of their artefacts on the website or providing stories related to the heritage.

The web sites of each city were compared to the good practice cultural tourism attraction web sites. Table 1 presents the results from the heritage interpretation perspective. From the three cities Amsterdam was the most advanced, followed by Genoa and Leipzig. Shortcomings were identified for Amsterdam with slightly worse evaluations for the variables enjoyment, variety and entertainment. When it comes to the linguistic offer, Amsterdam takes a lead role. Similarly Differences arising from the comparison were that Genoa's attraction web sites resulted in slight differences concerning variety, learning (offering materials with deeper and hidden meanings). Genoa's attraction web sites applied stories less often. Leipzig's attraction web sites need to catch up regarding entertainment/enjoyment and learning experiences. It is interesting to mention that Leipzig's web sites were also compared to the Leipzig sub sample, and no differences were found between these two samples regarding heritage interpretation.

Good practices for heritage interpretation identified during the observations and interviews were the use of personal stories, the application of audio guides and the use of recognition effects to achieve better learning results. Furthermore, interactive participation of visitors showed to be a very promising effort. According to some interviewees personal stories enable the visitor to connect more with a particular time or circumstances. The application of audio guides is successful because different stories can be told to different visitors and can be used completely flexible by the visitors according to their interests and time. One city had very good experiences with offering activities specifically for children and attracting also their parents, resulting in a higher number of visitors. Some interviewees had a very innovative point of view concerning the web site. It should provide much more than simple information. In fact, the web site should be a virtual showcase of the museum's content. One city had a common portal for many museums showing a good example of how promotion and marketing efforts can be bundled in an efficient way. When the user moves on to the individual web site the navigation path is the same among all sites facilitating their use. However, there is a distinctive design of the individual web sites to enable the museums to differentiate themselves from each other.

Conclusions

The evaluation of destinations' and cultural tourism' web sites examined the application of technology, heritage interpretation and the use of interpretative media on web sites as well as on-site, in the museums. Technology can enhance the visitor's experience as well as improve the efficiency and attractiveness of the cultural attraction.

This study aimed to explore technology usage by conducting interviews, observations and a website evaluation in three different cities. Combined findings of the three data collection methods indicate a high awareness level of the importance of interpretation by the cultural institutions and tourism offices. However, digitisation varies strongly from city-to-city and from institution-to-institution. Often the use of more interactive media on-site is inhibited by a lack of time and financial resource. The websites of the cultural institutions are mainly used for information dissemination and not yet aimed at enabling visitors to experience a deeper understanding of the heritage. However, some innovative ideas were utilised at some of the cultural heritage sites in the cities and on some of the related websites. In conclusion, the nature and means of interpretation continue to be important issues in cultural heritage management, and although technology and interactive media offer a number of opportunities, they are not yet being adapted to their full potential.

This framework explores the digitisation status of cultural heritage in destinations from a variety of angles, enabling them to understand their current standing and comparison to other destinations. The identification of problems or barriers in using more technology showed that the problems found apply to the majority of the cultural institutions. However, attitudes and opinions whether to replace personal contacts in the museums by technology vary from city to city. Good practices could inspire cultural institutions and cities to implement similar innovative applications in their museums or on their website as well.

The nature of the study relying on selected case studies and a limited amount of interviews, observations and web site evaluations does not allow for a generalization of the findings but rather gives an insight of current practices and perceptions. Furthermore, an evaluation of the web sites by more than one expert and/or end users could provide further and more detailed results. Including more cities would also give a broader picture of the technology use for heritage interpretation.

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Enhancing Cultural Tourism e-Services through Heritage Interpretation

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Abstract

Cultural heritage is a major contributor to tourism development. Cultural heritage tourism relies heavily on the communication process for attracting visitors and providing them with a satisfactory experience. The tourist encounter can be significantly enhanced through effective and engaging heritage interpretation. This paper argues that there are opportunities for the application of e-Services in the delivery of heritage interpretation through the Internet – optimising results for the fulfilment of both marketing and interpretation purposes. This paper investigates visitor satisfaction with museums, and explores the use of e-Services for both cultural attraction operators and destination managers over a two-stage empirical investigation. Firstly, this study identifies the contribution of heritage interpretation practices to overall visitor satisfaction in museums, and to the best and most memorable experiences during such visits. Secondly, the paper evaluates the current integration of e-Services in cultural attraction and destination websites. The results are integrated and developed into practical industry implications for cultural attractions and destinations websites offer of online heritage interpretation.

Keywords: eTourism, ICT & heritage interpretation, destination & cultural attraction websites.

1 Introduction

Tourism relies on cultural heritage as a source of visitor attractions and for the development of the destination image (Prentice & Duncan, 1994). In turn, cultural heritage needs to be provided with meaning in order to acquire an exchange value. Such meaning is related not only to the physical attributes of the exhibited artefact,

but also to its historical and/or cultural aspects, which require some kind of teaching or knowledge transfer to enable visitor appreciation of the site (Harvey, 2001). This communication process in the context of cultural heritage is known as heritage interpretation – a process which starts as soon as the potential visitor obtains information on the heritage site, frequently taking place before the visit starts and finishing with the last information collected on the exhibit, or even once the visit is completed. In this sense, heritage interpretation refers to the communication process which reveals meanings and relationships based on historical facts, allowing visitors to obtain, understand and potentially remember information (Aldridge, cited in Copeland and Delmaire, 2004; Sigala, 2005).

Information and Communication Technologies (ICT) facilitate the dissemination of information from remote locations, enabling heritage operators to take control of the information their visitors obtain before, during and after their visits take place. This potentially extends their provision of heritage interpretation to the three stages of the tourism life cycle. E-Services – the provision of services based on an interactive information exchange over an electronic network (Baida et al. 2004; Rust & Kannan, 2003) – have been previously applied to museums for heritage interpretation. Furthermore, there is previous work assessing the opportunities arising from these applications including wireless networks and other electronic environments such as kiosk systems to heritage sites. However, there is still only limited research exploring the opportunities for heritage interpretation over the Internet. According to MacDonald & Alford (1991) heritage sites have a duty, intrinsic to their nature, to disseminate information on their exhibits both onsite and offsite. The Internet widens these opportunities for remote accessibility. Therefore, this paper presents the results of a two-stage study that explores opportunities for offsite heritage interpretation over the Internet – through the use of e-Services. The study firstly identifies the attributes of heritage interpretation contributing to satisfactory onsite visitor experiences, and secondly it explores current forms of online e-Services, and how they either fulfil or do not fulfil these attributes. The study concludes with an outline of the e-Services potential for heritage interpretation, and recommendations for integration into destination and cultural attraction websites.

2 Background

Destination is a construct of personal factors, previous experience and information sources (Baloglu & McCleary, 1999), and of the overall destination and its content by way of accommodation, transport and cultural heritage attractions (Pike, 2002). This relates to Prentice & Duncan's (1994) suggestions on the desirability of heritage tourism going beyond the attraction level, and generating information which helps not

only to enhance the experience on the heritage site itself, but also to frame the destination image and to widen the tourism opportunities for the region.

In opposition to Lowenthal's (1998) and Hewison's (1989) apprehension of heritage as being about physical and innate characteristics, Harvey (2001) considers the essential attributes of heritage to also be related to discourses and interpretation. He regards heritage as a "value-loaded" term, the concepts of which change according to the contemporary contexts of power relationships and national identities, making the bridge between the exhibition and our realities. Therefore, heritage is a construct comprising different dimensions, which includes not only the physical attributes of the artefact but also a set of values together with the cultural identity that the artefact represents. The process of interpretation is intrinsic to the term heritage, whether this is provided by the heritage operator or sought by the visitor individually; and whether this is obtained before the visit, afterwards or onsite. Heritage acquires its value when the asset is provided with meaning, which implies the need for interpretation. By delivering their service online, e-Services widen the opportunities for cultural heritage websites through allowing their operators to extend their interpretation offsite, taking an element of control over information provision, and enabling them to integrate communication activities of the cultural attraction within its offsite interpretative plan. Furthermore, integration within destination websites' content creates new marketing opportunities for the destination.

The range of e-Services which have been implemented in tourism websites – including product aggregators, destination websites and individual providers' sites – comprises a wide variety of tools such as recommender systems (Ricci, Fesenmaier, Werthner, & Wöber, 2006; and Zins et al, 2004); information on "how to get there" (Bernstein & Awe, 1999) or virtual tours (Breitenbach & Van Doren, 1998) and their potential to engage with visitors has been researched over the last decade. Reino, Mitsche and Frew, (2007) suggest that combined with other interpretative techniques, technology enhances visitor satisfaction in museums. However, their work does not identify the attributes involved in the provision of satisfaction experiences through heritage interpretation. There is previous research looking into ICT for onsite and offsite heritage interpretation. Within onsite interpretation, the work developed by Rocchi et al. (2004) suggest the use of electronic devices for heritage interpretation, such as guidebooks, cinematics or a combination of multimedia applications. Additionally, research into tools applicable for both onsite and offsite interpretation includes Beraldin et al. (2005)'s account of the role of 3D multimedia for cultural heritage interpretation. In terms of content, Raptis, Tselios and Avouris (2005) highlighted the importance of the content when using electronic devices for heritage interpretation. However, the insight provided by all these projects into the satisfaction outcomes – through learning, entertainment & experience – of heritage interpretation is very limited. Heritage interpretation approaches and their intended outcomes vary

in accordance to museums' and heritage sites' paradigms. If their interpretative provision was originally purely oriented to conservational purposes, they have progressively evolved towards a more educational curatorship approach (Light, 1995; West, 1988). Originally considered as incompatible with learning, enjoyment and experience-related outcomes were introduced when assessing heritage interpretation due to the evolution of learning theory, which suggested a positive relationship between these two potential outcomes and learning (Moscardo, 1996). This led to a multidimensional concept of learning, in which fun and inspiration are part of individual development and a life-long learning process (Hooper-Greenhill, 2004).

3 Methodology and Results

This study aims to explore the opportunities that the integration of heritage interpretation through e-Services generates for cultural attraction and destination websites through a two-stage research project. Previous research has developed a framework for the evaluation of heritage interpretation practices over the Internet, based on a constructivist educational perspective, and identified a lack of visitor-centric experiences (Sigala, 2005). However, the outcome-driven climate currently dominating cultural attractions, led both by accountability and social value (Hooper-Greenhill, 2004) suggests the need to evaluate heritage interpretation practices based on a demand-driven approach. This perspective has been adopted for this study.

The first part analyses visits to museums and forms of effective heritage interpretation for visitor satisfaction. In this sense, the effectiveness of heritage interpretation is measured in terms of its contribution to the overall visit and to the best experience within this visit, and the role of ICT to the achievement of positive experiences is evaluated. The literature on heritage interpretation (Copeland and Delmaire (2004); Prentice, Guerin & McGugan, (1998); Beeho & Prentice (1995); Reino et al. (2007)), together with observations at four different locations supported the development of a questionnaire. Reliability was assured through a pilot with four subjects. The second part of the study explores e-Services already provided through cultural and destination websites and their potential use of these e-Services for heritage interpretation. Finally, the results from both studies are combined and the potential opportunities and implications for cultural attraction and destination websites are provided.

3.1 Visitor Survey

A 168 questionnaire set was distributed in two museums – 81 at the Discovery Museum (<http://www.twmuseums.org.uk/discovery/>) and 87 at Bede's World (<http://www.bedesworld.co.uk/>), collecting quantitative data in relation to visitor satisfaction with heritage interpretation and with their visit overall. The selection of

the museums was related to the convenience of their location – both based in the Northeast of England – as well as to the variety of interpretative media they provided in their exhibits, including not only traditional interpretative devices such as posters and labels with information, but also technology-based and live interpretation. The first part of the questionnaire looks into visitors’ experience in the museums in terms of the different outcomes of heritage interpretation which have been identified through the literature review and observations. This is followed by questions examining the best experience of their visit – aiming to identify those physical, emotional and interpretative elements which comprise that experience. Following this, visitors’ overall satisfaction and the satisfaction with the interpretative media used were recorded, as well as information on the demographics – age, gender and place of residence to identify potential differences.

The results show that in terms of the heritage interpretative provision, a high percentage of visitors (64.8%) reported being very satisfied with the information material in both museums and also with one of the games included in the Discovery Museum’s interpretative provision (62.1%). Pictures (52.1%), exhibited objects (48.8%), interactive exhibit parts (42.9%), stories through speakers (39.3%) and videos (35.3%) were also perceived as satisfactory but at a lower percentage. These satisfaction results with the different interpretative media used were linked to the overall degree of satisfaction with the museum ($p < 0.05$). The only non-significant result related to the exhibited objects, underlining the fact that the explanation and interpretation of objects is very important for achieving visitor satisfaction, and suggesting that the interpretative provision has a key role in the overall museum visit and therefore the relevance of the media in the presentation of heritage.

Table 1. Visitor Satisfaction with Heritage Interpretation

<i>Experience</i>	<i>Strongly agree & agree</i>		<i>Sign</i>
	<i>Very satisfied</i>	<i>Satisfied – not satisfied</i>	
I had fun.	88.7%	71.4%	0.001
This museum inspired me.	89.6%	68.0%	0.000
I saw the links between the past & our lives today.	87.8%	77.4%	0.020
I found things which were similar to my life.	77.4%	62.0%	0.016
I understand the past better.	95.5%	87.7%	0.003

In order to identify the different elements that determine visitor satisfaction, a crosstabulation was produced which looked at percentages of satisfied visitors with the different attributes of heritage interpretation. Furthermore, in order to test the strength of the relationships between paired variables, the Mann Whitney U significance test was applied. Table 1 presents the results of visitor satisfaction with the heritage interpretation according to the different outcomes – learning,

entertainment and experience. The results indicate that overall satisfaction with the visit to the museum is highly related to the heritage interpretation. In more detail, visitors who experienced fun, or were inspired, were able to appreciate the links between the past and their lives today, and/or developed a greater understanding of the past, were more satisfied.

Table 2. Heritage Interpretation Preferences Related to Visitor Profiles

<i>Motivations for the Museum's Visit</i>	<i>Tourists</i>	<i>Residents</i>	<i>Sign</i>
I like if the museum inspires me.	79.4%	66.1%	0.006
I came here to experience the stories the museums tells about its time.	87.7%	62.1%	0.002
I came here to see the links between the past and our lives today.	78.5%	62.7%	0.012
I like to compare things from the museum with things I knew and experienced before.	57.6%	79.2%	0.001

Table 2 shows interesting differences related to the visitor profiles divided by variables such as residents/tourists and age. Residents were clearer on the motivations which brought them to visit the museums, reporting in higher percentages a motivation related to an aim to obtain inspiration, to live an experience, to find links between the past and our lives today, or to compare with previous experiences. Furthermore, their experienced outcomes were stronger, reporting higher percentages of achieved inspiration (88.8% residents, 73.3% tourists), learning outcomes (91.3% residents, 85% tourists), finding things familiar to their life (89.7% residents, 75% tourists) and a feeling that they understood the past better (81.3% residents, 56.7% tourists). These differences might be based on the different knowledge that residents and tourists would have in relation to the local history that formed some parts of the exhibitions. This indicates the role of cultural identity in motivating visits to heritage sites – more present in residents than in locals – and the relevance of knowledge acquisition on the exhibit and importance of interpretation. Age-related differences reveal diverse technology acceptance levels and therefore preferences for different interpretative media. Visitors under 40 years showed a higher satisfaction with the interactive exhibits and playing games, whereas visitors over 40 showed higher satisfaction with the written information material provided. This reflects the need to customise sites and to consider the different technology acceptance by visitors.

The “best experience description” showed that these experiences involved “having a friendly or welcoming atmosphere” (92.8%), “listening and/or watching” (92.7%), learning something new (92.1%), actively doing something during this experience (72.8%) and comparing the situation with something known and/or experienced before (69.6%). Less relevant attributes relate to “the situation being funny or involving jokes” (48.3%) and to feeling passive (44.2%). In terms of the interpretative

elements which were involved in these experiences, the following attributes were present in a high percentage of “best experiences”: exhibited objects (84.4%), followed by non-technology-based interactive objects (76.4%), text (76.6%), pictures (74.9%), sound (74.3%) and touch – only asked in Bede’s World as this attribute was not available in the other museum – and were reported as important parts of the experience (67%). On the other hand, technology-based interactive objects (55.1%) and games (46.1%) were regularly noted as attributes of the best experience. Surprisingly, live interpretation – a member of staff explaining – was not mentioned as forming part of the “best experience” by many people. Only 4.6% consider performances by actors as very important that could be due to the limited availability of this interpretative resource in these museums, as well as to other elements of the communication process, such as the visitors’ attitude towards the communicator (Scott Morton, 1991).

3.2 Website Analysis

Interpretative media as described earlier are often used in an interconnected manner within e-Services. Some of these e-Services use heritage interpretation combined with different interpretative media to provide information, but also to engage web users for longer on the site, enhancing fun factors, the general experience of the site and increasing knowledge related to the attraction or destination. An expert evaluation of cultural tourism attraction and destination websites was developed for the identification of e-Services that are already integrated into these websites and to explore how they could be used for heritage interpretation. The website selection responded to their search engine optimisation, to their balance between content, technology and e-Services provision and to their special focus on cultural tourism. Overall, 34 English (not necessarily the main or native language of the website) and 26 German cultural attractions as well as 41 English and 20 German destination websites, were evaluated. Details of the e-Services provided were collected, classified and evaluated on the basis of the e-Services they offer.

Attraction and destination websites show differences in their focus related to their different nature which is mainly reflected on a more extensive online heritage interpretation at cultural sites. Nevertheless, some of the destination websites already make direct use of heritage interpretation on their sites to enhance their offer, and are also using tools which include heritage interpretation aspects. A categorisation of the e-Services was developed and established that typical attraction websites include interactive maps, 3D applications, virtual tours, online exhibitions, interactive learning resources, games and fun tools, online collections and databases, user communication, community aspects, personalisation and online shops. Destination websites tend to focus on the provision of a gateway for making accommodation and events bookings, with e-Services on offer including personalised navigation,

interactive maps, travel journey planners, virtual tours, podcast files – offline and online tours – games and fun tools, user communication, and online shops. Interactive maps on attraction websites display the outline of the attraction – floor maps or wider areas – including location information about exhibitions, exhibits, further facilities, and sometimes the surrounding environment of the place – public transport, access points. These identified e-Services vary in their technological development, from some simple – interactive – structures to more complex interconnected e-Services, not only using different media, but also linking and displaying the different e-Services together. It shows that it is possible for organisations with limited technical resources to apply and interconnect e-Services integrating information provision and the delivery of a pleasant and innovative navigation experience for effective user engagement.

Interactive maps lend themselves to illustrate complex and layered information, making it more accessible for the user. They are commonly used as a starting and central navigation point, where different layers are interconnected, enabling the user to continue through virtual tours, fun activities, more factual and interpretative information, databases, and further multimedia tools such as sound and video files. Curating the city – Wilshire Blvd in Los Angeles (www.curatingthecity.org) uses an interactive map, displaying historic photographs, textual information and linking this to a memory book (user-generated content), collecting memories related to local history and (memorable) places. Symbolic and 3D presentation of these maps further enhances the virtual experience, e.g. the Alhambra, Spain connects the interactive 3D map to virtual tours and their stories (www.arsvirtual.com/visitas/visitas/Alhambra). Probably the best example identified for interactively combining e-Services through a central map, is the THEBAN Mapping project (www.thebanmappingproject.com). Its website shows the Valley of the Kings, and the Theban Necropolis. It allows users to explore the place interactively, allowing entrance to the tombs through a 3D virtual tour. This tour enables the user to pause the tour at any point, so that the user can click on items mentioned and pointed out by the storyteller, allowing the user to explore interpretive material in more detail (e.g. close-up images and expanded textual information). Whenever the user desires, the tour can be resumed. It provides further links to the archaeological developments on site. This example shows the potential cultural attraction websites have, overcoming accessibility restrictions for users not able to visit the place, and also enabling users to access as much information and explanation as they desire. Users can have these generic experiences on the website which support other heritage interpretation aims such as learning and entertainment.

More focused on learning are online exhibitions, collections and databases which are a core e-service provided by many museums. Top museums with large collections, such as the Rijksmuseum (www.rijksmuseum.nl/meesterwerken) and the Tate Gallery

(www.tate.org.uk/learning/schools), provide interconnected services such as virtual tours and searchable databases, including pictures and textual information. They also link from their exhibitions to further, more focused, fun tools. Information is not only connected via maps, but related to artists, themes, and also through a time line (www.musee-suisse.com). Many attractions and museums provide learning material for use offline and online. Offline material is most commonly targeted at educators for use within classrooms or linked to a museum visit. Online material either links to databases to support educators, or focuses more on making learning fun in targeting younger audiences, and those who still feel young. These outcomes can be achieved through sub websites especially designed for young people, or through games and fun tools. These vary from crossword puzzles and quizzes to game environments (www.kindermuseum.at). These game environments can also be linked to online exhibitions (www.thetech.org/nmot), or be introduced and connected to the places' mascot as in the case of Poldi (www.schoenbrunn.at/kinder) the castle's ghost. But not all learning activities are focused on the younger market. Despite online databases and collection access some examples provide adult learners with interactive learning tools (www.nationalarchives.gov.uk/gettingstarted/in_depth_guides.htm, www.musee-suisse.com).

Two examples on German destination websites were identified that make significant use of heritage interpretation, integrating stories and legends about the place by using a variety of interpretative media such as sound, videos, and pictures. Bremen (www.bremen-tourism.de/bremen.cfm?menu=Stadtmusikanten-Casting) presents the famous fairy tale from the Brothers Grimm related to its city, the "Bremer city musicians", portraying them in a casting situation for musicians' positions, and connecting this to different stories and factual information. The Stuttgarter Staeffele (staircases) (mw.hdm-stuttgart.de/staeffele) is a tool independent from the main website, telling stories related to each staircase, shows pictures and provides audio files where stories and facts are told. This is presented on an interactive abstract map, connecting the staircases. An increasing number of destinations are developing podcasts to be used either virtually or during the visit to the city (www.brusselsinternational.be). Dublin's iWalks are supported through map based printouts (www.visitdublin.com/multimedia/DublinPodcast.aspx?id=275).

4 Conclusions and Industry Implications

The results highlight the direct influence that heritage interpretive provision has on overall satisfaction in visitor experiences and the influence that this has on visitor perceptions of best experiences at museums that involve interaction and the use of the senses. This underlines that a key focus should continue to be on content but that enabling improved access and understanding through the use of interactive

interpretative media is valuable in cultural heritage tourism contexts. The stimulation of senses and emotions appropriate to the media employed is also likely to enhance online visitor satisfaction. In the virtual world, human senses are somewhat curtailed because of a dominance of the visual, though motioned images and sound can be used to emulate touch and smell.

Differences related to visitor profiles underline the need to cater for different target groups – e.g. residents/tourists, with/without children – and to choose interpretative media that suit the preferences of different age and target groups. Messages aimed at visitors with children, and interpretative media used in this context need to be fun, as well as supporting the learning aspect. It might be that the same content is delivered through different interpretative media to reach the different markets, making it more accessible. Many attraction websites already cater for different groups, enabling visitors to access similar information at different levels according to need. There is still much untapped creative potential to exploit the opportunities that technology provides for a range of virtual experiences, and heritage providers and operators should look more thoroughly at ways to engage consumers offsite as well as onsite.

Results related to perceived best experiences indicate that the practices of listening and/or watching, learning something new, actively doing something, and comparing the situation with something known and/or experienced before are important to satisfaction. All of these demonstrate that heritage interpretation is perhaps more human than many researchers and practitioners had imagined, and that people enjoy the processes of being engaged and moved and valuing these experiences above simple passivity. Similarly, stories, both personal and about the time and places represented by the museum, are important for a good experience indicating the desirability of making emotional and personal connections with visitors. This underlines the importance of interpretation in enabling visitors to experience material and immaterial cultural heritage, enabling them to connect with their own stories, to remember or to share. Online this experience could be emulated through the use of integrated e-Services, enabling people to listen, to watch and to experience stories as well as to share them online (verbally and through pictures), and could be encouraged by interaction with welcoming, appealing websites and e-Services. Additionally, the survey of existing e-Services found on tourism websites can be used to define suitable attributes for the emulation of satisfactory heritage interpretation designs - e.g. integrative navigation experience, the provision of interactive tools, virtual visits and the introduction of differential navigation paths for diverse target groups enabling customised visits. The current situation strongly suggests that the industry has the technical capability to implement e-Services in support of online heritage interpretation. This research project shows that this is something that should be further developed and more widely adopted, and furthermore can contribute by enabling systems of benchmarking to be established relating to contemporary best practice as well as providing a rationale.

E-Services for heritage interpretation can fulfil a double functionality for both cultural attractions and destination websites. Firstly, E-Services can enhance users' experiences of their virtual visit by helping them to engage in an interpretative and personalised navigation through the exhibit. Secondly, opportunities are also provided for operators to use such tools for the development of a unique and distinctive online experience and subsequent stronger brand image differentiation. Further studies should focus on the attributes of effective communication for online heritage interpretation, and on how providers can incorporate such technologies into their overall interpretative strategies.

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8 To improve the use of intangible (and tangible) cultural heritage assets in destination marketing

Mitsche, N., Vogt, F., Knox, D., Cooper, I., Lombardi, P., Ciaffi, D., (2013) 'Intangibles - enhancing access to cities' cultural heritage through interpretation', *International Journal of Culture, Tourism and Hospitality Research*, 7(1). 68-77. *Best paper award, also published in conference proceeding.*

8.1 Background & Innovation

This paper outlines a generalised process for an interpretative strategy for destinations aligned with their marketing and positioning strategies. The strategy is based on heritage interpretation strategies and utilises tangible and intangible heritage assets.

Following on from the previous research (Mitsche et al., 2008b; Mitsche and Bauernfeind, 2008) in chapter 7 the commodification process of cultural heritage for tourism consumption is part of destination marketing (Ashworth et al., 2007). The creation of unique images and imaginations in people's mind is enabled through positioning strategies, supporting the differentiation efforts of destinations in relation to their competitors (McCabe, 2008; Ritchie and Crouch, 2003). This is one of the main challenges destinations are facing in a more global environment (Mariani et al., 2014; Mariani and Baggio, 2012).

Traditionally, physical (tangible) built and natural heritage was utilised for those purposes (McCabe, 2008), but the use of a destination's intangible (immaterial) assets such as traditions and legends has further enhanced this process. Often referred to as *tangibilising the intangible* (Black, 2005) in the destinations context it is not necessarily only about merging the tangible and intangible, but also expanding on the meaning placed upon them and the representation created from them. This links to Prentice's (2006) argument that USPs can be proposed by destinations, but should be redefined by customers and the connection of USPs to tourist's lived experiences and

cultural familiarity with a destination. It further adds a personality to the destination (Sainaghi, 2006) with which its story telling strongly connects to the development of the destination and its place branding (Woodside, 2010; Woodside et al., 2008). This avoids for destinations to become substitutable look-alike and feel-alike places (Pike, 2009; Prentice, 2006). This creation of place brand and identity can add extra value, not only from a cultural and financial tourism perspective (Ashworth et al., 2007), but also from creating a sense of place and identity for tourists and residents alike (Gnoth, 2008).

The way in which the integration of tangible and intangible elements happens within a destination's positioning strategy, mirrors those steps used by museums to build their interpretative strategies for visitors (Mitsche et al., 2013). The story telling mirroring the way interpretation reveals meaning behind heritage (Tilden, 1957) and facilitating an experience which the visitor might not have encountered without it (Prentice and Cunnell, 1997).

Heritage interpretation is much about transmitting the importance and enthusiasm of a place (and artefacts) to visitors (Carter, 2001; Timothy and Boyd, 2006), "to make people more aware of the places they visit, to provide knowledge which increases their understanding and to promote interest which leads to greater enjoyment and perhaps responsibility" (Herbert, 1989, p. 191). Discovering hidden meanings and treasures which can attract new audiences, and sustain existing ones (Blockley, 2006), is part of this experience.

The perspective of visitors and their perception of a place is part of the destination image (Morgan, 2009), but in the context of cultural heritage there is also the perspective of existential authenticity where meanings are individual, and it is as much about the individual encounter of visitors as about the production of the image itself (Knox, 2008; Wang, 1999). As such, "effective interpretation must involve audiences in hearing and telling past stories, it emphasises human experience and places it at the core of those stories" (Blockley, 2006, p. 6). For destinations, this implies the inclusion of local communities, tourists and stakeholders, people who are using those

spaces, in their strategic developments (Bornhorst et al., 2010; Chase et al., 2012).

The research presented (Mitsche et al., 2013) contrasted in the first step the interpretative strategy used by attractions with the marketing approach by destinations and applied a destination perspective to the interpretation strategy. It focuses on the questions required to develop such a strategy and its processes, and was applied to the three ISAAC (ISAAC EU Project, 2008) cities of Amsterdam, Genoa and Leipzig. It included cultural heritage and destination stakeholders in the development process separately but also, uniquely, in a joined setting. The outcome of the workshop cycles developed an interpretation strategy for each of the cities, implementable as part of their positioning strategies. Heritage was looked at from its storytelling opportunities, and cities selected a greater variety of their heritage assets as potential for their strategies. As such, the process and implementation of interpretative strategies, applying heritage interpretation elements, demonstrates the objective of improving the use of intangible (and tangible) cultural heritage assets in destination marketing.

8.2 Methodology

The research is based on a bottom-up workshop approach of three consecutive workshops. The first workshop was held with cultural heritage providers and citizen (community) groups of the city and a second one with destination management staff. The focus of both workshops was to identify cultural heritage USPs and intangible stories within the cities which could be told to visitors. It focused on the stories to be told rather than on assets itself, although it enabled the link to cultural heritage places and artefacts. The results of the workshops were presented in the third workshop, held a few weeks later, which brought all participants together. The purpose of this workshop was to discuss the possible application for their city based on the results, utilising different interpretative media and technology. The workshops were held in English in Amsterdam, in Italian in Genoa and in German in Leipzig. To ensure compatibility, worksheets and presentations were

developed in English and translated to have a unified and comparable approach.

Limitations of this research are a spotlight of utilising unexplored cultural heritage in those already established destinations. As such, it provides an asset to the destination strategy, but not necessarily changing those strategies substantially. Due to project circumstances of previously involving visitors in other circumstances, this study did not include visitors or prospective visitors to incorporate their thoughts on the strategies developed or reflect on their own stories and experiences.

8.3 Findings & Contribution

The outcome of the three workshops was three individual interpretative strategies for the cities. It was important for the project itself, where city partners are often participatory, to receive a physical and applicable outcome additionally for them. This was well received and increased stakeholder satisfaction overall in the project, but also within the cities themselves, a lesson to be learnt for European projects in general.

Interestingly, and without any influence of the workshop moderators, all three interpretative strategies explored to tell relatively hidden stories of their cultural heritage assets, developing trails of hidden treasures and stories through their cities. The development process was city driven, with an urge of participants to tell their city's cultural heritage stories, promoting places and cultural attractions alike. Participants understood the commodification process, and utilised it to promote the city itself and expand on unexplored stories. The inclusion of different stakeholders and, in particular, citizen (heritage community) groups was valuable in the context of adding a new layer to the discussions (Bornhorst et al., 2010).

The innovative approach, integrating interpretation in a marketing context and commodifying cultural heritage, opens new layers in the destinations image (Mitsche et al., 2013), providing enhanced destination uniqueness and competitiveness (Morgan, 2009). It is also innovative in enabling greater

accessibility to intangible heritage assets of a destination by engaging, touching and reaching out to visitors.

As such the paper contributed to an expanded perspective of destination marketing in the context of intangible (and tangible) cultural heritage assets by

- developing an interpretative strategy utilising intangible heritage in the destination context aligned with the main marketing strategy of a destination
- improving the use and access to those (possibly underutilised) assets in the destination and its marketing
- highlighting the importance of integration of all stakeholders throughout the process, in particular citizen/heritage community groups and their direct collaboration throughout the process
- developing an innovative approach in developing new unique selling points for a destination by integrating place marketing elements and strengthening the relationship of visitors and residents with the destinations intangible cultural heritage

8.4 Summary and Response to Objectives

The main objective was to integrate intangible cultural heritage assets in the destinations marketing strategy. This was achieved by applying the heritage interpretative strategy in the destination context, integrating stakeholders in a joint effort to reflect on their destinations stories. The research outcomes show that this is a very useful approach in exploring new cultural heritage layers and stories of a destination, improving their competitiveness and uniqueness in not appearing to be a look-alike and feel-alike destination.

8.5 Paper

Intangibles: enhancing access to cities' cultural heritage through interpretation

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Abstract

Purpose – *The purpose of this paper is to utilise commodification for the conservation and promotion of cultural heritage in cities by developing interpretative strategies, specifically enabling access to intangible cultural heritage through its tangible parts.*

Design/methodology/approach – *In total, three case studies were conducted in the cities of Amsterdam, Genoa and Leipzig, through a workshop cycle with destination and local tourism stakeholders and citizen representatives, to develop interpretative strategies for the cities.*

Findings – *The paper identifies tangible and intangible cultural heritage of the three cities, and integrates them into stories and outlines the development of an interpretative strategy for destinations independent from, but aligned with, the current marketing and positioning strategy development level.*

Research limitations/implications – *Future research should examine the integration process of interpretative strategies and heritage interpretation of cultural heritage in marketing strategies, and in particular focus on the intangible aspects.*

Originality/value – *The article integrates and highlights the value of intangible cultural heritage and interpretation of cultural heritage in general for marketing purposes through the development of an interpretative strategy improving access to destinations' cultural heritage supporting destination management. The article adds to the research discussion of the commodification of cultural heritage.*

Keywords *The Netherlands, Italy, Germany, Cities, Heritage, Culture, Intangible cultural heritage, Heritage interpretation, Destination marketing, Commodification*

Paper type *Research paper*

1. Introduction

The importance of cultural heritage is recognised by many for tourism experiences, motivations and behaviour (Nyapaune *et al.*, 2006; Timothy and Boyd, 2003; Prentice and Duncan, 1994) and in a similar way for societal and community well-being, and sustainable urban development (Tweed and Sutherland, 2007). Destinations use this value of heritage by directly or indirectly commodifying heritage in their tourism marketing strategies (Ashworth *et al.*, 2007).

In particular for destination positioning, and brand and image building, cultural heritage is one of the factors that enable destinations to create unique images and imaginations in people's minds. Destinations have to work hard to keep a competitive advantage in the tourism market, differentiating and customising their products and services (McCabe, 2009; Ritchie and Crouch, 2000) in relation to their competitors. In this process, positioning relies on both the tangible (physical) and intangible (immaterial) elements of a destination's cultural heritage. Interpretation of cultural heritage is not only a gateway of understanding the cultural heritage itself, but also places the cultural heritage in the context of the destination and its people.

Developing an interpretative strategy through the evaluation of a destination's cultural heritage, exploring not only its physical representation but also its intangible elements by

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destination management, its cultural heritage stakeholders and citizen representatives, does not only enable destination to unlock its unique potential but also creates a sense of place that local communities can identify and relate to.

This paper presents research that has been conducted as part of the ISAAC project (European Union's 6th Framework Programme ISAAC IST-2006-035130; see www.isaac-project.eu). The project aims to promote cultural heritage tourism through a novel information communication technology (ICT) environment, providing integrated and user-friendly tourism e-services that facilitate wide virtual access to European cultural heritage assets. This paper focuses on the identification of cultural heritage, in particular its intangible aspects and stories worthwhile to be told, within a destination. It outlines the development of an interpretative strategy independent from, but aligned with, the current marketing and positioning strategy development level on the examples of three cities – i.e. Amsterdam (The Netherlands), Genoa (Italy) and Leipzig (Germany).

2. Destination positioning

Destination positioning presents a form of market communication, and used in tourism marketing it enables tourist destinations to enhance their attractiveness and competitiveness through the development of a unique distinctive position compared to their competitors (McCabe, 2009; World Trade Organization, 2006; Selby, 2004; Buhalis, 2000). This position is necessary to enable potential visitors to picture and visualise the destination in mind as a distinctive place.

Ideally this evokes images of a destination that is different from its competitors, which can be based on the differentiation of the offer, the prices, a specialised focus on offering, or a combination of them (Chacko, 1997; Kotler *et al.*, 2006) and also mirror the character and personality of the destination (Sainaghi, 2006). A successful positioning strategy has the further advantage of enabling the destination to increase its market share, face rising competition, enhance competitiveness or even gain a competitive edge (Buhalis, 2000; Go and Govers, 2000). For a positioning strategy to be effective Crompton *et al.* (1992) suggest that the destination attributes that are perceived as important by the target market should be identified first. Unique selling points (USPs) are components of a destination that are unique when compared to its competitors and provide it with an exceptional appeal in relation to market needs. Thus, they are crucial in order to differentiate a destination from its competitors. Kotler *et al.* (2006) suggest that USPs can consist of a single factor or a combination of several factors (e.g. best quality, best service, lowest price). However, Prentice (2006) argues that effective USPs are redefined by consumers but may be proposed by destinations. Thus, they should not be assumed, but instead their importance has to be identified and then represented back to consumers. Furthermore, Prentice (2006) enhanced USPs by the tourist's lived experiences and cultural familiarity with a destination.

Physical (tangible) qualities and attributes, and as part of this (built and natural) heritage, are main basis for most positioning strategies (McCabe, 2009). Cultural heritage is firstly thought of in its physical space, although cultural heritage extends beyond this. In a sense, not only the fact of the existence but also the particular use of the sites (can) make them heritage sites. Heritage can also be the experience in itself, which makes apparent how important memory, remembering and performance are (Smith, 2006).

The physical and material aspects of a destination, called tangibles, include fortified structures, urban developments, monuments and memorials, religious buildings including churches and especially monasteries, buildings associated with production or manufacture (farms, factories, etc.), government or civic buildings, villages, cultural landscapes, and manufactured objects in their context. The intangible (immaterial) qualities of a destination include such things as practices, representations, expressions, knowledge, skills, legends, language, tradition, religion, folklore, music and dance, handicrafts, etc. (Copeland and Delmaire, 2004; UNESCO, 1979). The challenge here is to make use of the intangible aspects. As the tourism product is made up largely of both elements, which are sometimes difficult to differentiate, destinations are marketing the intangibles with reference to tangible

evidence, which is referred to as “tangibilising the intangible” (Black, 2005, Chacko, 1997) – creating an amalgam of tangibles and intangibles. Destinations are not only about the tangible and intangible components of cultural heritage, but also the meaning placed upon them and the representations created from them. This adds either cultural or financial value, and explains why they have been selected (Ashworth *et al.*, 2007). Destination positioning is often expressed through branding and a tool for image creation. Marketing destinations through storytelling is likely to build favourable consumer-brand relationships (Woodside *et al.*, 2008). Developments in particular in place branding illustrate that the intangibles and storytelling are essential for destinations, and that adding value through meaning enables the creation of a sense of place and identity for residents and tourists alike. Auckland (New Zealand) is an example that highlights this necessity, where stories and what the city is all about are the main content to enable the creation of a place identity and brand (Gnoth, 2008).

3. Heritage interpretation

Heritage interpretation is about transmitting appreciation or enthusiasm for a place that is thought to be special to people (Carter, 2001), and is applied to explain the importance of a place to its visitors (Timothy and Boyd, 2003). According to Herbert (1989, p. 191), the role of interpretation is “to make people more aware of the places they visit, to provide knowledge which increases their understanding and to promote interest which leads to greater enjoyment and perhaps responsibility”. Interpretation is also a communication instrument to reveal the meaning behind the heritage and the given information by using objects, direct experience and instructive media (Tilden, 1957) or an activity used to present a message, or to facilitate an experience within attractions that visitors might not be able to experience without it (Prentice and Cunnell, 1997).

One dilemma that heritage interpretation faces is the tendency for people to believe what is presented to them in the name of authority – this is particularly true for messages emerging from public bodies (Hems, 2006). Interpretation has to be updated in response to new evidence and research in order to attempt to avoid such problems. Copeland (2006) alerts us to the need to remain aware of the distinctions between positivist and constructivist approaches to interpretation. Important in the context of interpretation is the recognition within constructivist approaches that meanings are always variable and individual, highly complex and contingent upon factors beyond either the message or the medium.

Similarly, accounts of existential models of authenticity tell us that authenticity effects are produced in the moment of the individual encounter and are as much about the consumer of an image as about the conditions and intentions of production (Knox, 2008; Wang, 1999). Copeland (2006) recognises that visitors bring ideas and assumptions to the site, and that these ready-made ideas need to become part of the interpretation, either challenging or confirming preconceived images (Hems, 2006). In this way, heritage venues only become special or unique places in relation to their broader context within cultural environments (Copeland, 2006). Additionally, through providing alternative ways of seeing the same object in different contexts, and enabling the visitor to unpeel the different layers of hidden meanings, new audiences can be attracted to cultural heritage sites and existing audiences sustained (Hems, 2006).

Interpretation plays an important role in experiencing places and combines both tangible and intangible aspects of the place. This experiential consumption enables destinations to brand and position themselves with unique selling points (USPs). To avoid becoming a substitutable or feel-alike destination, differentiation through USPs (Pike, 2009) can be used to enhance the lived experiences and cultural familiarity of a destination, as mentioned previously (Prentice, 2006). “Effective interpretation must involve audiences in hearing and telling past stories, it emphasises human experience and places it at the core of those stories” according to Hems (2006, p. 6). In particular, for destinations it means involving people who use the spaces – local people, communities, tourists and stakeholders.

4. What is an interpretative strategy?

In general, interpretative strategies are mainly developed by attractions. Those interpretative strategies outline interpretation and interpretative media used within the attraction for their different visitor target groups to pursue key themes (and specific messages within those themes).

This interpretation utilises facts and embeds them into stories, which should enable a better understanding of the selected themes, and on the simplest level this should provide a more effective communication (Carter, 2001). Some places have already used interpretation on a geographical level. An example of a heritage interpretation policy is provided by the Heritage Council of New South Wales, Australia (Heritage Council of New South Wales, 2005). They aim to connect communities with their heritage in order to protect and sustain heritage values through interpretation. In more detail, this interpretation policy not only seeks to promote interpretation, but also acknowledges associations and meanings of heritage to the community and integrates heritage interpretation in environmental and cultural planning in state and local government organisations. Another example is HERIAN (2006), which supported 26 industrial communities of South East Wales (UK) in local interpretation plans.

Interpretative strategies (sometimes synonymously called interpretation strategies) deal with the bigger picture and act as guidance and a framework to ensure needs are met compared to the more often commonly used interpretation plan, which specifies planned interpretation in more detail. The Scottish Museums Council (2003b) outlined the content of an interpretative strategy:

- aims and objectives;
- mechanisms;
- timescales and priorities; and
- budgets and management.

The aims and objectives are centred around the questions “What?”, “Why?” and “Who?”, and it is apparent that these can easily be linked to destinations’ positioning strategies and USPs. Table I contrasts and presents both perspectives, which were adapted from the literature (Black, 2005; Scottish Museums Council 2003a, b, c; Lord and Dexter, 2002; Carter, 2001) outlining a framework for aims and objectives of a destination-specific interpretative strategy.

Table I Interpretative strategy focus from attraction and destination perspective

<i>Attractions perspective</i>	<i>Destinations perspective</i>
What is special about a museum or site, and what is worthwhile interpreting from it: <ul style="list-style-type: none"> – thematic areas – meanings to reveal – stories to tell – what will interest visitors – what else is being interpreted nearby and how does it relate to this 	Positioning strategy USPs themes <ul style="list-style-type: none"> – stories to tell – what will interest visitors – intangible and tangible aspects of cultural heritage
Why the need for interpretation? (attraction perspective) <ul style="list-style-type: none"> – increase visitors’ understanding of exhibits – encourage conservation ethic – provide fun and rewarding days out for families – increase time people spent in museums, etc. 	Why? (city perspective) <ul style="list-style-type: none"> – increase understanding of cultural heritage – increase visitor numbers – regeneration, etc.
Who is the target? To attract new visitors? Improve provision for existing visitors? Need for more research about visitors?	Target markets Tourists (varied groups) Residents Community groups and groups of interests

A similar approach can be adopted for the other steps developing a destination perspective viewpoint. The mechanism focuses on how to achieve those aims and objectives, while budget and management also includes the possible factors affecting their implementation.

This implies for destinations that interpretation can be utilised to enhance their positioning strategy (e.g. by the use of elements such as stories). Interpretation enables destinations to generate varied and more distinctive unique selling points through experiencing of or familiarity with the destination. An interpretative strategy uses the tangible and intangible aspects of a destination to provide key themes about that destination's offer to visitors. Thus, an interpretative strategy enhances a destination's positioning strategy by adding distinctiveness and flagging uniqueness.

5. Method

This research uses commodification for the conservation and promotion of cultural heritage in cities by developing interpretative strategies, specifically enabling access to intangible cultural heritage through its tangible parts. In particular this research aims to outline a generalised process for producing an interpretative strategy (as presented in Table I), which can be taken up by the project's partner cities (Amsterdam, Genoa and Leipzig) and other cities independent from, but aligned with, their current marketing and positioning strategy development level.

This should enable them to develop their own interpretative strategies that can then be taken forward, filled with more specific content and integrated in existing strategies. It was essential in this process to inform the destinations involved about the aims, and their expected inputs to the development of such an interpretative strategy in advance of holding workshops with them involving both destination and attraction managers, and keeping them integrated and as part of the process throughout.

A workshop cycle integrating destination managers, local attraction stakeholders and citizen representatives informs the interpretative strategies for each of the cities. Overall, three on-site workshops were held in each city. The first two workshops were held on two consecutive days in September/October 2007. The same workshop was given to two different audiences in each city. The first focused on the destinations' management operating at the strategic and institutional level with participants from marketing, branding and regeneration departments and institutions. The second workshop included participants from the cities' wider stakeholder groups (attraction managers and other tourism related businesses) and citizen groups and organisations. This division was made under the assumption that their perspectives on their cities were different ensuring to capture the different views, but also bringing these groups together in a stepwise process.

The content of the workshop aimed to introduce all of these types of stakeholders to the interpretative strategy, to provide background knowledge on destination positioning, branding, unique selling points and heritage interpretation, as well as to identify already unique aspects of the cities' cultural heritage based on background material provided by the city partners. The format of the workshop included short briefings about these themes, with subsequent break-out sessions where participants explored the themes through feedback worksheets and moderated discussion. In these sessions, the participants captured tangible components of a destination's cultural heritage as key and smaller attractions and their attributes, explored possible stories and experiences within the city landscapes and attractions and reflected on them from the perspective of unique selling points already capturing intangible attributes.

The results of the workshops were summarised and distributed previous to the third and final workshop. The aim of the last workshop was to lead the three partner cities towards the development of an interpretative strategy for their own city as a cultural heritage tourist destination and to develop interpretative themes and key messages and then to evaluate how they could be applied for the city and further integrated in their own interpretative strategy. The workshop itself was structured to feed back and build on previous outcomes.

The workshop participants then chose stories with the greatest potential in terms of interpretation and communication for cultural heritage tourism, and analysed and evaluated them regarding potential for further development using SWOT analysis and reflection on its meaning. The workshops were held in English in Amsterdam, in German in Leipzig and in Italian in Genoa to overcome language barriers. All workshop and supporting material was first produced in English, and then translated and cross-checked by representatives in the partner cities.

6. Results

Amsterdam's tangible heritage dominates its identification of its main attractions. Museums were on the top of the list, followed by canals (either as an attractive feature or in terms of services provided on them), the red light district, but also naming the city's architecture and its historical buildings. The intangible features identified were the city's culture and the (unspecified) mentality of its inhabitants. Key attributes combine both the appreciation of Amsterdam's intangible cultural heritage – foremost its atmosphere, but also the freedom the city provides. The more tangible attributes mentioned were the village-like compactness, and offering new and fun experiences as the city is seen as being like an open-air museum offering direct experience of its cultural heritage.

Stories being told to tourists about Amsterdam are composed of a complex amalgam of tangible and intangible aspects of the city. Prime amongst these stories is the notion of the city as a continuous settlement, as living history where places can be visited where people lived 400 years ago and still live today. But, written into these physical places, there is also the cultural history of seagoing, trading, artistic and creative people. Commerce and creativity are manifested in the form of the city and its buildings. But just as important are the intangible strands – the notion of Amsterdam as a liberal, friendly and tolerant city. The most potent strand of experiences was seen as moving to a compact historical space, on both land and water. This contains both a guided “exploration and interpretation” and an “unguided exploration”. In this sense a theme of hidden treasures emerged.

In the third workshop both group of participants explored the variety of stories connecting different aspects. An attempt was made to identify unifying factors that could be used to cluster these stories for subsequent development. The two main stories explored were a “guided tour through a diverse and living history” and a “non-guided tour – build your own Golden Age, here and now”.

Discussions indicate strong support towards tours, and the routing mechanisms used to underpin these, as effective vehicles for integrating the diverse range of attractions and other elements of cultural heritage that the city has to offer. They also see tours as structuring devices that can both extend the range of attractions that tourists may visit and as a potent method of adding enhanced meaning – in the form of cultural heritage interpretation – to tourists' experiences whilst they follow the routes provided.

The workshops' findings for Genoa could play an interesting role in defining an appropriate strategy for Genoa's cultural tourism, contrasting the weaknesses and threats highlighted in the SWOT analysis. The main hidden treasure discovered through the workshop is actually the sea. The paradox is that cultural tourism linked to the aquatic theme is at the same time the main attraction of the city: both the Aquarium and the Galata museum of the sea work very well in this context. But participants stressed the necessity to re-discover the sea further, as both a resource for activities on it and as a departure point to visit the historical urban centre and its “Rolli palaces”, a UNESCO heritage with a unique cultural focal point. These were connected to the more immaterial elements of the city, such as its smells, classical and contemporary music, urban atmosphere and the particular pleasure of getting lost.

Overall, the sea and the “Rolli palaces” emerged as the two main stories, linking them not only in its physical space but also a re-thinking of traditional and quite hidden concepts of its particular features in relationship with the individual perception of the city. This non-guided form of tours emerged in a similar way as in Amsterdam, in contrast to guided tours.

However, participants stressed that the experience of those stories should not only relate to the past but also include what they called “young” Genoa, the capital of innovation. It is clearly anticipated that this aims to replace the image of the city as the capital of an “old” county where Genoa is visited mainly for its climatic conditions in winter. Connecting these past and present perceptions of the city, Genoa is noticeably an example that heritage is not frozen in time, but constantly reinvented and lived in.

The main focus of Leipzig, the third partner city, was to explore opportunities for their specific cultural heritage related to the “*Gründerzeit*”, as part of its urban regeneration using tourism as one means to commodify its physical conservation but also its new use, capturing the spirit of the past time but also the present, its conservation process. From the outset of the workshops a lack of definition of “*Gründerzeit*” emerged, suggesting that Leipzig has to establish a concept of “*Leipziger Gründerzeit*” as a buzzword by stressing its special connection with the city, the civic society and its cultural heritage. “*Leipziger Gründerzeit*” was described by the workshop participants as a locally specific form of rapid economic and social growth between approximately 1880 and 1918. The unique characteristics of Leipzig at this time in comparison to other German “*Gründerzeit*” cities was viewed from a historical perspective and relates to the Bourgeois City with its rich culture, its specific and contingent cultural heritage and association with books and book fairs.

From a modern day perspective, this still connects to the contemporary city of fairs as well as to the unique structure and form of preserved buildings, architecture and their assemblages of the different quarters. This uniqueness was highlighted as the main potential of “*Gründerzeit*” as a motivation to visit. Specifically, the architectural compactness and the range of different quarters reflecting both public and private elements of city life for a variety of different social classes were seen as being particularly interesting to potential visitors as well as the quality of the restoration of “*Gründerzeit*” buildings and quarters. The stories identified were restoration of the cultural heritage of the “*Leipziger Gründerzeit*”, technical achievements, and the Bourgeois City. It was felt they had the most potential for being delivered in an exciting and engaging way for visitors, meaning that very careful attention should be paid to both the content and medium of any interpretation as well as ensuring that a variety of stakeholders can take part in delivering the stories at particular sites.

Telling stories was particularly interesting – connecting between the past and the present to enable visitors to make emotional and personal connections to the everyday settings of both domestic and working life in the late nineteenth and early twentieth centuries. Moves could be made to ensure the integrity of a particular definition of “*Gründerzeit*” mobilised as part of an interpretative strategy, especially ensuring that the term is understood to refer variously to a period of time, a material landscape and a way of life. It will be important to maintain this unity of concepts in order to avoid confusing visitors and to ensure that educational objectives are met.

7. Conclusions

The bottom-up approach for the interpretative strategy enabled the cities to develop a different and deeper perspective on their cultural and heritage resources. By retaining an open mind, they reflected on their cultural assets, its novel combinations, and the aspects that can be valorised for tourism purposes, city life and culture and contribute to regeneration and conservation for the benefits of residents and tourists alike. The strategy development was city-driven, focusing on their own specifications of their particular needs to fill gaps and wants of stakeholders and city communities by providing understanding of and access to their particular cultural heritage and the places and stories connected to it. Participants of all workshops in all three cities had an urge to tell these stories, felt personally connected to them and therefore pushed developments further to make the story telling of their cultural heritage happen. The integration of citizen groups as representatives of the city’s communities, stakeholders and destination managers proved to be valuable and was the key to the success of the achievements of these working groups. Driven by the ISAAC project representatives of each city, the workshops enabled them to provide a platform to

enable this integration and communication between them, which continued beyond the workshops and will continue in the future.

The three workshops guiding the cities of Amsterdam, Leipzig, and Genoa to an outline of an interpretative strategy demonstrated that, independent from their previous tourism marketing experience, each city benefited from including interpretation in their marketing efforts. Each city started with a different focal point but over time they all focused on a specific theme where they put in all their interpretation effort, independently telling hidden treasure stories of their city.

The three examples of interpretative strategies demonstrate the usefulness of such strategies for destinations on a city or regional level, working to improve competitiveness through development of a stronger, more distinctive and unique positioning strategy. Discovering their own interpretation enables communities to discover and connect with their heritage and to protect and sustain their heritage value. Furthermore, the process to develop such interpretative strategies facilitates co-operation between destination management, the destination stakeholders and local residents. Common elements of such an interpretative strategy should centre – as an attraction-based interpretative strategy would – on both intangible and tangible unique selling points of the city, its associated stories and prospectively interesting themes for visitors. This analysis of the status quo of a destination is connected to the aims and objectives of the interpretative strategy, and with the broader strategic aims of the destination, as well as with current and prospective (new) target markets. Further elements within such a strategy need to reflect on mechanisms enabling these aims and objectives to be achieved, budget and management, and also possible factors affecting the implementation.

All three cities decided independently to tell the relatively hidden treasure of their city in the form of virtual guided walks, which can be used also on site. This means these stories were taken forward to be development within the ISAAC platform supporting both the pre-visit and the during-visit periods. Cultural heritage in a city context lends itself for trail-based interpretation. Developing such interpretation is also effective in integrating communities as a means of how they want to present themselves (Goodey, 2006).

If tourism is a lifelong and career-like pursuit, individuals tend to collect sights/sites of varying degrees of uniqueness and standardisation during their life course. Leipzig and Genoa need to grasp opportunities to present themselves as both uniquely and inherently interesting cities and as one of many European cultural heritage tourist-historic cities that are integrated into more complex itineraries. Operationalising an interpretative strategy that builds upon the stories that emerge from the workshops in each of these cities is one of the ways of implementing this strategy.

Ascertaining how best to interpret and re-tell such stories in order to engage, touch and reach out to visitors before, during and after their visits is important. The intangibles of the cities' cultural heritage need to be communicated to potential visitors alongside the tangible elements of cultural heritage – these intangible feelings, emotions and spirits will enliven the material heritage.

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9 Innovation and contribution to knowledge

The overarching research question of this thesis is **'How can Information and Communication Technologies be used to support a destination in improving tourists' information search and decision making through the use of its digital and cultural assets?'** This was explored through 5 objectives, achieved through the 8 publications presented. The first section outlines the key innovations and contributions to knowledge in relation to the 5 objectives and overall objective. The impacts on research, destination and the researcher are then considered.

9.1 Overall contribution to knowledge

The main contributions presented within the research papers are firmly based within the field of eTourism towards the areas of recommendation systems, the online information search process, and web site evaluation and efficiency. Research in the context of recommendation systems continues to be particularly relevant in relation to mobile technologies, where the debate of personality types continues and gamification seeks for more opportunities (Egger and Bulencea, 2015; Neidhardt et al., 2014). The research in relation to online search behaviour explored the understanding of tourists' online behaviour, which is still how we search today (Pan, 2015) highlighting the simplicity of search. The results are transferable and relevant in the mobile and social media context, where more research is still required. Conclusions and recommendations from the studies evaluating web sites and technology use within destination and cultural heritage settings have contributed to the overall framework of web site evaluation work within tourism, and such recommendations and methodologies are continuing to be relevant for the overall online provision (web site, social media platforms and mobile applications) (Gasparetti, 2016). Combined with the knowledge gained from understanding the online search behaviour and recommendation systems, these results highlight the continuous need for updating, consistency and

simplicity as well as making the time users spend within this online realm an experience.

In destination marketing, the research contributes to the debates of personality research in tourism and the use of technologies for destination marketing (Kim et al., 2015; Uysal et al., 2016; Yoo and Gretzel, 2011). It provides examples for the usefulness of technology and (tangible and intangible) cultural heritage (assets) to be part of the tourism experience. It also highlights the opportunities which both ICT and heritage assets can provide to improve a destination's USP.

In heritage tourism, the research highlights the opportunities of technologies to improve accessibility. It contributes to the debate of using technologies for heritage interpretation in the tourism context (Botha et al., 2016; Chhabra, 2010; Hall et al., 2015; Kavoura, 2014; Smykova, 2015). It also contributes to the debate of commodification of local heritage for destination marketing purposes and highlights opportunities within this debate, rather than warning of its dangers.

Overall the research is interconnected between eTourism, destination marketing and heritage tourism, and as such it contributes to its emerging triangle of research which is placed under the wider umbrella of ICT, destinations and heritage.

9.2 5 objectives: Innovations and Contribution to Knowledge

1. To evaluate the potential for targeted online destination marketing through travel recommendation systems (Gretzel et al., 2004; Mitsche, 2002, 2001)

The papers meet the objective as they highlight the usefulness, effectiveness and entertainment quality of travel recommendation for the travel decision making and, as such, are one way to enhance online destination marketing.

The innovations are in their uniqueness, applying self-categorisation using travel personality categories, which provide better than by chance recommendations for users and confirming that travel personalities and

travel motivations and activities are connected. The study (Gretzel et al., 2004) was commended for its innovative approach at won the Best Paper Award at the International Conference for Tourism and Information and Communication Technologies (ENTER) in 2004 in Cairo. The work has been cited in the context of travel recommendations and in the context of travel recommendation systems and travel personality research throughout (Jani, 2014; Neidhardt et al., 2014).

Innovations of the other two papers (Mitsche, 2002, 2001) were the conceptual development and architecture for tourism focused travel planning systems, connecting travel recommendation systems more strongly to the tourism search and decision process. The work did fit into the early framework of the DieToRecs EU project (Intelligent Recommendation for Tourist Destination Decision Making, IST-2000-29474) (DIETORECS, 2004), with occurring some citations.

2. To investigate different search patterns, strategies and keywords within the online search process in the destination context (Mitsche, 2005)

The paper meets the objective by providing detailed insights into the behaviour of users in the search process on destination web sites, enabling destination management organisations to draw conclusions to improve their search engine optimisation strategies and their homepage.

The innovation of this research is based on a unique analysis of search queries from a number of destination management organisations, all over the same period of time. The results provide a unique understanding of prospective tourists search behaviour, in their short simplistic search queries and patterns, and the skewness of main keywords used. The research has been cited, and has initiated further research in understanding the search through a destination specific search engine. Indeed, the results have been confirmed recently using data from a global search engine (Pan, 2015; Xiang and Pan, 2011). The paper was recognised, for its innovative approach and interesting results, with the Best Paper Award at the International Conference for Tourism and

Information and Communication Technologies (ENTER) in 2005. It is cited in the tourism information search context (Ho et al., 2012).

3. To assess Web site efficiency of destination organisations (Bauernfeind and Mitsche, 2008)

The research objective of this paper is answered by highlighting not only the importance but also the usefulness of a quantitative benchmarking approach for destination management organisations. It provides them with quantifiable recommendations regarding their performance, and identifies benchmarking partners to learn from, and exchange knowledge and experiences. The study has been cited within the context of web site evaluation methods in tourism and more specifically within data envelopment approaches (DEA) in tourism. The study has been used as a baseline for recent research which re-evaluated the efficiency of tourism destination web sites (Alzua-Sorzabal et al., 2015).

4. To investigate the digitisation status and use of e-Services in delivering heritage interpretation to improve interpretation and marketing (Mitsche et al., 2007; Mitsche and Bauernfeind, 2008)

The papers meet the research objective by providing a framework to evaluate the digitisation status of a specific web sites group including specific criteria such as heritage interpretation and insights in the opportunities of technology for heritage interpretation and marketing. In conjunction with interviews and observations, this is an innovative way to provide useful information for cities to reflect on their use of technology within this area. In this case it provided a reflection for the ISAAC cities of Amsterdam, Genoa and Leipzig and informed the user requirements for the final ISAAC prototype. It was also used to inform the research instrument for the development of the interpretative strategies for the ISAAC cities (Mitsche et al., 2013), and the evaluation of the final ISAAC prototype (Mitsche et al., 2009). Both papers have occurred citations in the heritage and technology context (Mele et al., 2015).

5. To improve the use of intangible (and tangible) cultural heritage assets in destination marketing (Mitsche et al., 2013)

The research objective is met by providing an innovative and interdisciplinary instrument to destination marketing, enabling the use of

untold stories and intangible local heritage for commodification purposes and improving its accessibility to local residents and tourists alike. Further innovation of this study was the inclusive and collaborative approach of destination management stakeholders, cultural heritage attraction stakeholders, and local citizen/heritage community groups working together as a unit to explore opportunities of untold stories. The innovative work has been recognised with a Best Paper Award at the International Conference on Intangible Heritage and has been cited in the context of intangible heritage in destinations (Apostolakis et al., 2015; Hall et al., 2015).

9.3 Research, Applied and Researcher Contribution and Impact

This section provides an overview of the research and applied impacts by the researcher, focusing on the research presented, and a short reflection on the researcher's journey.

9.3.1 Research impacts

Research impacts were made in the areas of eTourism, destination marketing and heritage tourism through publications and their citations. The Google index shows overall 250 citations (24/10/2016), 207 are from the researchers work in tourism and 164 relate to the research presented. Work has been cited internationally and nationally. The researcher is also present on research gate which highlights currently 1049 reads (24/10/2016) of the publications on their system.

Three of the papers also received Best Paper Awards at international conferences. Gretzel et al, (2004) and Mitsche (2005) received Best Paper Awards at the International Conference of Information and Communication Technologies in Tourism (ENTER) in Cairo (Egypt) and Innsbruck (Austria) . Mitsche et al. (2013) was awarded Best Paper Award at the Sharing Cultures: International Conference on Intangible Heritage in Portugal. An invited keynote was also given on a national conference of the Tourism Society in Aviemore (Scotland).

The researcher has also made further impacts also through completed internal (2) and external (1) co-supervision of PhD students and is currently co-supervising one PhD.

9.3.2 Applied impacts

Applied impacts were made through the studies connected to the ISAAC project in the actual development of the final prototype. Research conducted in collaboration with destinations impacted those destinations immediately after the completion of the ISAAC project and beyond. Within this context the development of the interpretative strategies also impacted on the destinations and their perspective and inclusion of different unexplored heritage assets. The cities have, within the short time frame, applied the results within the prototype and developed bespoke solutions for their representations beyond the ISAAC project.

Amsterdam has moved to a stronger integration of 'off the beaten track' attractions and continues this approach to improve footfall within their city and support the change of their destination image. Leipzig has recognised the value of their unique Gründerzeit heritage within their city as a valuable contributor to its heritage and tourism and continues to do so. Genoa continued to promote their inner city area around the Strada Nova through innovative use of technologies online.

The impacts of the research was evaluated and summarised for the REF 2014 as a case study: "Integrated e-Services for Advanced Access to Heritage in Cultural Tourist Destinations (ISAAC)" (Obrador and Mitsche, 2014). The feedback was collected through contact with the cities and the project coordinator in written statements.

9.3.3 Researcher Impacts

The interdisciplinary and joint publication nature of many of the papers presented meant working with people, cooperating, exploring and discussing ideas often beyond the boundaries of the research presented. This collaboration helped me to expand my own background, enabled me to explore and learn from research in other areas, and develop my research. It

enabled me to explore methodologies outside of my original comfort zone, and opened up a wider view on the world of research philosophies and methodologies.

The journey of revisiting the research through this commentary was a useful one. Not only has it made me reflect on the research itself, but is also influencing new research projects and, indeed, my future research journey which lies ahead.

It made clear that joint research is a fruitful and fun process. People from all walks of life and disciplines can influence the research undertaken and provide inspiration for academic debates and innovation. There has been a clear influence on my research by my co-authors, but also the research environment. It will be a path I will continue to pursue.

Dissecting every research output in detail provided the opportunity to re-evaluate the research in the current context. The process enabled me to put these pieces back together, creating an overall picture of my research. The themes of my research have emerged more coherent via this process compared to the beginning of the journey.

Investigating the relationship between the papers highlighted a lack of self-citations. Although, previous research clearly influenced the research, this link needs to be expressed more clearly, overcoming feelings of discomfort and the pursuit of justification through other research rather than my own.

The philosophical reflective journey was interlinked with the influences of interdisciplinarity. There is a realisation, as a researcher aligning myself with one of the paradigms is temporary alignment rather than a permanent one. In consequence, it continues to be a journey rather than a belief in one of the paradigms.

In conclusion, I question myself if the journey would have been different, if it was planned as a PhD in a traditional context rather than retrospectively. In many ways I wonder if those opportunities of collaborations would have been

pursued in the same way and if I would have become the same researcher I am today.

9.4 Summary

This chapter summarised innovations and contribution to knowledge for each of the five research objectives. Key innovations can be summarised as

- Usefulness, effectiveness and entertainment quality of travel recommendation for travel decision making to enhance online destination marketing
- Application of self-categorisation using travel personality
- Insights of user behaviour in the search process and their search queries on and in relation to destination web sites to draw conclusions for DMOs
- Importance and usefulness of quantitative benchmarking approaches for DMOs
- Framework to evaluate digitisation status of different web sites groups including heritage interpretation criteria
- Use of intangible heritage assets and untold stories for commodification purposes in destination marketing utilising heritage interpretation methods
- Inclusive and collaborative approach of destination management stakeholders, cultural heritage attraction stakeholders and local citizen/heritage community groups to develop opportunities for destination marketing purposes supporting local interests.

My contribution to knowledge is in the areas of eTourism, specifically in recommendation systems, online search process and evaluation of online presence. This is interconnected to areas of destination marketing where knowledge is contributed towards the areas of the experience economy in destination marketing and providing examples for the usefulness of ICT and cultural heritage for destinations USPs. In heritage tourism, my contribution adds to the debate of the application of technologies for heritage

interpretation and the commodification of (local) cultural heritage assets for destination marketing and tourism purposes.

Impacts through publications and citations were made in the areas of eTourism, destination marketing and heritage tourism. The Google scholar index has recorded 250 citations (24/10/2016) towards the work presented here, and the academic social network 'ResearchGate' currently has registered overall 1049 reads of publications (24/10/2016) of the researcher on their system (October 2016). Further research impacts were made through Best Paper Awards, invited keynote and supervision of PhD students.

Applied impacts were made in the cities of Amsterdam, Genoa and Leipzig through outcomes of the studies. The cities applied and recognised the results of the studies and continued to expand footfall through the promotion of "off the beaten track" attractions utilising technology on the way. The positive impacts of joint research and the inspiration provided with working with researchers and practitioners from a multitude of disciplines has shaped the researcher, who will continue to work with people internationally keeping an open mind in the context of disciplines and research methods.

10 Conclusions

This research explored the main research question **how information and communication technologies can be used to support a destination in improving tourists' information search and decision making through the use of its digital and cultural assets**. It does this through a collection of eight research papers which support the main research question through answering five specific objectives such as

- 1. To evaluate the potential for targeted online destination marketing through travel recommendation systems**
- 2. To investigate different search patterns, strategies and keywords within the online search process in the destination context**
- 3. To assess Web site efficiency of destination organisations**
- 4. To investigate the digitisation status and use of e-Services in delivering heritage interpretation to improve interpretation and marketing**
- 5. To improve the use of intangible (and tangible) cultural heritage assets in destination marketing**

The objectives are answered by developing frameworks to assess different aspects of destination management web sites and support destinations in improving the provision itself and their visibility within global search engines. It explored the opportunities of technologies and heritage interpretation for destinations, and provided recommendations on how to utilise them within their destination marketing strategies, while also supporting cultural heritage through improving conservation efforts and accessibility.

In reflection the research is also a journey through time of developments within the context of the research objective. Limitations of developing a competitive system and opportunities of integration into existing systems and utilising existing applications were recognised to improve users' experience on destination web sites. Through engaging in the interdisciplinary discourse, suggestions to improve destinations competitiveness within the more global market have been created supported by the emergence of new technologies.

Destination marketing has learnt to utilise technologies, and the research mirrors a variation of innovative approaches to do so, either through fun and useful travel recommendation, the integration of travel personalities in destination marketing research, or the integration of heritage interpretation strategies to explore intangible (and tangible) cultural heritage assets for destination marketing for each others' benefit.

The main contribution of this work is new and enhanced insights on how to improve on-line destination presentation by understanding its current representation and users' search and behaviour patterns online and during travelling. It provides examples for the usefulness of ICT and cultural heritage to improve destinations' marketing efforts. It also adds to the debate of the application of technologies for heritage interpretation and the commodification of (local) cultural heritage assets for destination marketing and tourism purposes.

My current and future research journey is already, and will continue to be, influenced by the self-reflective nature of this thesis. Current and continued research will emphasise the application of technologies for tourism destinations (Reino et al., 2014), with an emphasis on cultural heritage (Strielkowski and Mitsche, accepted by reviewers, currently being amended).

There are plans to adopt findings and frameworks in the social media and mobile technologies context. First steps into this new field have already been taken, investigating the search process and communication strategies of destination visitors in the context of one trip. The data from this research is currently being analysed and prepared for publication as part of a case study which investigates the use of mobile technologies in teaching (Mitsche and Mulindwa, n.d.).

Current research has also commenced in evaluating a concept of tourism desire, which is based on tourism imaginaries interlinked with frameworks of tourism information search and tourism motivation. Further research will be looking on re-applying a similar approach of search pattern analysis in the context of a social media form and investigating the use and usefulness of fun elements such as games in the social media context.

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12 Appendix: Collaboration statements

The collaboration statements are sorted by authors in alphabetic order.

STATEMENT OF AUTHORSHIP OF PUBLICATION

On behalf of *Nicole Mitsche*

By *Ulrike Bauernfeind*

I am registering for a PhD by Existing Published or Creative works. A condition of the registration is that I have a statement from collaborating authors confirming the contribution made by myself to jointly authored work. In our case the work is:

Bauernfeind, U., Mitsche, N. (2008). The Application of the Data Envelopment Analysis for Tourism Website Evaluation. Journal of Information Technology and Tourism Vol. 10 (3) pp. 15-258

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Mitsche, N., Reino, S., Knox, D., Bauernfeind, U. (2008). Enhancing cultural tourism e-services through heritage interpretation. In: O'Connor, P., Höpken, W., Gretzel, U. (eds.): Information and Communication Technologies in Tourism (ENTER 2008), Proceedings of the International Conference in Innsbruck, Austria, 418-429, Springer, Vienna-New York.

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By *Daniela Ciaffi*

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By *Daniel Fesenmaier*

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By *Dan Knox*

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Mitsche, N., Reino, S., Knox, D., Bauernfeind, U. (2008). Enhancing cultural tourism e-services through heritage interpretation. In: O'Connor, P., Höpken, W., Gretzel, U. (eds.); Information and Communication Technologies in Tourism (ENTER 2008), Proceedings of the International Conference in Innsbruck, Austria, 418-429, Springer, Vienna-New York,

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Mitsche, N., Vogt, F., Knox, D., Cooper, I., Lombardi, P., Ciaffi, D., (2013). Intangibles - enhancing access to cities' cultural heritage through interpretation. *International Journal of Culture, Tourism and Hospitality Research*; Vol. 7 (1), pp. 68-77

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On behalf of *Nicole Mitsche*

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By *Franziska Vogt*

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Mitsche, N., Vogt, F., Knox, D., Cooper, I., Lombardi, P., Ciaffi, D., (2013). Intangibles - enhancing access to cities' cultural heritage through interpretation. *International Journal of Culture, Tourism and Hospitality Research*; Vol. 7 (1), pp. 68-77

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