Roland Schegg · Brigitte Stangl
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Information and Communication Technologies in Tourism 2017

Proceedings of the International Conference in Rome, Italy, January 24–26, 2017

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Springer

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Preface

Organized by the International Federation for IT and Travel & Tourism (IFITT), ENTER2017 eTourism Conference takes place in Rome, Italy, on January 24–26, 2017. The 24th annual international conference features the latest research and industry case studies on the application of information and communication technologies (ICT) to travel and tourism. The conference theme, 'eTourism: Sustaining Culture and Creativity' was an invitation to discuss the transformation and opportunities in travel and tourism due to the latest development in digital technologies.

The research track of ENTER2017 received a total of 129 submissions covering a diverse variety of fields within the area of ICT and tourism. Each research paper submission went through a rigorous double-blind review process with members of ENTER2017 Scientific Committee assigned as reviewers. Where issues remained, additional reviews were commissioned. As a result, 56 full research papers were accepted for presentation at the conference and are included in the proceedings.

While still maintaining a broad topic of ICT applications in travel and tourism, the papers presented in this volume advance the state-of-the-art research on digital marketing and social media, mobile computing and Web design, semantic technologies and recommender systems, augmented and virtual reality, electronic distribution and online travel reviews, MOOC and eLearning, eGovernment, and sharing economy. The papers featured in the proceedings bring new perspectives to the field and give a promising evidence that the field of ICT and tourism will continue to contribute to our society. We hope the proceedings will serve as a valuable source of information on the state-of-the-art in ICT and tourism research.

We greatly appreciate the considerable time put in by all members of ENTER2017 Scientific Committee who helped us ensure that the content of the research papers was of high quality. We are indebted to the panel of experts who helped us with additional reviews to select candidates for the best paper award.

We are also thankful to ENTER2017 Overall Chair, Oriol Miralbell, IFITT President, Lorenzo Cantoni, other ENTER2017 organizers, IFITT Board, and all members of IFITT for their support and for accommodating the many inquiries we have made while managing the research track.

Importantly, we thank all authors for their willingness to disseminate their latest research at ENTER2017. This conference would not be possible without their efforts.

Sierre, Switzerland — Roland Schegg
Guildford, UK — Brigitte Stangl

The original version of the book was revised: For detailed information please see Erratum. The Erratum to this book is available at DOI 10.1007/978-3-319-51168-9_57

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Part I
Recommender Systems and Semantic Web

Ontology-Based Matchmaking to Provide Personalized Recommendations for Tourists

Christoph Grün, Julia Neidhardt and Hannes Werthner

Abstract This paper addresses the challenges to support tourists in their decision-making during the pre-trip phase and to facilitate the process of identifying those tourism objects that best fit the tourists' preferences. The latter directly depends on the quality of the matchmaking process, i.e. finding those tourism objects that are most attractive to a particular tourist. To achieve this goal, an innovative approach is introduced that matches tourist profiles with the characteristics of tourism objects in order to obtain a ranked list of appropriate objects for a particular tourist. The matchmaking process leverages tourist factors as a shortcut to propose a first user profile and related to this, a first set of tourism objects. User feedback is then used to dynamically adapt the tourist profile and thus refine the set of recommended objects. Our approach is tested through a prototypical recommender system that suggests tourists in Vienna attractions that are tailored to their personal needs. Furthermore, a user study is conducted by asking people to interact with the system and fill in a questionnaire afterwards.

Keywords Recommender systems · Tourist typologies · Ontologies · Matchmaking · User modelling

1 Introduction

The tourism industry leverages Internet technologies to sell travel services to its customers via online channels. On the other hand, tourists use the Web to search for travel-related information or to book their trips online. This way, both stakeholders

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(suppliers and consumers) benefit from the Web for information research and as (additional) selling channel. The provision and consumption of online travel services have become for both a "daily" business.

Although such services help to access reliable information as well as to undertake reservations in a fraction of time, cost and inconvenience required by conventional methods (O´Connor, 1999), the huge amount and variety of information available on the Web entails high cognitive costs and might lead to daunting information overload. To counteract the risk of information overload, intelligent systems are needed that assist users in searching for relevant information (Werthner et al., 2015). Much research has been conducted in this area, targeting information search behaviour, travel destination choice models (Fesenmaier, Werthner, & Wöber, 2006) as well as recommender systems (Borràs, Moreno, & Valls, 2014). Thereby, the gap between the mental model of tourists and the model of the tourism space (i.e., the destination) is a crucial issue (Xiang, Gretzel, & Fesenmaier, 2008). Tourists might not be satisfied with the proposed objects and might get frustrated when they cannot find the objects they are looking for. Obviously, this has a negative impact on their planning experience.

In this paper a method is introduced that matches tourist profiles with the characteristics of tourism objects in order to obtain a ranked list of appropriate objects for a particular tourist. This matchmaking process is able to generate personalized recommendations by (a) modelling and integrating the customers' and suppliers' perspective, (b) leveraging the concept of tourist types, (c) exploiting ontologies, and (d) integrating tourist feedback to revise the current recommendation of tourism objects.

The rest of the paper is organized as follows. In Sect. 2 the state-of-the-art is presented, comprising recommender systems that utilize Semantic Web technologies as well existing tourist typologies. In Sect. 3 our matchmaking process is introduced. Section 4 presents its implementation in form of a prototype, including the data sources used to describe the tourism objects, the user interface and functionality as well as the system architecture and technologies. Section 5 presents a first evaluation of the matchmaking process, which has been carried out in form of a user study. Final remarks and conclusions are provided in Sect. 6.

2 Related Work

2.1 Semantic Web-Based Tourism Applications

An overview of semantics-aware content-based recommender systems is given by de Gemmis, Lops, Musto, Narducci, and Semeraro (2015). Al-Hassan, Lu, and Lu (2015) present a semantic-enhanced hybrid recommendation approach that combines a standard item-based CF approach with a semantic measure that utilizes the Australian tourism service ontology in order to create an item-item semantic

similarity matrix of tourism service items. In our approach, a tourism ontology is used to classify tourism objects. The profiles of both, the users and the tourism objects, are formed as overlay of this ontology. The ontological network is used to propagate user interest scores for certain tourism objects to related concepts in the ontology and thus refine the corresponding user profile. SigTur is a Web-based system that provides personalized recommendations of touristic activities in a region of Spain based on semantic similarity measures and collaborative filtering techniques (Moreno, Valls, Isern, Marin, & Borràs, 2013). Related to our approach, certain parts of the user profile are represented with a tourism ontology and updated based on the activities the user performs. A Web form is used to initialize the user profile. Our approach leverages the concept of tourist types (see Sect. 2.2) in order to model the user generic interests in an abstract form.

2.2 Tourist Types

Much research has been conducted that aims to understand travel-decision-processes and the motivations why people travel. Plog (2001) develops a *psychocentric/allocentric model* of personality types in order to study the relationship between travel personalities and destination selection. Pearce and Lee (2005) present the *Travel Career Pattern model*, in which they investigate 13 travel motivation patterns and how they are influenced by different levels of travel experience and age of travellers.

Extending their previous work on how people like to enact in destinations, Gibson and Yiannakis (2002) present *17 different tourist roles* (e.g., Drifter, Escapist or Seeker) to distinguish tourist stereotypes according to their generic interests and attitudes. These tourist roles form—together with the "Big Five" personality traits (i.e. extraversion, agreeableness, conscientiousness, neuroticism, and openness)—the basis for the personality-based recommender system introduced by Neidhardt, Seyfang, Schuster, and Werthner (2014). Its aim is to combine short-term behaviour (captured by the 17 tourist roles) with long-term preferences (captured by the "Big Five") when determining a user's profile. With the help of factor analysis, the tourist roles and the "Big Five" could be reduced to a set of seven factors (i.e. sun loving and connected, educational, independent, culture loving, open minded and sportive, risk seeking and silence loving) that constitute the user model. The preferences of a user, moreover, are elicited with the help of pictures.

Gretzel, Mitsche, Hwang, and Fesenmaier (2004) highlight that tourist types (e.g., Sight Seeker) are a valid means to predict touristic activities during vacations. Tourist types can serve as a shortcut to propose appropriate tourism objects based on predetermined preferences related to the corresponding tourist types.

3 Matchmaking

In order to provide personalized trip recommendations for tourists, an iterative matchmaking process (cf. Fig. 1) is introduced that matches tourist profiles with the profiles of tourism objects in order to propose personalized recommendations (i.e., a list of appropriate tourism objects) for a particular tourist. The process consists of two sub-processes (cf. Fig. 1, no. 1a and 2a), which are described in the following.

3.1 First Matchmaking Process

For the first matchmaking process (cf. Fig. 1, no. 1a), a stereotype approach is devised to model tourists' generic preferences and to establish a basic profile. Tourists are typically not able to exactly specify all their interests during trip-planning but rather describe their predispositions through statements such as "I am more interested in culture than in history". In order to model such statements, the concept of tourist types is leveraged. Thus, to obtain a first generic user profile, the users are asked to choose among a set of predefined travel factors (Neidhardt et al., 2014), which are presented to them through a Web interface (cf. Fig. 2). Users can use the rating bars to quantify how much they identify themselves with each of the tourist factors.

A vector-space model is used to characterize this setting, whereby each dimension of that space corresponds to one tourist factor. Making use of the information how much a particular tourist identifies him- or herself with each of the factors, a score for this tourist can be assigned to each dimension and thus the user profile can be represented in the vector-space straightforwardly. This idea is illustrated in Fig. 3 with the help of an exemplary tourist, who likes to enact in the

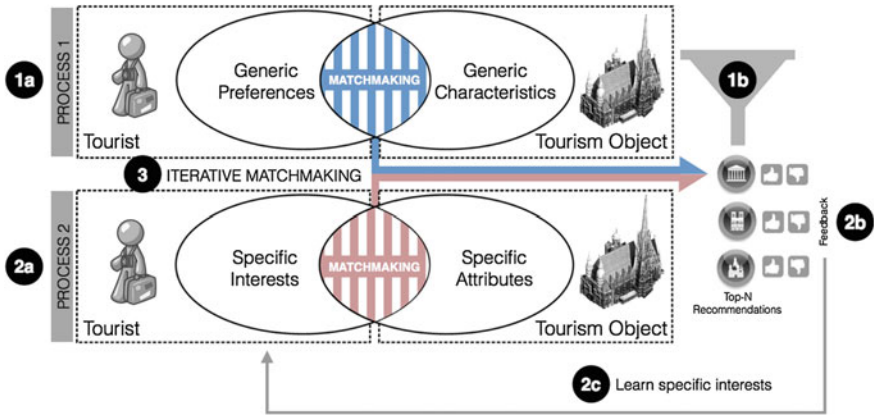

Fig. 1 Overview of the matchmaking process

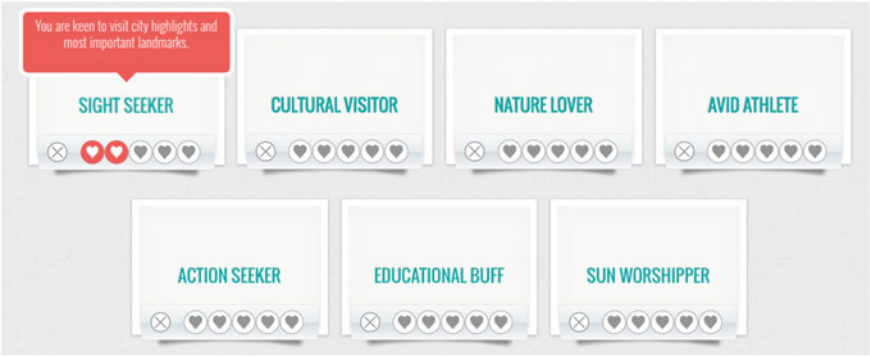

Fig. 2 Web interface, where users choose tourist factors to initialize their profile

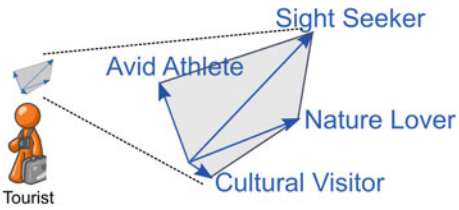

Fig. 3 Modelling the tourist profile through a vector

role of a Sight Seeker, followed by Nature Lover and Avid Athlete, and rather dislikes cultural activities. Typically, tourists cannot be characterized by only one archetype but have mixed profiles comprising attributes of several types, although to varying degrees (Gretzel et al., 2004). Thus, tourist factors model the tourists' generic interests in an abstract form.

Now, given that the tourism objects are represented in the same space, vector-based matchmaking can be applied to relate user profile vectors against vectors of tourism objects (cf. Fig. 4). In our case, the tourism objects have been linked to the tourist factors (e.g., the Cultural Visitor) in a semi-automatic way. In a first step, domain experts mark manually for each of the prototypical tourist factors

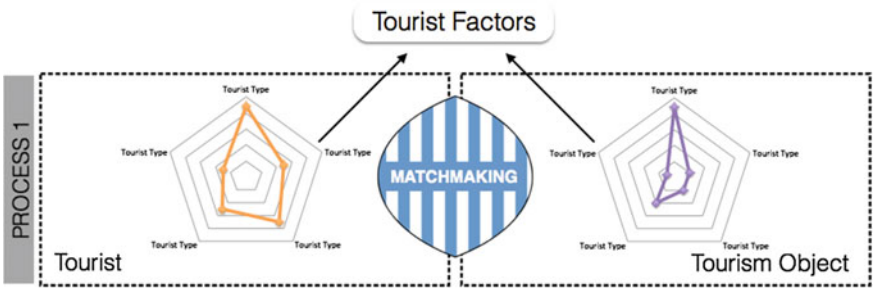

Fig. 4 Representing generic profiles in a vector-space model

(e.g., Action Seeker or Cultural Visitor) a small sample of typical tourism objects that are closely related to these types. The degree of relationship can be specified with different weightings. That is done individually for each of the tourist types. In a second step, the ratings of the domain experts can be propagated to other tourism objects that are similar to the ones rated by the domain expert. As the tourism objects are semantically annotated according to a tourism ontology (see Sect. 3.2), semantic similarity measures can be used to calculate the similarity between the objects and propagate the ratings throughout the semantic network of tourism objects.

For the matchmaking, the Euclidean metric is used. It calculates the distance between a given tourist vector and the vectors of the tourism objects. The smaller this distance the more similar are the vectors. Now, a top-N list of tourism objects can be recommended to a tourist, by showing him or her the N closest, i.e. most similar, tourism objects with respect to his or her profile (cf. Fig. 1, no. 1b). This constitutes the first matchmaking process.

3.2 Second Matchmaking Process

The focus of the second matchmaking process (cf. Fig. 1, no. 2a) is to refine the generic tourist profile and to enrich the generic preferences of a tourist through more specific interests (e.g., a tourist may be a Sight Seeker but may dislike churches). This is achieved by exploiting user feedback on the proposed top-N list of objects (cf. Fig. 1, no. 2b) and by using this information to derive a more fine-granular profile that is capable to model statements such as 'dislike of churches' (cf. Fig. 1, no. 2c).

In contrast to the tourist factors utilized in the first recommendation process, an ontology-based approach is favoured to model the specific profiles of a tourist as well as the tourism objects. In order to generate these specific profiles, the main ideas of the spreading activation algorithm proposed by Sieg, Mobasher, and Burke (2007) are applied. In our case, a specific profile is represented as an overlay of an ontological domain model describing the tourism objects. The domain model is based on the modularized ontology presented by Barta, Feilmayr, Pröll, Grün, and Werthner (2009).

In the following, it is explained how the specific profiles of the tourist and tourism objects are generated and how the underlying ontological model is exploited to enable *score inferences* between concepts within the ontology.

Users have the possibility to either give positive or negative feedback on the top-N recommended tourism objects (cf. Fig. 1, no. 2b). As soon as an object receives a rating, the set of concepts within the ontology is identified that semantically describe the corresponding object. For example, if the user gives a positive feedback on the museum "Imperial Furniture Collection" located in Vienna he or she might also prefer objects that are classified under the same category i.e., *cultural history museum*. Hence, a certain amount of interest score can be assigned to

the leaf concepts with which the "Imperial Furniture Collection" is annotated, namely *cultural history museum* and *imperial Vienna*. The ontological hierarchy can be further exploited to infer an interest score for those concepts that are super-concepts of these concepts, e.g., its parent concept *museum* (see Ziegler, Lausen, & Schmidt-Thieme, 2004). In this way, different kinds of relations within the ontological model can be exploited to predict the interests in unexplored concepts, i.e. concepts that are not yet rated by the user (Brusilovsky & Millán, 2007). Hence, the ontological model facilitates the propagation of user interests between child and parent concepts or any other related concepts. Without such a semantic network, predicting the interest scores of other concepts would be impossible; e.g., if a user expresses interest in an object connected with the concept *art gallery*, the interest level of this concept would be increased but not the level of the concept *museum* as it is unknown how these concepts are related.

The user profile is thus formed by the interest scores assigned to the concepts of the ontology. It can be modelled as a high-dimensional vector whereby the dimensions represent the concepts and the values represent the interest value (cf. Fig. 5). Not only the user interests, but also the characteristics of the tourism objects can be represented as overlays of the domain model. First, the set of leaf concepts that directly describe a tourism object is identified. In a next step, a certain amount of score is assigned to them, which is then propagated to related concepts in the ontological hierarchy. However, in contrast to the score allocation process in case of a user profile, the score that is assigned to the leaf concepts is set to a maximum score max_S. Here, max_S is the highest score that can be achieved in the user overlay model if the user rates this concept (implicitly) a vast number of times.

Hence, the tourism objects can be modelled in the same vector space. The ontological concepts represent the dimensions while the values indicate how much the tourism objects correspond to the different concepts. In order to examine whether the tourism objects match a particular user profile, their high-dimensional vectors can be related against the high-dimensional vector of the tourist. In order to measure the similarity between the user profile and the profiles of the various tourism object profiles we use Pearson correlation. Pearson correlation allows to

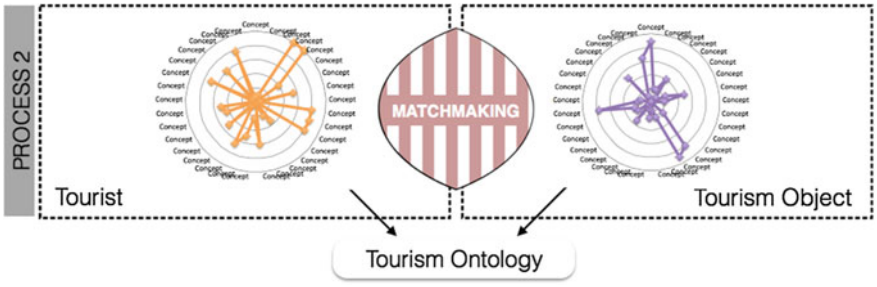

Fig. 5 The specific profiles can be represented as high-dimensional vectors

discover negative correlation and implicitly normalizes the values of the vectors to their arithmetic mean. This constitutes the second matchmaking process.

3.3 Combination of the Matchmaking Processes

The first and second matchmaking processes are combined and executed iteratively (cf. Fig. 1, no. 3), thus resulting in consecutive recommendation cycles. At the beginning, tourists state their generic preferences and obtain a first top-N list of recommendations. As long as they are not satisfied with the recommendations, they can criticize the proposed tourism objects by stating positive/negative feedback, which will be used to refine their profile and to deliver a new set of top-N objects.

The combination of the two matchmaking processes is done with the help of a weighting factor α that controls the influence of the two processes on the resulting similarity value between a tourist and a certain tourism object. At the beginning, the weighting factor α is set to the initial value 0 as no user feedback is available. This means that the first recommendation of top-N objects is solely generated by using the first matchmaking process based on the tourist factors (cf. Fig. 1, no. 1a). As soon as feedback from the user on the proposed objects is obtained, α increases and the second matchmaking process based on interest propagation can be incorporated in the overall recommendation process. A new list of top-N objects can be recommended based on both processes. The factor α increases following a linear function, the more tourism objects are rated.

4 Implementation

The matchmaking approach has been implemented in form of a three-tier Java Web application, containing a front-end, business and data layer. The system architecture is displayed in Fig. 6.

For the front-end, Apache Wicket is used which is a component-based Web framework to ease the creation of Web sites. The business layer contains all the logic needed to fetch data from the database, load data from external data sources and provide services to the front-end to facilitate the interaction with the user. In detail, it comprises different modules for profile generation, matchmaking and interest propagation of positive and negative ratings to semantically related concepts within the ontology. Hibernate is used as an Object Relational-Mapping (ORM) framework to handle the mapping between the object model and the relational database. Overall, the Spring framework is used to define the object dependencies and allow the injection of dependencies in Java objects. At the database layer, a PostgreSQL relational database is used to store the profiles and

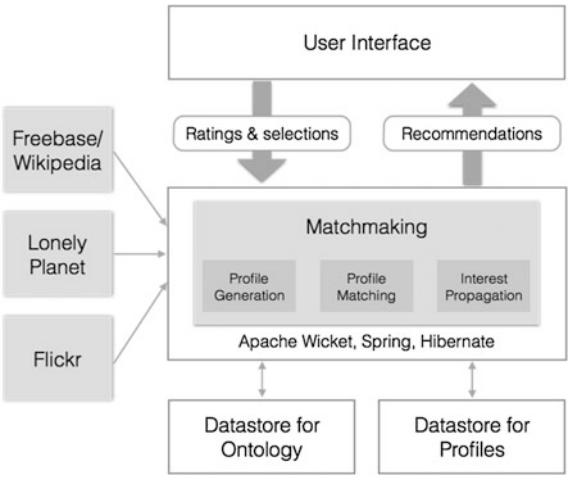

Fig. 6 System architecture

relevant attributes of the tourism objects. The ontology with the tourism-related concepts and the tourism objects as instances is stored in a Jena TDB triple store.

A total of 138 tourism objects of Vienna has been inserted in the tourism database and indexed under semantic concepts of the tourism ontology. Relevant information concerning these objects is exploited and integrated from several external data sources, including Freebase (descriptions of tourism objects), Lonely Planet (phone number, website, ticket price, transportation, opening-hours and a review of tourism objects) and Flickr (additional pictures of tourism objects).

The application provides a landing page (cf. Fig. 2) that facilitates users to describe their predispositions/generic preferences through seven tourist factors (i.e. Sight Seeker, Cultural Visitor, Nature Lover, Avid Athlete, Action Seeker, Educational Buff and Sun Worshipper). When the user is ready to proceed, he or she has to confirm the selection. This triggers the calculation of his or her generic profile based on the seven factor selection. This profile is then matched with the generic profiles of the tourism objects in order to produce a first ranked list of tourism objects.

The following page (cf. Fig. 7) depicts on the left side the ten top ranked tourism objects that best fit the user profile (cf. no. 1). Each object is characterized with a picture, a title, some keywords and a short description. On the right side by default a map is shown that depicts the top 10 recommended objects (cf. no. 2). The small heart icon next to each tourism object provides the user the possibility to select it as one of his or her favourites (cf. no. 3). By clicking it the respective object is added to the favourites list (indicated through its picture) at the bottom of the page and inserted at the next free position (cf. no. 4). When the user clicks on the title or description of a tourism object (cf. no. 5), relevant details of this object are shown on the right side of the page instead of the map. This includes contact information, website, ticket price, transportation or opening-hours. In addition, a description and

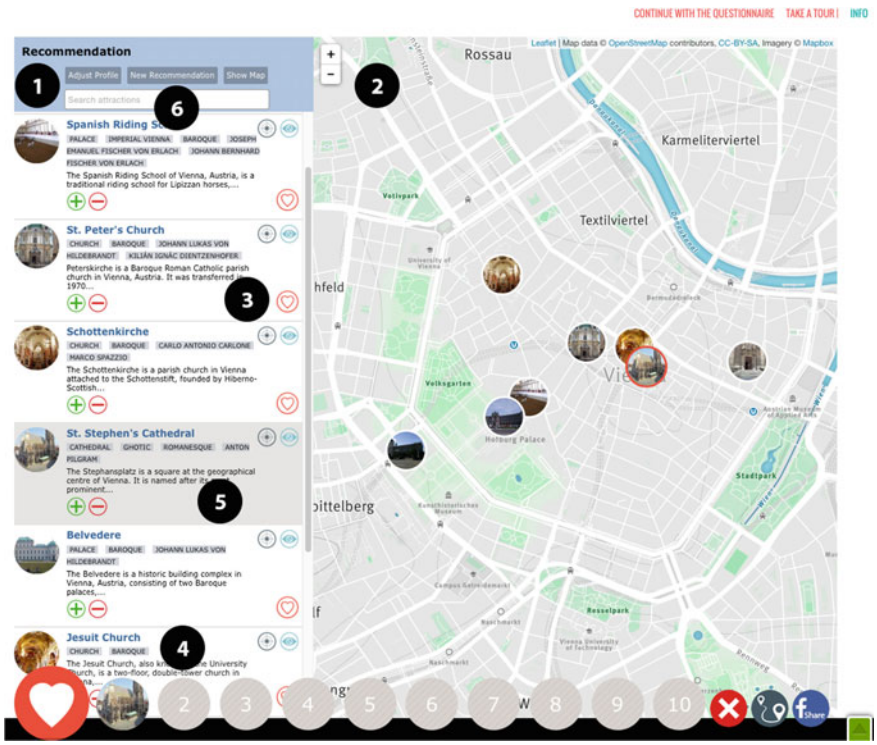

Fig. 7 User interface with top-N list of recommendations, which are shown on a map

a Lonely Planet review are shown. The button "New Recommendation" triggers a new recommendation cycle (cf. no. 6). This means that a new ranked list of tourism objects is generated by matching the (updated) user profile with the profiles of all tourism objects.

5 Evaluation

In this section, a first evaluation is presented, which aims to investigate the feasibility of the approach. Thus, the focus is on the user experience including the interactions of the users with the system and their overall satisfaction with the provided recommendations. The evaluation is based on a dataset extracted from weblog information of the recommender system, which had been available on the Web over a period of three months from June to September 2015. The target group consisted of tourists who had already visited Vienna or who plan to visit Vienna in the near future as well as persons who know Vienna, e.g. locals. In order to find suitable participants, postings had been placed on the homepage of the institute as

well as in various Facebook groups (e.g., Foreigners in Vienna). Furthermore, colleagues had been asked to distribute an invitation for participation via their personal social networks.

In total, 232 distinct user sessions were identified. In 137 sessions users interacted with the system by adding at least one recommended tourism object to their list of favourite items. The questionnaire was completed by 54 users. These 54 user sessions were used as the final dataset, comprising 26 female and 28 male users.

First, the selection patterns of the seven tourist factors were analysed in order to explore with how many factors the users typically identify themselves. 57% of the users (i.e. 32 users) selected a mixture of all seven factors and about 75% (i.e. 41 users) chose at least 5 factors. This confirms that users tend to select more than one tourist factor if they have the choice (Gretzel et al., 2004). On average, the users selected 5.7 factors to describe their predisposition and generic preferences. Furthermore, a number of high and moderately high correlations between the factors could be identified: the factor Sight Seeker to Cultural Visitor ($\rho = 0.43^{**}$, where ** refers to $p < 0.01$), to Avid Athlete ($\rho = 0.42^{**}$), to Action Seeker ($\rho = 0.53^{***}$, where *** refers to $p < 0.001$) and to Nature Lover ($\rho = 0.49^{***}$); the factor Cultural Visitor to Action Seeker ($\rho = 0.33^{*}$, where * refers to $p < 0.05$); the factor Nature Lover to Sun Worshipper ($\rho = 0.56^{***}$), to Educational Buff ($\rho = 0.39^{**}$), to Sight Seeker ($\rho = 0.49^{***}$), to Avid Athlete ($\rho = 0.67^{***}$) and to Action Seeker ($\rho = 0.45^{***}$). Regarding the extent of identification, the users mostly identified themselves with the factors Sight Seeker (mean 65.2 out of 100), Nature Lover (mean 56.7) and Cultural Visitor (mean 57.4) whereas the other factors were less important. A reason might be that Vienna is a city destination and therefore not so much associated with activities related to sports, action or sun bathing.

Next, the number of recommendation cycles that had been produced by the users was investigated, i.e. how often a user requested to get a new set of recommended items from the system based on his or her feedback. In Fig. 8 the distribution of the recommendation cycles is depicted. About 70% of the users explored the recommendations proposed by the system within one to six recommendation cycles. The arithmetic mean is 5.5. Users who exhibit a higher identification with the factor

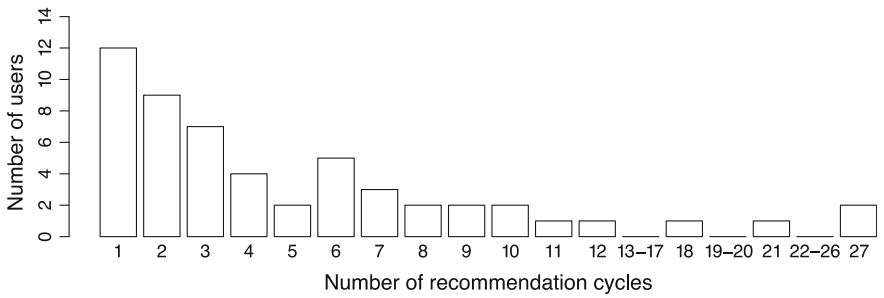

Fig. 8 Distribution of recommendation cycles

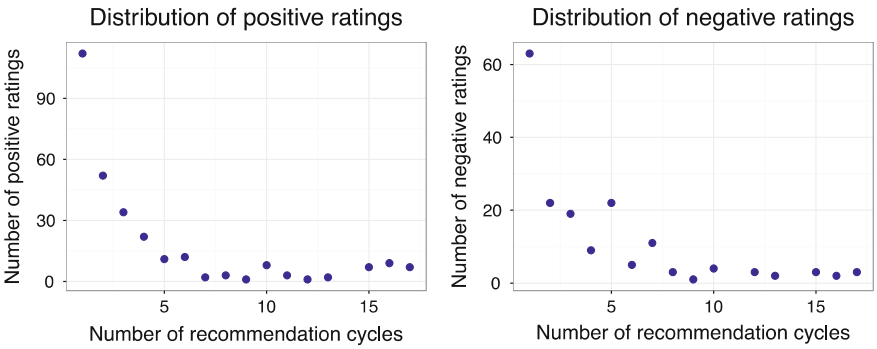

Fig. 9 Distribution of positive and negative ratings

Cultural Visitor tend to have a lower number of recommendation cycles ($\rho = -0.28^{*}$).

Figure 9 shows the distribution of the positive and negative ratings over the recommendation cycles. On average, 8.48 ratings had been given in each user session, whereby about 40% of the ratings were stated in the first recommendation cycle. In total, the 54 sessions produced 286 positive ratings (i.e. 5.3 ratings per user on average) and 172 negative ratings (i.e. 3.2 ratings per user on average). Obviously, these aspects are related, i.e., the number of positive ratings is moderately high correlated to the number of recommendation cycles ($\rho = 0.27^{*}$) and highly correlated to the number of negative ratings ($\rho = 0.75^{***}$).

Next, the participants were asked to rate on a 4-point Likert scale how much they were satisfied with the application. On average, their degree of satisfaction reaches a value of 2.94 points (with a maximum of 4 points) so it seems that they are overall satisfied using this application. However, female participants are significantly more satisfied than males (3.15 vs. 2.75 points, $p < 0.05$). The interface received on average 3.03 points and the rating of the recommendation feature scored 3.00 points. Furthermore, the participants had to indicate whether they prefer to get a diversified set of attractions at the beginning in order to explore alternatives (e.g. the set of recommended attractions should not only contain attractions of a specific type such as museums). On average, the participants rated this question with a score of 3.26 points. This might be an indication that the users like to get a diversified set of recommendations at the beginning of the recommendation session when no further specific preferences are known to the system. The follow-up question "When repeatedly declaring interest in attractions of a specific type (e.g. churches) I prefer getting more attractions of this kind at the price of less variance of the proposed attractions." was rated on average with 2.94 points. This question is closely linked to the former one—when the user expresses interest in specific objects it seems that he or she prefers to get results tailored to his or her specific preferences in favour of a rather diversified result set.

6 Conclusions

The overall goal of this paper was to close the gap between users' needs and suppliers' perspectives by matching their respective views. This issue was addressed by developing a matchmaking process and applying this process in the e-tourism domain. A Web-based prototype was implemented that proposes tourists, who would like to visit Vienna, a set of suitable tourism objects. A first evaluation was conducted, where participants were asked to explore the prototype within a user study. To evaluate the performance of the recommendation algorithm, A/B tests are planned. In future work, pictures will be used to determine the initial profile of the users in order to elicit prevailing travel preferences implicitly (Neidhardt et al., 2014). Furthermore, user profiles will be stored and refined for recurring visitors. It will be considered, moreover, how contextual factors such as the distance between objects could be used to improve the recommendations. Another important aspect is the development of automated and scalable procedures to annotate the tourism objects semantically. Currently approaches are tested that build upon existing knowledge bases or use text mining techniques.

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A Chat-Based Group Recommender System for Tourism

Thuy Ngoc Nguyen and Francesco Ricci

Abstract Group recommender systems aim at supporting a group of users in making decisions when considering a set of alternatives. State of the art solutions aggregate individual preferences acquired before the actual decision making process and suggest items that fit the aggregated model. In this paper, we illustrate a different approach, which is implemented in a system that records and uses the users' preferences expressed while the group discusses options. The system monitors users' interactions and offers appropriate directions and recommendations. The system runs on a smartphone and acts as a facilitator to guide and help the group members in coming up with an agreement and a final decision. In order to measure the effectiveness of the proposed technologies we have focussed on usability and perceived recommendation quality. In a controlled live user study, we have measured a high usability score, good user-perceived recommendation quality and choice satisfaction.

Keywords Group recommender systems · Group decision support · Travel recommender systems

1 Introduction

Recommender systems (RSs) are information search tools that alleviate information overload by straightforwardly suggesting items that are likely to suit users' needs and preferences (Ricci, Rokach, & Shapira, 2015). In many situations, the recommended items are consumed by groups of users (Jameson & Smyth, 2007). For instance, users may seek a restaurant for a group of friends or a vacation package for

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a whole family to experience together. These types of scenarios have led to the emerging field of Group Recommender Systems (GRSs).

Recommending items to a group has been regarded as complicated because of the existence of conflicting preferences between group members. To address this challenge, a large number of research studies on GRSs have focused on preference aggregation strategies, i.e., methods for merging individual preferences and identifying the "best" items for a group. According to Arrow's theorem, however, there is no single optimal method to aggregate individual preferences (voting system), hence many voting approaches have been proposed. Moreover, group members often change their mind, i.e., their preferences, while interacting with each other and with the system (Masthoff, 2015). A few studies in GRSs therefore have tried to model and use the interactions between users and system in order to support group members to reach a consensus. One technique that clearly exemplifies this direction is *critiquing* (McGinty & Reilly, 2011), which is implemented in naturalistic negotiations where users are enabled to respond to proposed items by providing feature-specific feedback. For example, the user's response "show me one like this, but cheaper" would be a directional critique on the "price" of the recommended item.

Actually, social scientists studying group dynamics have stressed the importance of various aspects and steps, of the full decision process adopted by a group, in determining the quality of the output decision (Forsyth, 2014). However, in the context of GRSs still little attention has been devoted to understand how the *process* of making choices in groups can be supported (Chen et al., 2013). In this context we note that a recent observational study on group decision processes has confirmed that group preferences are constructed *during* the process and further stressed that the research in GRSs needs to put more emphasis on the decision making process taking place in groups rather than on solving group recommendation problems in a mechanical way and focusing only on the preference aggregation (voting) step (Delic et al., 2016).

Motivated by these findings, in this paper, we introduce the interaction design of a mobile tourism application that supports a group decision making process. Places of interest items are typically experienced in groups and for selecting them we propose a new GRS that generates recommendations based on the ephemeral (group-dependent) preferences which are derived from the observation of users' interactions when they are in a group. More concretely, we make the following contributions:

- We have implemented a mobile GRS for the tourism domain. The system allows group members to take part in a group discussion, and supports various tasks that the members are likely to undertake during the decision process, such as, asking for information, making comparisons, or seeking a rationale for options.
- We introduce a model that, unlike previous approaches, which merely relies on individual long-term preferences, exploits the group-induced preferences that arise when users are members of the group by monitoring their actions during the group interaction. For that goal, we have designed a novel ranking and group recommendation techniques.

- We have conducted a user study to demonstrate the benefits of the proposed group recommender system and the empirical results show that it is usable and our model is able to enhance the perceived group recommendation quality and the group choice satisfaction.

The rest of the paper is structured as follows. Section 2 gives an overview of the related work. Section 3 introduces the proposed human-system interaction. The proposed model of providing group recommendations and ranking items is then presented in Sect. 4. Then, we describe the experimental evaluation in Sect. 5 and detail the obtained results in Sect. 6. Finally, in Sect. 7 we formulate our conclusions alongside the identified future work.

2 Related Work

Group recommendation techniques fall into two general approaches: aggregate profiles and aggregate recommendations. The former merges existing item ratings of group members to create a single group profile to which conventional recommendation techniques can be applied. The latter generates individual recommendation lists for each member and then combines those lists to form a single one for the group (Jameson & Smyth, 2007). However, it is still not clear which approach should be preferred. The choice depends on the domain, the data and the precise task. For instance, in a food recommendation scenario, Berkovsky and Freyne (2010) compare these two strategies, and show that the former marginally outperforms the latter. More in general, how to optimally aggregate (either preferences or recommendations) is a well-researched topic. Masthoff (2015) gives an overview of different aggregation strategies for reaching group decisions such as *Average*, *Least Misery* or *Most Pleasure*. In Baltrunas, Makcinskas, and Ricci (2010), the authors took a further step by investigating the performance of different rank aggregation strategies for generating group recommendations from individual recommendations by using simulated data of user groups. Recently, a group decision support environment *Choicla* has been developed. It allows the flexible definition of decision functionality in a domain-independent setting (Stettinger, Felfernig, Leitner, Reiterer, & Jeran, 2015). *Choicla* implements basic aggregation heuristics mentioned above as well as Multi Attribute Utility Theory (MAUT) that helps to rank the items in the result sets.

The research in travel recommender systems for groups has made several contributions. Specifically, *Intrigue* (Ardissono, Goy, Petrone, Segnan, & Torasso, 2003) is a tool helping tour guides in designing tours for heterogeneous tourist groups such as families with children and elderly, which include relatively homogeneous subgroups (e.g. children). The group model, which aggregates user preferences, is a weighted average of the subgroup models, which are weighted according to the importance of the subgroups. Moving into the direction of supporting users-to-users and users-to-system interactions, *Travel Decision Forum*

allows users to interact with embodied conversational agents representing group members to reach an accepted group preference (Jameson, 2004). In *Collaborative Advisory Travel System,* critiquing is used for allowing each group member to send a "critique" to the other members, thereby sharing thoughts about a specific option (McCarthy, McGinty, Smyth, & Salamó, 2006). In line with this research direction, Guzzi, Ricci, and Burke (2011) introduced interactive multi-party critiquing, an extension of the critiquing concept to a computer-mediated conversation between two group members, and the authors implemented it in a mobile phone application for group recommendation of restaurants called *Where2eat.*

However, as we notice, in traditional critique-based techniques, users are expected to explicitly point out the critiqued features, i.e., identifying the features that they like or dislike. This requires considerable user efforts and is especially hard for those who are not able to clearly differentiate the importance of such features. In contrast, our proposed technique derives preferences solely from user evaluations for items and then infers which item features are important to users by comparing the item the user liked and disliked. Thus, in this paper, we propose an approach that constructs the user and group profiles by observing a series of user interactions during the group discussion. Our system supports a real-time recommendation functionality based on the user-system interactions, so that the group has the possibility to interact and explore different alternatives that can be seen as compromises for the group.

3 Application Scenario

The rationale of the interaction design of the proposed system comes from studies on the functional theory of group decision making which suggest that groups, when facing decision tasks, are actually engaged in a four stages process: *Orientation–Discussion–Decision–Implementation* (Forsyth, 2014). Furthermore, decision makers often seek and construct reasons in order to resolve the conflicts and justify their choices when they are faced with the need to choose (Shafir, Simonson, & Tversky, 1993). In the scope of this paper, we primarily concentrate on the discussion stage which is regarded as the most vital part of the decision making process. According to Forsyth (2014), it is the information processing hub on which users typically rely to arrive at the final decision. More concretely, we address the issue of how to support the group discussion by providing a chat environment that is believed to be convenient and comfortable for group members to express their thoughts and to interact with each other as well as with the system. From the system perspective, through chat logs composed of exchanged messages and actions, the interactions between users can be tracked, and used for inferring information about the changing users' preferences.

For these reasons, we have designed and implemented a GRS with a chat-based interface called STSGroup (South Tyrol Suggests for Group). STSGroup is an Android-based mobile application that extends to groups STS

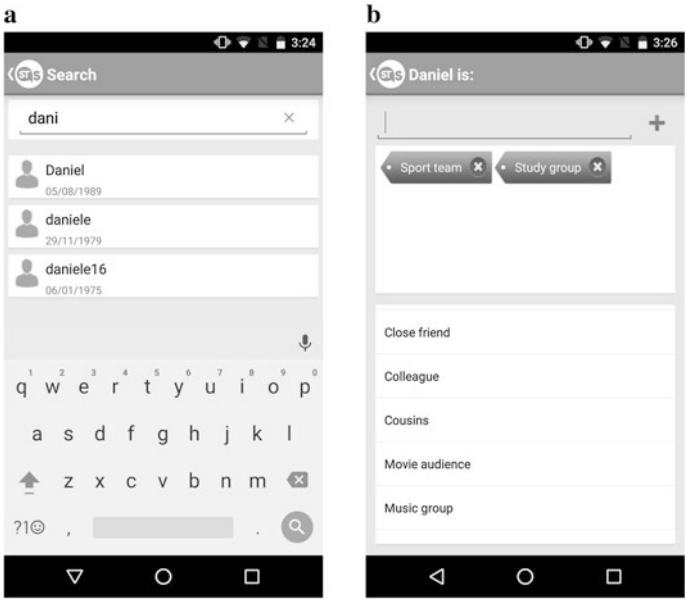

Fig. 1 **a** Search companions and **b** tag companions

(Braunhofer, Elahi, & Ricci, 2014), a context-aware places of interest (POIs) recommender devoted to individuals. In the following, we will describe a typical interaction with our system.

Let us assume a tourist or a citizen is looking for a POI (in South Tyrol, Italy) for her group to visit together. After the registration to the system, the user can specify her companions through appropriate system screens including: searching companions by user name (see Fig. 1a), sending connection requests and tagging companions (see Fig. 1b). Once a group of people that are connected by the "companion" relation wants to visit a POI, the discussion/chat is ready to start. Note that users can always access functions that are already available in STS; for instance, they can specify context variables such as their mood, or browse their personalized recommendations which are computed by taking into account only their personal preferences (ratings for previously experienced POIs). As soon as a group is connected, one member can send messages to the other group members and a discussion session is started (see Fig. 2a). The users can exchange messages in a chat application (similar e.g. to WhatsApp). Any user can autonomously search in STSGroup for interesting POIs and propose them to their group companions. All proposed POIs are displayed chronologically in the group discussion space, together with other messages. Group members can react to a proposed POI with a: like (thumb up), dislike (thumb down), or best (crown icon). User can also tag proposed POIs with comments and emoticons (Fig. 2b). A summary comparison panel aggregating and comparing the members' likes, dislikes and best is always shown on the top of the screen in order to keep users aware of the other members'

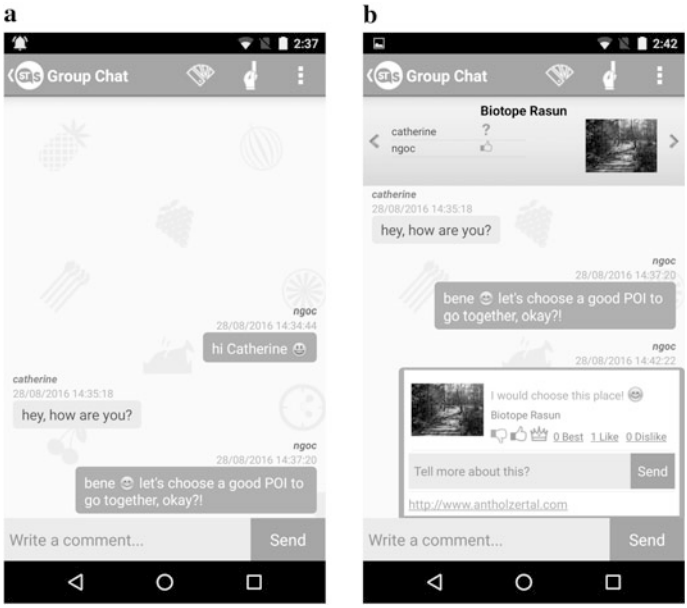

Fig. 2 **a** Group chat and **b** group chat with proposed items

preferences. The panel is updated automatically when there is any change in the preferences expressed by any group member.

During a chat session, in case a user would like to identify other POIs to propose, in addition to those already made, she can ask for group recommendations (see Fig. 3a). System recommendations are augmented with explanations that provide a rationale for the system recommendations (e.g. referring to the item features that might draw the attention of the group members). The system also takes group members' actions and contexts into account. Specifically, the more items a user rates, the higher the importance she will have in the preference aggregation step of the recommendation computation. Similarly, a higher importance is assigned to users who are in somewhat vulnerable contexts such as bad mood, or tiredness (declared by users in their context management section of the application). The system also offers hints as supplementary information about items, which are added automatically by the system to the flow of the comments, or suggestions for better using some of the system functions. In STSGroup, the comparison between proposed items in terms of ratings (displayed as a bar chart) is additionally provided if necessary.

When facing difficulties in arriving to a final decision, any user can refer to the choice suggestion function (see Fig. 3b). Here the system computes an accumulated score for each item, based on the evaluations given by all group members; each item receives plus 2 and plus 1 for best and like feedback respectively, and minus 1 for a dislike evaluation. The ranking list and explanations are constructed with respect to this score.

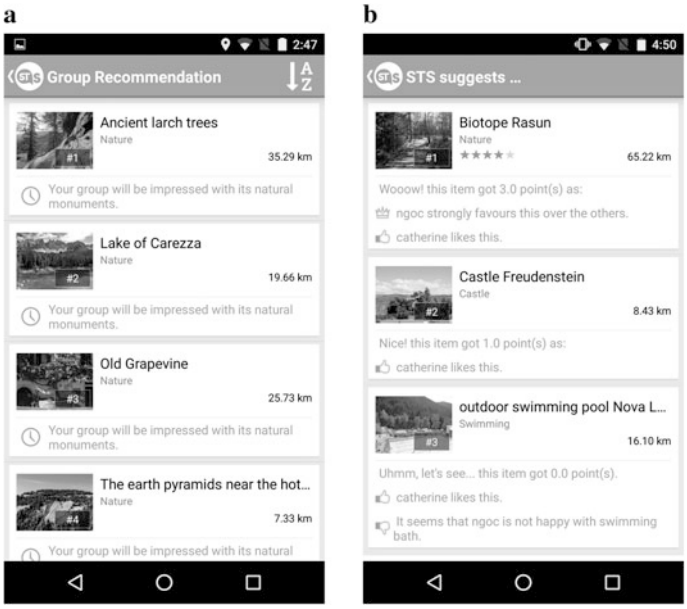

Fig. 3 **a** Group recommendation and **b** choice suggestion

4 Recommendation Logic

As we mentioned above, STSGroup monitors and uses the preferences of users while they are changing in a group decision making process. User preferences expressed in a group discussion could either be consistent with the user long-term (group-independent) interests, which are acquired by the system as item ratings, or in conflict with them. This largely depends on the other group members and on the group decision making dynamics. Thus, the system observes group members' actions during the group discussion in order to infer novel information about the current user preferences in that specific context. The system implements this idea by modelling the users' utility function and by learning it on the base of the observations of the users' evaluations for POIs.

STSGroup models the user utility function as follows:

$$f(u,i) = \sum_{k=1}^{n} w_k^{(u)} x_k^{(i)}, \tag{1}$$

here $x^{(i)} = (x_1^{(i)}, \ldots, x_n^{(i)})$ is a n dimensional Boolean feature vector that represents the item i whereas n is the number of item features. For example, if $x^{(i)} = (0, 1, 1, 0)$, this means that item i possesses the second and the third features and does not have the first and the fourth ones. In STSGroup, item features model various sources of

information including categories of the item such as “castle” or “museum”, and key words extracted from the item short-description like “waterfall” or “lake”. All information of items is obtained through a web-service provided by the Regional Association of South Tyrol’s Tourism Organizations (LTS[1]). After removing redundancy, each item is represented by 84 features in total. In Eq. (1), a vector of weights $w^{(u)}$ models the importance that user u assigns to the item attributes. We have: $w_k^{(u)} \geq 0$ and $\sum_{k=1}^{n} w_k^{(u)} = 1$. In case the user has not rated any item, all vector $w^{(u)}$ elements are set to 1/84, otherwise the vector is computed as follows:

$$w_k^{(u)} = \frac{\sum_{i \in I_u} r(u,i) x_k^{(i)}}{|i : x_k^{(i)} \neq 0|}, k = 1, \ldots, n. \tag{2}$$

In Eq. (2), I_u and $r(u, i)$ are respectively the set of rated items by user u and a rating of user u for item i before the user enters in the group discussion. The equation takes the frequency of features in the items rated by the group members into account. For instance, assume that $r(u_1, i_1) = 5$ and $r(u_1, i_2) = 2$, and the feature vectors of item i_1 and i_2 are $x^{(i_1)} = (0, 1, 1)$ and $x^{(i_2)} = (1, 0, 1)$. Based on the Eq. (2), $w^{(u)}$ is computed as follows:

$$w_1^{(u)} = \frac{2}{1} = 2,\ w_2^{(u)} = \frac{5}{1} = 5,\ w_3^{(u)} = \frac{(5+2)}{2} = 3.5$$

Then vector $w^{(u)}$ is normalized by dividing it by $\sum_{k=1}^{n} w_k^{(u)}$, so that we finally obtain the vector $w^{(u)} = (0.19, 0.48, 0.33)$, as initial preference model of the user.

We denote with $w^{(G)}$ the aggregated utility vector of group G. This, in principle, can be computed by many different aggregation functions such as *Least Misery*, *Most Pleasure*, or *Average* (Masthoff, 2015). In our system, at the beginning of the group discussion, we use the *Average* approach to initialize vector $w^{(G)}$: it is quite straightforward and considered to be acceptable by group members due to its fairness.

Different from the previous critique-based techniques, our system does not ask users to explicitly provide feedback on item features, so information about the importance of item features assigned by each group member is missing. We instead infer the user utility function based on constraints on the definition of that function that are derived from the user expressed preferences. Specifically, users can evaluate the POIs proposed for a group chat, as either: best choice; or like; or not evaluated (neither like nor dislike); or dislike. Moreover, we assume that users prefer items with larger utility, so if the user prefers item i and dislikes item i', we

[1]LTS: http://www.lts.it.

deduce that $f(u, i) > f(u, i')$. For example, during the group discussion, if the user marks as best choice a POI that is described by the attributes "castle" and "fortress", and dislikes one having the attribute "swimming", then the constraint $\left(w^{(u)}_{castle} + w^{(u)}_{fortress}\right) > w^{(u)}_{swimming}$ is inferred to hold in the definition of the user utility function. Each group member is therefore described by multiple constraints depending on what POIs she has evaluated.

Finally, the expected user utility for each POI is estimated by finding the vector of weights $w^{(u)}$ that satisfies the inferred constraints, and maximizes the cosine similarity with the vector $w^{(G)}$. Our approach assumes that the true user utility function reflects both the personal and group preferences. The vector $w^{(G)}$ is then updated by using the *Weighted Average* approach, a variant of the *Average* strategy, in order to take the role of group members into account. The implemented strategy is as follows:

$$w^{(G)} = \sum_{u \in G} \alpha(u, G) w^{(u)}, \tag{3}$$

where $\alpha(u, G)$ is a non-negative coefficient associated to user u in group G and $\sum_{u \in G} \alpha(u, G) = 1$. The coefficient depends on the activity of the user in the group: the more feedback the user provides, the higher the value of her coefficient is. Precisely, the coefficient is the proportion of the number of user's actions (POI proposals, POI evaluations and POI comments) to the total number of actions acquired from all group members. The system also increases the coefficient by a pre-defined value for users who are in somewhat vulnerable contexts such as bad mood, or tiredness.

When a user is in a group discussion and requests some group recommendations, items are ranked according to the group utility function defined as follows:

$$f(G, i) = \sum_{k=1}^{n} w^{(G)}_k x^{(i)}_k. \tag{4}$$

The system then suggests the POIs with the highest utility for the group, so the returned recommendations are the same for all group members.

5 Experimental Evaluation

The objective of the conducted experiments was to assess the usability of STSGroup, the perceived quality of the system proposed group recommendations and the group choice satisfaction, i.e., the satisfaction of the group for the POI that is finally selected by the group for a visit. We used the System Usability Scale—SUS (Bangor, Kortum, & Miller, 2008) to evaluate STSGroup usability. SUS is one of the most popular post-study standardized questionnaires and it also allows to

measure the perceived system usability with a small sample population (i.e. 8–12 users) (Sauro & Lewis, 2012).

Our user study involved 15 participants (students and colleagues). Some of them have computer technical knowledge (i.e., 6 out of 15). The users were divided into groups of 2 or 3 people. In total, we composed 6 groups; 3 groups of two and 3 groups of three members. One member in each group was assigned to be the "initiator", who starts the discussion by proposing the first POI to the group. All participants were invited to meet physically in our lab, and at the beginning of the group meeting, each one received a mobile device where STSGroup was previously installed. The experiment was performed using LG Google Nexus 5 smartphones running Android 6.0.1. The participants were asked to introduce themselves to their group's members, exchange their STS user id, and send or accept friend requests. Then we gave them the task scenario: "*Imagine that you and your group members have a plan to visit a place in South Tyrol together. According to your own preferences, STS offers you a suggestion list. Your task is first to select one or more places in the list that you think are suitable for your group to experience together and propose them to your group. Afterwards, you and the group members could discuss the proposed options and decide which place your group will choose to visit*".

We explained that STS offers each member a personal suggestion list. They, and similarly their friends, could select places in the suggestion list and propose them to their group. Additionally, they and their friends could discuss the proposed options —in the supported group chat—and eventually chose one to visit. We also requested that group members not to be at that same place during the group discussion, and to communicate with each other by only using the system chat. Finally, participants filled out a survey including three questionnaires: SUS, perceived recommendation quality and choice satisfaction which measurements are adopted from Knijnenburg, Willemsen, Gantner, Soncu, and Newell (2012). In particular, for each questionnaire item, users reply on a five points Likert scale ranging from "strongly disagree" to "strongly agree". The 10 SUS statements are: **S1**: "*I think that I would like to use this system frequently*". **S2**: "*I found the system unnecessarily complex*". **S3**: "*I thought the system was easy to use*". **S4**: "*I think that I would need the support of a technical person to be able to use this system*". **S5**: "*I found the various functions in the system were well integrated*". **S6**: "*I thought there was too much inconsistency in this system*". **S7**: "*I would imagine that most people would learn to use this system very quickly*". **S8**: "*I found the system very cumbersome to use*". **S9**: "*I felt very confident using the system*". **S10**: "*I needed to learn a lot of things before I could get going with this system*".

Each SUS item's score contribution ranges from 0 to 4. For positively phrased statements (odd numbers) the score contribution is the scale position minus 1. For negatively worded statement (even numbers), the contribution is 5 minus the scale position. To get the overall SUS score, the sum of the item score contribution is multiplied by 2.5, so the overall system usability scores range from 0 to 100. Several benchmarks for the SUS across different systems have been published (Bangor et al., 2008), and an average SUS score computed in a benchmark for cell

phones is around 67. In our user study, we used this value as a baseline to determine whether our application usability exceeds the benchmark.

The next section of the survey is composed of 5 statements about perceived recommendation quality and 3 statements about choice satisfaction, which are listed as follows: **RecQual1**: "*I liked the final choice suggested by the system*". **RecQual2**: "*The final choice recommended by the system was well-chosen*". **RecQual3**: "*I didn't like the suggested final choice*". **RecQual4**: "*The new item recommendations for a group, excluding the proposed items were relevant*". **RecQual5**: "*I didn't like any of the recommended new items*". **ChoiceSat1**: "*I was excited about the place that we have chosen*". **ChoiceSat2**: "*The chosen place fits my preference*". **ChoiceSat3**: "*I didn't prefer the chosen place, but it was fair*".

6 Evaluation Results

In this section, we report the results of the usability study, the perceived quality of the group recommendations and the users' choice satisfaction. Figure 4 shows the SUS score of each test user. Most of them gave the score that is higher than the benchmark.

Overall, STSGroup obtained a SUS score of 76 (over 15 users). We calculated one sample *t*-test to verify if the score is higher than the benchmark of 67, and got the result $t = 4.42$ and the probability associated with this score is 0.001. This means we can 99% confidence that the average SUS score of STSGroup exceeds the benchmark.

We also computed the average responses for 10 SUS statements. The highest average scores are for S6, S4 and S8. This implies that the participants have evaluated STSGroup as not complex as well as not difficult to use. They also do not think that the system is inconsistent or cumbersome, and they believe that they are able to use the system without technical help. S9, S7 and S5 received instead the lowest scores. This implies that the users were not fully confident of using the system and think that most people will not learn to use it quickly. They also found some of the functions in the system not well integrated. All these issues could be explained by the fact that in STSGroup, we support two types of recommendations

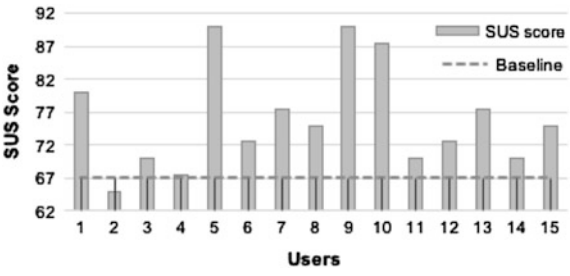

Fig. 4 System Usability Scale (SUS)

Table 1 Recommendation quality

Statement	Strongly agree (%)	Agree (%)	Neither disagree nor agree (%)	Disagree	Strongly disagree (%)
RecQual1	**26.7**	**60.0**	13.3	0.0	0.0
RecQual2	**33.3**	**53.4**	13.3	0.0	0.0
RecQual3	0.0	0.0	6.7	**53.3**	**40.0**
RecQual4	0.0	**73.3**	20.0	6.7	0.0
RecQual5	0.0	0.0	6.7	**60.0**	**33.3**

simultaneously: personal context-aware and group recommendations. It means that users are still able to use all functions that are already available in STS besides new ones designed for groups, and they can browse items appearing in their personal suggestion lists and propose them in the group discussion. With various support functions in one application, i.e. the combination between individual and group functions, users therefore may have not clearly understood the usage of each module.

Regarding the recommendation quality and choice satisfaction aspects, which are shown in Table 1, it is noteworthy that the majority of the participants (i.e. 86.7%) indicated that they liked the final choice suggested by the system (RecQual1) and found it well-chosen (RecQual2). In line with that, 14 individuals out of 15 (93.3%) disagreed with the statement "*I didn't like the suggested final choice*" (RecQual3). Next, the performance of the proposed recommendation model is remarkably high as more than a half (i.e. 11 out of 15) confirmed that "*the new item recommendations for a group, excluding the proposed items*" (RecQual4) were relevant and 93.3% of participant did not approve the statement "*I didn't like any of the recommended new items*" (RecQual5). We note that we did not check whether users were previously familiar with the recommended POIs or not, so their evaluations were based on user dependent combination of pre-existent POI knowledge and information acquired by using the system.

About choice satisfaction, the majority of participants (9 out of 15) confirmed that "*The chosen place fits my preference*" and for the remaining, 3 users neither disagree nor agree with the statement while the other 3 users disagree. However, the satisfaction with the final choice was quite high, particularly, 80% participants (12 out of 15) indicated that they are excited about the chosen place.

7 Conclusions and Future Work

In this paper, we have presented the recommendation algorithm and the interaction design of a novel mobile GRS that supports group decision making by offering a group chat environment in which a number of recommendation functions are integrated. We have argued that to make a better decision in groups, a GRS should support the whole decision process, and in this paper, we mainly focussed on

supporting the discussion stage, where group members' preferences can be elicited and shaped. The proposed algorithm exploits users' feedback during the group discussion in order to update the system definition of the users' utility functions. We have conducted a live user study where we have measured the usability of the system, the quality of group suggestions and the choice satisfaction. The experimental results have shown the usability of our system is larger than a standard benchmark and it also provides high perceived recommendation quality and group choice satisfaction.

However, the system still has a number of limitations which ultimately are linked to the difficulty to understand the true meaning of certain recommendation functions, such as the difference between individual and group recommendations. In the future, we will address this limitation and we will also make the system able to proactively propose new items when it detects that this could be valuable: for instance, when users often change preferences for items, implying that they are unsure about the current proposals. Finally, we intend to analyse the textual group members' comments while they are discussing a set of options and trying to make a decision, so that their new preferences will be extracted and inferred. We believe these functions would further improve the usability and the effectiveness of the system.

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Extending the Schema.org Vocabulary for More Expressive Accommodation Annotations

Elias Kärle, Umutcan Simsek, Zaenal Akbar, Martin Hepp and Dieter Fensel

Abstract Schema.org was founded in 2011 by the search engine companies, Bing, Google, Yahoo! and Yandex. The purpose was to develop a vocabulary which is compact and easy to use, yet powerful and expressive, to describe "things" on the Web and to make them machine read- and understandable. For the tourism sector however, the vocabulary provided in the versions up to 3.0 was too shallow to make an expressive structured description of, for example, a hotel. So far schema.org/Hotel provides vocabulary for describing a hotel's core data, like name, address and description, an email address, a phone number or offers. Detailed descriptions, like the number of beds in a room, the bed type or whether pets are allowed or not, are not possible. In this paper we present our work on an extension of schema.org towards better, more expressive annotations of accommodation data. We introduce 12 new types and 10 new properties and evaluate how this extension can be used on hotel Web sites to annotate content in a machine readable, expressive way.

Keywords Schema.org · Semantic annotation · Ontology · Hotel · Tourism

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1 Introduction

Since the invention of the World Wide Web by Sir Tim Berners-Lee back in 1989, its audience, purpose, technology and look have undergone a tremendous evolution. From a simple, distributed information management system with static HTML pages, stored on Web servers, updated only by Web administrators and read only by a handful of users, it evolved into an extremely fast growing, ubiquitous network. People all around the world consume and contribute content to the Web on a daily basis with a huge set of different devices. If the history of the Web was divided into three versions, as Bouls (Kamel Boulos & Wheeler, 2007) and Hendler (2009) did in their works, the development from users being plain consumers to users being also contributors of content, would mark the beginning of the so called "Web 2.0". It was the first time that everybody was able to create content on the Web and hence a great opportunity for the accommodation industry and other businesses to represent and advertise their enterprises and offers online. The next iteration, the "Web 3.0", is what is called the "Semantic Web". The main endeavor of this evolutionary step is to give the content on the Web a meaning in a way that machines, in this context mostly search engines, can read and understand certain pieces of information on Web sites. To accomplish that, vocabularies are required to structure or markup data on Web sites in a standardized way, which is where schema.org comes in.

In 2011, the world's biggest search engines, Bing, Google, Yahoo! and Yandex, decided to create a vocabulary, or a set of schemas, to describe "things" on the Web, called schema.org. The idea of schema.org was to provide a consolidated conceptual model for data markup inside the HTML source code of the Web site, which could be expressed using Microdata, RDFa, or JSON-LD to make the data machine read- and understandable in order to get richer search results or to use third party software to work on the data. In the last 5 years schema.org constantly evolved with the help of the four founders and a very active community on Github[1] and the W3C's public schema.org mailing list.[2]

Because of the huge variety of things to be annotated on the Web, the schema.org vocabulary often only scratches the surface of topics, as with the topic of accommodations. There are classes to describe hotels, motels or hostels, but the range of properties was fairly limited and the expressivity of the vocabulary did not exceed accommodation's core data like name, description or contact information. To change that and to make schema.org more usable and bring it closer to the real-life applications, this paper proposes an extension of the schema.org vocabulary for accommodations. It introduces new classes and properties, extends existing classes and describes how certain real-life applications can be implemented with the new concepts.

[1] https://github.com/schemaorg/.

[2] public-schemaorg@w3.org.

The remainder of this paper is organized as follows: Sect. 2 describes the motivation for the schema.org extension and Sect. 3 discusses relevant related work. Section 4 presents the results of the work and Sect. 5 gives an outlook into the future of this extension and concludes the paper.

2 Motivation

The motivation for this work is manifold. Schema.org is the de facto standard for semantically describing and publishing structured data on the Web. It is designed to be a simple yet powerful and expressive vocabulary, supported by the major search engines and a big community. It was very well received by businesses (Meusel, Bizer, & Paulheim, 2015), including the tourism sector (Kärle, Fensel, Toma, & Fensel, 2016), mostly due to the fact that the major search engines and also third party applications increasingly exploit schema.org annotations on Web sites. However, schema.org 3.0 has a limited set of concepts to describe accommodations. Therefore creating an extension to schema.org is important for enabling accommodation providers to adequately describe their products, services and offers. Schema.org-annotated Web sites of accommodation providers can help search engines provide richer search results. Automated agents like chatbots, a growing sector on the Web, can take a wider variety of actions on annotated services, for example the automated purchase of services via virtual assistants.

The following example scenario for an automated and direct booking solution of e.g. accommodation offers will showcase what might become possible with annotated Web sites and support the motivation for this work: we imagine a geographic region where all accommodation providers' Web sites are properly annotated with schema.org. The DMO[3] operates a Web site that shows room offers of the region. The Web site is based on a software that crawls all regional hotels' Web sites. It collects the schema.org annotated offers, renders them into one single user interface for visitors, and provides an API which is again schema.org-annotated to be read and understood by third-party software. The annotated offers on the accommodation providers' Web sites also feature schema.org booking actions so the software knows how to initiate a booking. This scenario shows that the proper use of schema.org annotations can make API integrations obsolete and brings back direct bookings to the DMOs or the accommodation providers.

Another motivation to build this extension is the steady development of a new layer on top of the classical Web, which has been happening in the recent years: accommodation offers are not sold over individual's sites, but over booking platforms. Commodities are sold mostly over sales platforms like Amazon or Alibaba. Google is evolving from a search engine into a question-answering engine by allowing users to reach the information they need without visiting Web sites. The

[3]Destination Marketing Organization.

Web is turning into a "headless Web",[4] where the Web sites still exist but are not necessarily visible to the end-user anymore, which makes the Web site's design useless but the actual content even more important. The information published on the Web is understood, extracted and presented to the user by other applications. The shift to the new layer gets even more obvious with the introduction of chatbot platforms (e.g. Facebook Messenger Platform) and virtual assistants such as Apple's Siri, Google Now, Microsoft's Cortana, Viv and others that make traditional browsing for finding information and completing tasks on the Web increasingly obsolete. The businesses that cannot keep up with the development of this new layer will eventually lose their online visibility. In the case of accommodation providers, online visibility is strongly related with bookability. Therefore, the bookable services should be semantically described and published on the Web so the search engines, virtual assistants and other third party applications can discover, understand and present these services to the end user.

3 Related Work

This section gives an overview of the related work on existing vocabularies and industrial data-exchange specifications for the tourism domain.

The Thematix Lodging Extension to schema.org[5] is an attempt to propose an extension to schema.org for accommodation providers. Even though it contains similarities to our work, there are significant shortcomings, including not extending the *LodgingBusiness* class and not providing concepts and properties to describe bed details. To the best of our knowledge this extension has not gone beyond being a proposal. It was also not aligned with GoodRelations, the core ecommerce model of schema.org.

There is previous work in the literature to facilitate enterprise data exchange in the travel sector. OpenTravel Alliance[6] publishes an extensive collection of XML schemas as messaging standard for the parties involved with distribution of travel related data. Global Distribution Systems[7] (GDS) are prominent adopters of OpenTravel specifications to manage message exchange between travel agencies and service providers in various domains related to tourism such as accommodation, airline and car rental. There are several academic works to create ontologies based on parts of OpenTravel specifications. For instance, the work in Vukmirovic, Paprzycki, & Szymczak (2006) proposes an ontology based on OpenTravel airline messaging specifications. Another work in Cieslik, Ganzha, & Paprzycki (2008)

[4] https://medium.com/dev-channel/the-headless-Web-de81ab21651f\#.b86qcg6n0.

[5] http://thematix.com/ontologies/travel/lodging/.

[6] http://www.opentravel.org/.

[7] https://en.wikipedia.org/wiki/Global_Distribution_System.

proposes an ontology based on the golf-related schemas of OpenTravel specifications.

AlpineBits is a subset of OpenTravel specifications which defines an interface for the exchange of touristic data. Two technical reports show partial mapping of AlpineBits specifications (Mair & Trebo, 2015) to schema.org 3.0 terms (Akbar & Toma, 2016a, b).

The Harmonise project (Dell'Erba, Fodor, Ricci, & Werthner, 2002) proposes an ontology-based mediation technique to allow touristic organizations to exchange their proprietary XML data without adopting a new standard. The mediation ontology, called Interoperable Minimum Harmonisation Ontology (IMHO), was developed by a consortium that consists of major touristic organizations and standard developers in Europe. This ontology contains the minimum common set of concepts and properties that can describe the data to be exchanged.

The main advantage of our work over the aforementioned heavyweight industrial standards is that it provides a simple way to describe the most important aspects of accommodations. Since the structured data described with a common vocabulary can be embedded in HTML, information can be shared without heavy API integrations.

The basis of our extension is the STI Accommodation Ontology (Hepp, 2013). It can be used to describe accommodation offers from an e-commerce perspective. The vocabulary is an extension to GoodRelations (Hepp, 2011), a vocabulary used to describe product-, price-, store- and company-aspects of e-commerce, which was also integrated into the schema.org core vocabulary. Schema.org is a de facto standard for structured data markup on the Web, which among other advantages, enables search engines to show richer results. Providing our work as an extension to schema.org is surely beneficial for the adoption of the vocabulary by accommodation providers.

4 Results

This section describes the outcome of the work on the schema.org hotel extension. It describes the 12 newly introduced entities and the 10 new properties to the schema.org vocabulary. Below, the new elements are described in detail and an overview can be found in Fig. 1.

4.1 LodgingBusiness

To model accommodation related information on the Web with schema.org the core entity to start with is *LodgingBusiness*. Up to now *LodgingBusiness* had four subclasses (*Hotel*, *Hostel*, *Motel* and *BedAndBreakfast*). For a more comprehensive range of lodging business types we introduce two more subclasses, *Resort* and

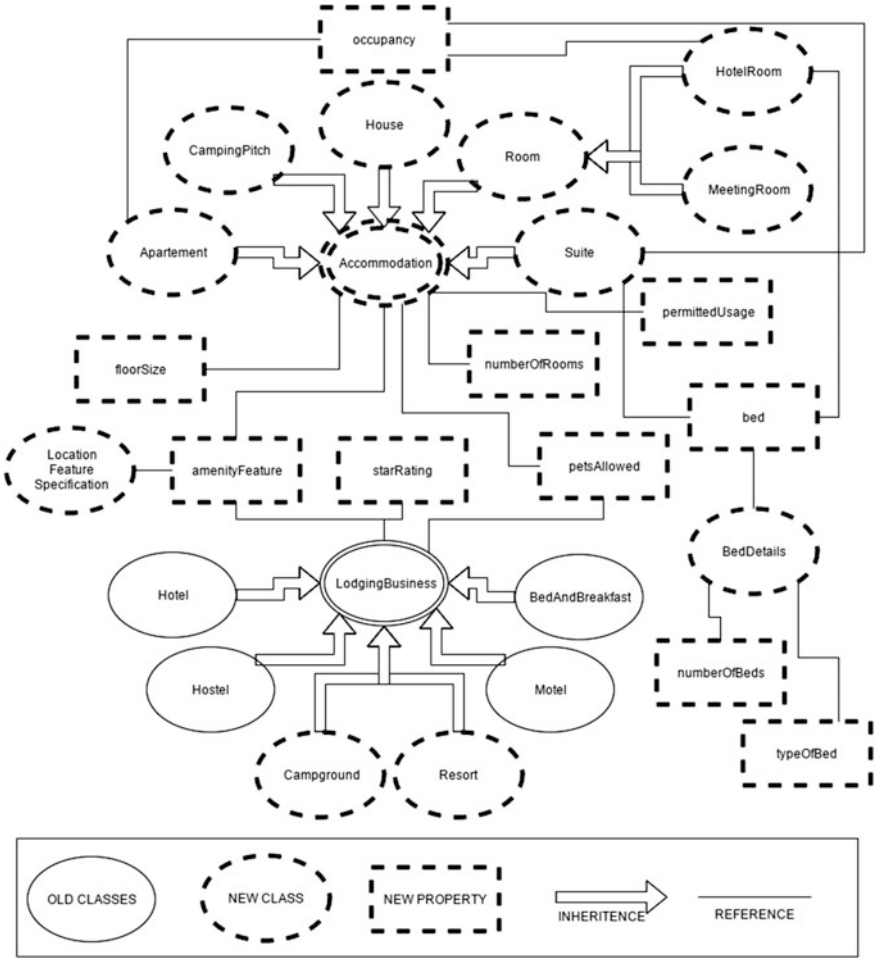

Fig. 1 Diagram of new schema.org classes and properties

Campground. To make the *LodgingBusiness* class more expressive we also introduce three new properties. An *amenityFeature* describes additional features available (with or without extra cost) along with the lodging. *AmenityFeature* appears also in the domain of *Accomodation* and *Place* and requires the type *LocationFeatureSpecification*, which is a special form of *PropertyValue* to specify a location feature. An example for such a feature is a sauna, a gym or WiFi availability. The second new property of *LodgingBusiness* is *petsAllowed*. This property is also in the domain *Accommodation* and requires either a boolean value or a text (for example if the information to be annotated wants to state, that only pets of a certain size are allowed and others not). The third new property is a very generic property called *starRating*. It expects an input of the schema.org type

Rating and is also in the domain of *FoodEstablishment*. It is used to describe the official rating for a lodging business or food establishment, which was issued typically by a national association or a standardization body.

4.2 Accommodation

So far this work made only minor improvements on the lodging business description itself. The heart of our work lies however in a new class called *Accommodation*. An accommodation is, in this context, the object that is offered for rent by the lodging business. For example, a hotel rents out rooms—hotel rooms, meeting rooms—or suites, a campground rents out camping pitches, and so on. The accommodation class is designed as a direct child of *Place* and introduces five properties. *AmenityFeature*, which has already been discussed in the section above, *floorSize*, which expects a *QuantitativeValue* and describes the size of the accommodation. *NumberOfRooms* states the number of rooms in an accommodation excluding bathrooms and closets. It expects a number or a *QuantitativeValue* as a value and is also in the domain of *SingleFamilyResidence* (not further relevant). The fourth new property is *permittedUsage*, a textual property to describe what usage the accommodation is allowed for. The fifth property is *petsAllowed*, which was already discussed in the section above.

Accommodation has five more specific types, which are *Apartment*, *CampingPitch*, *House*, *Room* and *Suite*. An apartment or flat "is a self-contained housing unit (a type of residential real estate) that occupies only part of a building, correctly, on a single level without a stair".[8] The only additional property the class introduces is *occupancy*, a *QuantitativeValue* to state how many people (including infants) are allowed to occupy the apartment. *CampingPitch* introduces no additional properties and describes typically an individual unit of a campground dedicated for overnight stays in the outdoors. The subclasses *House* and *Room* introduce no additional property but *Room* has two subclasses *HotelRoom* and *MeetingRoom*. The *HotelRoom*, a single room inside a hotel, introduces the property *bed*, which expects the type *BedDetails*—a newly introduced class. *BedDetails* has two properties: *numberOfBeds* and *typeOfBed*. The *MeetingRoom* subclass describes a room used for singular events and introduces no new properties. The last child class of *Accommodation* is *Suite* which has two additional properties *bed* and *occupancy*, which were both already introduced. A suite describes a luxury accommodation in a hotel with typically multiple rooms.

There are several ways how the connection between *LodgingBusiness* and *Accommodation* can be made. One way is by stating that a hotel contains a place which is a hotel room. To accomplish this, the property *containsPlace* from the *Accommodation* class gets assigned another *Place*, e.g. a *HotelRoom*. Another way

[8]From Wikipedia: https://en.wikipedia.org/wiki/Apartment.

Table 1 Overview of newly introduced classes and properties

Class	Property
LodgingBusiness	amenityFeature, petsAllowed, starRating
Campground	
Resort	
Accommodation	amenityFeature, floorSize, numberOfRooms, permittedUsage, petsAllowed
Apartment	occupancy
CampingPitch	
House	numberOfRooms
Room	
HotelRoom	bed, occupancy
MeetingRoom	
Suite	bed, numberOfRooms, occupancy
BedDetails	numberOfBeds, typeOfBed
LocationFeatureSpecification	

is to declare an accommodation as an offer. The *LodgingBusiness* class has a property *makesOffer* which expects an *Offer*. The *Offer* class has a property *itemOffered* which expects an input from either *Product* or *Service*. Now an accommodation is neither, but schema.org solves that issue by using the principle of "Multi-Typed Entities" (MTE). MTE means that a class or entity can be of multiple types. In this context *Accommodation* is not only a place, but it also can be a product by adding the *Product* class to the type definition.

Table 1 gives an overview of all the new classes with their newly introduced properties and Fig. 1 shows how the new classes and properties, connected with the current schema.org version.

4.3 Applications

To see the extension in action and to start evaluating how our work performs in real life we implemented the schema.org extension to real hotels. We were very lucky to find an enthusiastic CEO of a DMO who was willing to give this new, promising technology a try. Besides our own application of the new extension we also came across a company that started to use our work right away.

Mayrhofen destination Web site annotation The destination Web site of the Mayrhofen region[9] is connected to an API from Feratel[10] to retrieve hotel information and room availabilities. The information from the API comes in XML

[9] http://www.mayrhofen.at/.
[10] http://www.feratel.com/.

format but without any schema.org annotations. A wrapper, developed in a student project, converts the information from the API into JSON-LD and annotates it with schema.org 3.1. The JSON files are then stored and provided to the DMO's Web site, which accesses and renders them through an extension script of the TYPO3 content management software to the Web sites front end. In the future we will closely monitor the effect of the new annotations on the Web site and will report about it.

External work An interesting result of our work appeared independently and without us even knowing about it. Shortly after the release of our extension in

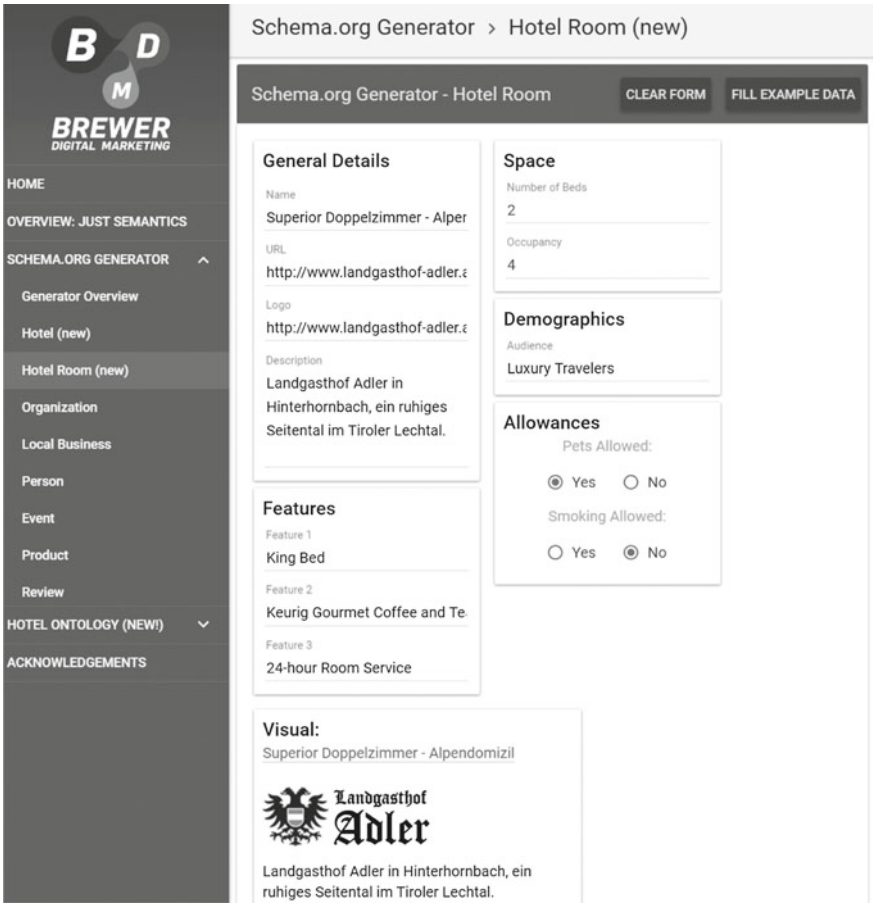

Fig. 2 Screenshot of the software made by Brewer Digital Marketing, using our schema.org extension

schema.org version 3.1 the American company "Brewer Digital Marketing" released a schema.org generator[11] that featured our new properties for the *Hotel* class and even the *HotelRoom* class. The generator does not (yet) offer the possibility to annotate room offers by hotels with the MTE principal, but makes use of most of the newly introduced properties. See an example screenshot in Fig. 2.

5 Conclusion and Future Work

We proposed a simple yet powerful extension to schema.org in order to make the vocabulary more expressive for accommodation services. After the discussion in the schema.org community group, our extension has taken its final shape and has been approved by the steering committee. It has been released as a part of schema.org version 3.1 in August 2016.[12] The terms included in the extension are mainly based on STI Accommodation Ontology. The definitions of many of the classes and properties are inspired by Wikipedia, the free encyclopedia.

Schema.org version 3.0 had limited support for annotating accommodation-related data. For instance, it was not possible to adequately describe hotel rooms. We included new subclasses for *LodgingBusiness* as well as classes and properties for describing accommodations, such as hotel rooms and meeting rooms and their features like bed details, offered amenities (e.g. WiFi). In this paper, we have given several example instances to demonstrate the possible usage of our extension for describing accommodations.

Our next steps will be to start raising awareness of the extension among accommodation providers by distributing guideline documents and organizing workshops. Given the popularity of schema.org, we expect a high adoption of the extension. We will evaluate the usage of the extension on pilot implementations and use the evaluation results as a basis for further refinement and enrichment of our extension. The success of an ontology or the adaptation of a vocabulary always depends on the difficulty of its usage. In order to make the vocabulary even more usable and to accelerate the adoption process, we plan to develop generators for schema.org markup, as well as validation tools for accommodation providers. These tools will enable them to create annotations efficiently and correctly. We are expecting that major search engines will produce richer search results by processing the structured data annotated with our extension and increase accommodation providers' online visibility. We will also demonstrate how our extension combined with schema.org actions will facilitate automated agents (i.e. automated booking agents, chatbots) in our future work. Additionally, to cover tourism domain better, new extensions for other tourism related sectors (e.g. gastronomy, skiing) will be developed.

[11] http://developers.brewerdigitalmarketing.com/generator/hotel/room.

[12] https://schema.org/docs/hotels.html.

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Reviewing Geotagging Research in Tourism

Elise Wong, Rob Law and Gang Li

Abstract Advanced medium-sharing service and mobile technologies create a large volume of geotagged data online. The characteristics of geotagged data provide a new method for tourism and hospitality researchers to analyse tourist movement and behaviour. To extend knowledge on utilizing geotagged data in the tourism and hospitality industry, this study aims to review existing geotagging research in tourism and hospitality and thus identify a potential research topic in this area. Five research categories and future geotagging research topics in tourism and hospitality are identified and discussed.

Keywords Geotagged data · Hospitality · Tourism · Literature review

1 Introduction

After the launch of commercial Internet in the 1990s, information technologies are an indispensable resource for the tourism and hospitality organization to maintain competitive advantage (Musante et al., 2009). Currently, the research on information technologies in the tourism and hospitality sector is shifted into utilizing geotagged data to examine tourist movement and behaviour. The emerging geo-referenced resources are from the advanced medium-sharing services and mobile technologies (Zheng et al., 2012, 2011). This type of data is generated by users (Vu et al., 2016) and available on the Internet for free. Users generally share and record

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georeferenced resources for personal reasons, such as sharing experience, life logging, managing multimedia content, or sports activity analysis (Zheng et al., 2009). The content of georeferenced resource is controlled by the user, and the user can add diverse information to the original resource to enhance its expression, such as geographic location, time, visual image, and textual description (Zheng et al., 2012). Owing to the characteristics of the data, most of the existing research has named them as geotagged data or volunteered geographic information; in this study, we refer to this type of information as geotagged data.

The characteristics of geotagged data create a new method for research to observe, record, and analyse human movement and behaviour (O'Neill et al., 2006), allow research to further examine and identify landmarks (Girardin, Dal Fiore, & Ratto et al., 2008b), and become an emerging research topic in computer science and knowledge discovery from database communities (Zheng et al., 2011). In the study of Zipf and Malaka (2001), they mentioned the importance of geographic information in every tourism application presumed that mobile technologies would continuously influence the tourist behaviour and cause tourists to seek for more personalized information and services. Meanwhile, the geotagging research in the tourism and hospitality field remains in the early stage, and further research in this area is needed to enhance and extend the existing knowledge. To further understand the research trend and the potential of geotagged resources in tourism and hospitality, this study aims to provide a comprehensive overview of existing geotagging articles in the tourism and hospitality.

2 Geotagged Data

Geotagging is a process of adding geospatial information, temporal information, and/or textual description of medium resources (Dickinger et al., 2008; Kádár & Gede, 2013). In addition to textual description, four other methods are also available for users to annotate geospatially and temporal information into medium resources (Dickinger et al., 2008): (1) annotated by devices, such as car navigation system, global positioning system (GPS) device, and GPS-embedded smartphone; (2) determined by users manually; (3) identified by website servers; and (4) expounded by existing documents automatically. Although most of the existing geotagging research in tourism and hospitality has focused on geotagged photos, different types of geotagged data are available on the Internet, including videos (e.g., videos posted on YouTube) and documents (e.g., articles in Wikipedia, blogs, and Twitter) (Zheng et al., 2011). However, most of the geotagging research in tourism and hospitality has focused on utilizing geotagged photos. Until recently, Guo et al. (2015) utilized data from structured tourism blogs to analyse tourist movements and to identify interesting points and user services in a designed area. Nonetheless, no study has utilized geotagged videos in tourism and hospitality yet; thus, further research by utilizing different types of geotagged resources is needed.

2.1 Advantages of Geotagged Data

Tourism organizations should understand the tourist preference and their behaviour. However, collecting tourist movement or behaviour data was not an easy task prior to the emergence of geotagged data. Previous data-collecting techniques in tourist movement studies were limited to face-to-face interviews (Forer & Simmons, 2002), questionnaires (Lau & McKercher, 2006; McKercher & Lau, 2008; Xia et al., 2009), secondary data published by the government or a tourism organization (Forer & Simmons, 2002; Li et al., 2008; Wu & Carson, 2008), observations (Xia et al., 2009), GPD systems (Shoval et al., 2011; Zheng et al., 2009), and mobile devices (Asakura & Iryo, 2007). These traditional methods are costly (for both monetary and time budget), and the volume of the data collected is usually quite small.

The emergence of geotagged data has provided a more effective and efficient method to analyse tourist movement and preference. Unlike raw data, geotagged data contain proliferation information that reflects the surrounding area and the owner of resources (Kisilevich et al., 2010a, b). The recorded and shared geotagged media by users will become digital footprints of the users, and a sequence of a geotagged medium posting on a website can reveal the spatiotemporal movement of the users in a specific area (Jiang et al., 2011; Zheng et al., 2012). Analyzing tourist movement provides useful information to researchers. Researchers also can utilize geotagged data to analyse user movement and behaviour for multiple users to identify the point of interest, attractive place, landmark, new attraction, and tourist preference in a research location (Kisilevich et al., 2010a, b). This information is useful for tourism suppliers, such as travel agents and destination management organizations, to improve their tourism plan or product design. Moreover, geotagged resources also benefit tourists because geotagged data can be searched by title, keywords, and/or location (Lau & McKercher, 2006); therefore, users with similar interests can be identified and matched, and the tourist searching time can be reduced (Dickinger et al., 2008).

2.2 Challenges

As mentioned above, geotagged data are useful for researchers to analyse tourist movement and behaviour. However, several challenges have also been identified from reviewing existing geotagging literature and been discussed by a few studies.

First, the potential and uniqueness of geotagged data are mainly accounted by the embedded geographic, temporal, and textual information, but some of the geotagged resources might contain incorrect information because of human or device error (Girardin et al., 2008a); hence, considerable geotagging research needs to conduct further processes to eliminate those incorrectly tagged data from data sets.

Second, geotagged data (for textual information) are multilingual in nature. The resource developed by Zheng et al. (2011) indicated that such characteristic is one of the major challenges in analysing textual information from geotagged photos. In fact, most of the existing geotagging literature reviewed in this study has analysed only geotagged photos in English (except Guo et al., 2015), and geotagged data from non-English users are not covered.

Third, nearly all of the geotagging research in tourism and hospitality has collected data from Flickr and Panoramio, which might be because other medium-sharing websites, such as Instagram API, require scholars to seek for owner consent (Instagram, 2016b) before downloading and utilizing photos, whereas Flickr and Panoramio API do not have this rule and requisition. However, Flickr and Panoramio have fewer numbers of users than the other mentioned medium-sharing websites. According to an Instagram press release in 2016, 500 million Instagram users exist worldwide (Instagram, 2016a). By contrast, only approximately 112 million Flickr users globally were recorded at the end of 2015 (Digital Stat Articles, 2016). Thus, examining geotagged data from Flickr and Panoramio might reflect a small proportion of Internet users to extract information on travel movement and behaviour. Researchers might collect a larger number of tourist photos from Instagram and estimate the tourist movement and behaviour more accurately than using data from Flickr. Moreover, given that using geotagged data from Flickr and Panoramio does not require consent from the photo owner, privacy and ethical issues might arise (Girardin et al., 2008a).

Handling and analysing geotagged data need specific analysis skills and knowledge. Research needs to have extensive programming and applied mathematical knowledge to handle the large volume of data. Utilizing geotagged data might be a challenge for the tourism and hospitality scholars.

3 Research Methodology

In June 2016, all geotagging-related articles in tourism and hospitality were identified from Google Scholar (https://scholar.google.com.hk/), Science Direct (http://www.sciencedirect.com/), and EBSCOHOST (https://www.ebscohost.com/)—the three most popular and largest search engines and online database (Law et al., 2010). The keywords of "geotagged," "geotagging," and "geo-references," with each of the terms "tourism," "travel," "hospitality," and "hotel," were used to search for geotagging-related articles in academic journals and conference proceedings. References cited in published articles were also traced. In total, 30 published articles were determined to be relevant for this study. Table 1 lists the research categories, descriptions, and listed articles. In the following section, the key finding and discussion for each research category are presented.

Table 1 List of geotagged research in tourism and hospitality

Research categories	Description	List of publications
Geotagged data collection & preprocessing	About the development of new data collection or preprocessing methods	Da Rugna, Chareyron, and Branchet (2012); Girardin et al. (2008a, b), Guo, Li, and Sun (2015)
Geotagged data analysis	About the development of new data analysis methods to analyzegeotagged data	Crandall, Backstrom, Huttenlocher, and Kleinberg (2009), Farzanyar, and Cercone (2015), Garcia-Palomares, Gultierrez, and Minguez (2015), Girardin et al. (2008b), Kalogerakis, Vesselova, Hays, Efros, and Hertzmann (2009), Kisilevich et al. (2010a, b), Lee, Cai, and Lee (2013), Zheng, Zha, and Chua (2012)
Tourism movement & tourist behavior	About the examination of tourist flow, interested attraction, preferred service and/or tourist activities in a region or city level	Kadar, and Gede (2013), Leung, Vu, Rong, and Miao (2016), Sun, Fan, Helbich, and Zipf (2013), Vu, Leung, Rong, and Miao (2016), Vu, Li, Law, and Ye (2015)
Tourism recommendation system/application	Focusing on the development of new methods to improve existing recommendation systems or applications	Cao, Luo, Gallagher, Jin, Han, and Huang (2010), Jiang, Wang, and Yu (2011), Jiang, Yin, Wang, and Yu (2013), Kurashima, Iwata, Irie, and Fujimura (2013), Majid, Chen, Chen, Mirza, Hussain, and Woodward (2012), Mamei, Rosi, and Zambonelli, (2010), Okuyama, and Yanai (2013), Xu, Chen, and Chen (2015)
Others	Research approach and focus vary	Chareyron, Da-Rugan, and Raimbault (2014), Dickinger, Scharl, Stern, Weichselbraun, and Wober (2008), Donaire, Camprubi, and Gali (2014), Onder, Koerbitz, and Hubmann-Haidvogel (2014), Zanker, Fuchs, Seebacher, Jessenitschnig, and Stromberger (2009)

4 Findings

The geotagging research in tourism and hospitality remains in the nascent stage. Most of the geotagging articles reviewed in this study (24 out of 30) were published in computer science and information technology journals or conferences. These articles have concentrated on the technical aspect of analyzing and/or utilizing geotagged data in tourism, such as developing new data-mining methods for geotagged blog data to analyse tourist movement (Guo et al., 2015) or constructing a new method to provide tourism recommendations (Cao et al., 2010; Jiang et al., 2011; Majid et al., 2012). Seven geotagging articles have recently been published in tourism and hospitality journals and conferences, and these articles have concentrated on utilizing geotagged photos to understand or analyse tourist movement and behaviour explained with related theories.

On the basis of the research aims and objectives, five research categories were classified, and their related articles are discussed in the following subsections.

4.1 Geotagged Data Collection and Preprocessing

As mentioned earlier, geotagged data are not limited to photos but also include other media, such as videos and documents, that users can annotate with geographical, time, or/and textual description and information. Table 2 shows the data source and types of geotagged data used in the reviewed articles. To ensure that generated results are valid and reliable, most of the geotagging research has removed the noise data from the collected data; for example, a photo has incorrect geographic information and timestamp. In case of tourism, geotagging articles have also treated the photo of residents as noise data. Thus, considerable geotagging research in tourism has removed this kind of photos in the data-preprocessing stage. Two articles have suggested a method to separate photos taken by residents from those of tourists. Girardin et al. (2008a) were the first to publish geotagging research in tourism. They used geotagged photos from Flickr with the roaming signal provided by a telecom company to determine the tourist movement in Rome and provided a method to extract tourist photos from the collected photos. The

Table 2 Type of geotagged data used in geotagged research in tourism and hospitality

Type of geotagged data used	Source of the data	No. of publication
Geotagged photo	Flickr	20
	Panoramio	3
	Multisource	
	Flickr and Panoramio	2
	Flickr and cell phone roaming signal	1
Structured tourism blog	qunar.com	1

authors suggested using the presence in the area over a period of time to determine whether the photographer is resident, and this method has been further adopted by other geotagging research in tourism, such as Girardin et al. (2008b), Sun et al. (2013), and Kádár & Gede (2013). The study of Da Rugna et al. (2012) mainly introduced a method to extract tourist-geotagged photos from those of residents. They suggested that researchers should use multiple factors to separate tourist photos from resident photos. The factors included (1) the timeline of each photo taken within a location, (2) the number of place visit within a city, (3) the number of day in the country, (4) the number of the visit within a period, and (5) the number of days between two visits.

All the geotagging articles discussed above have focused on analyzing tourist movement and behaviour using geotagged photos. Recently, Guo et al. (2015) developed a new data-mining method to collect geotagged data from structured tourism blogs to analyse point of interest, tourist movement, and tourist-used service in a specific area, as well as further extended the data collection technique in the geotagging research in tourism. Table 3 summarizes all the data analysis processes and methods found from the reviewed geotagging articles.

4.2 Geotagged Data Analysis

The majority of geotagging research in tourism has been concerned with developing new data analysis methods. Most of the articles have focused on developing new methods to estimate geotagged photo location or determine tourist attraction. For example, Kalogerakis et al. (2009) and Crandall et al. (2009) established a method to estimate photo location without any geospatial curve. Kisilevich et al. (2010a, b) and Lee et al. (2013) constructed a new method to determine popular attractions from geotagged photos.

Kalogerakis and the research team (2009) utilized a modified hidden Markov chain model to identify photo locations. The model was developed based on the temporal and visual features of collected photos. With a similar research approach, Crandall et al. (2009) used visual, temporal, and textual information collected from photos to estimate the photo location and indicated that using visual and temporal information can estimate locations more accurately than using textual tag data.

Several articles have also used software to handle the data analysis of geotagged data. For example, Girardin et al., (2008a, b) used designed software—Urban dynamic—to analyse geotagged photos based on map visualization; Garacia-Palomares et al. (2015) used a geographic information system program to analyse geotagged photos and based on density map and descriptive statistics to identify popular attraction in eight European cities.

The article presented by Kisilevich et al. (2010a, b) suggested a research framework to analyse geotagged photos from a visual analytic approach; the research framework contained seven tasks that aimed to identify attraction and tourist behaviour at the city level. For the article that aims to develop a new method

Table 3 Geotagged data analysis processes and methods

Data analysis process			
Preprocessing method	Purpose	Method	Articles
	Separate photos taken from residents and tourists	Girardin et al. (2008a) advised method, using presence in the area over a period of time	Girardin et al. (2008a, b), Sun et al. (2013), Kadar and Gede (2013)
		Used the photographer profile	Vu et al. (2015)
		Multi-factors	Da Rugna et al. (2012)
Estimate Location/attraction	Purpose	Method	Articles
	Determine the point of interest or attraction from the collected geotagged data	DBSCAN	Kisilevich et al. (2010a, b), Zheng et al (2012)
		P-DBSCAN	Kisilevich et al (2010a, b), Leung et al. (2016), Majid et al. (2012), Vu et al. (2015, 2016), Xu et al. (2015)
		K-mean	Mamei et al. (2010)
		Mean shift	Cao et al. (2010), Crandall et al. (2009), Farzany and Cercone (2015), Jiang et al. (2011, 2013), Kurashima et al. (2013)
		Hierarchical clustering	Okuyama and Yanai (2013)
		Counting	Kadar and Gede (2013)
		Modified hidden Markov model	Kalogerakis et al. (2009)
		Combined method	
		Kernel density estimation & spatial scan statistics	Sun et al. (2013)
		DBSCAN & association rules mining	Lee et al. (2013)
		Density map & descriptive statistics	Garcia-Palomar et al. (2015)
Estimate tourist flow/movement	Purpose	Method	Articles
	Estimate the tourist based on the identified location and temporal information	Markov chain	Vu et al. (2015), Zheng et al. (2012)
		Spatial statistical indicators	Garcia-Palomar et al. (2015)
		Apriori-based algorithm	Farzany and Cercone (2015)
		Combined method	
		Markov chain + topic model	Kurashima et al. (2013)

(continued)

Table 3 (continued)

Data analysis process			
Analysis textual information	Purpose	Method	Articles
	Using textual data to analyze tourist behavior	GATE	Leung et al. (2016)
Determine representative textual tag	Purpose	Method	Articles
	Determine the representative textual tag which aims to reduce user search time	TF—frequency-inverse document frequency (tf-id) value	Majid et al. (2012)
		Vector space model (VSM)	Crandall et al. (2009), Jiang et al. (2011), Jiang et al. (2013)
		Computing the frequency	Cao et al. (2010)
		Computing the uniqueness of the tag score	Okuyama and Yanai (2013)
Determine representative photo in a location	Purpose	Method	Articles
	Determine the representative photo for a location	Spectral clustering	Jiang et al. (2011), Jian et al. (2013)
		Computing the frequency	Cao et al. (2010)
		Computing the uniqueness of the photo score	Okuyama and Yanai (2013)

to determine popular attractions, Kisilevich et al. (2010a, b) developed a new density-based clustering algorithm (P-DBSCAN) to determine popular locations. The P-DBSCAN was developed based on DBSCAN (Ester, Kriegel, & Sander et al., 1996). Both methods are nonparameter clustering that do not need to determine the number of clusters in advance and support clusters with arbitrary shape and efficiency on large-scale data (Kisilevich et al., 2010a, b; Zheng et al., 2012; Vu et al., 2015, 2016). Therefore, both methods are suitable to determine the location and event from geotagged sources, but the clustering definition between the two methods is different. P-DBSCAN does not define density based on the number of photos taken in a point but uses the number of photographers to define the density that enables filtering outliers effectively; thus, it can determine popular locations accurately. Numerous geotagging articles in tourism have also used this P-DBSCAN method, such as Majid et al. (2012), Xu et al. (2015), Vu et al. (2015, 2016), and Leung et al. (2016). The other study presented by Lee et al. (2013) combined the DBSCAN method with the association rule-mining technique to determine points of interest; using the combined method to determine location

which can generate a more accurate result, but the analysis process is more complex than a single method approach.

Besides location, tourist movement has also been estimated via new methods in two articles. Zheng et al. (2012) adopted the Markov chain model to estimate tourist routes and further classified tourists into busy and relax trip tourists using the modified longest common subsequence. Later on, Vu et al. (2015) also adopted the Markov chain model to estimate the tourist flow in Hong Kong. Farzanyar and Cercone (2015) used two data-mining techniques-mean-shift clustering algorithm and MapReduce a priori-based algorithm through Hadoop-to estimate the tourist attraction and flow in Europe.

4.3 Tourism Movement and Tourist Behaviour

The tourist movement and behaviour research category focused on examining tourist flow, interested attraction, selection of tourism service, and/or tourist activities. Five geotagging articles were classified into this category, and all these articles have examined tourist movement and/or tourist behaviour in a city level. No study has been conducted in any Southeast Asian cities yet.

Two studies under this research category have focused on investigating tourist attractions. Kádár and Gede (2013) identified locations in Budapest from geotagged photos collected from Flickr, and Leung et al. (2016) focusing on investigating less popular tourist attractions in Hong Kong. Aside from tourist attractions, the study presented by Vu et al. (2015) also analyzed tourist movement and indicated that tourists tend to go to nearby attractions. The study also compared the movement and behaviour between Western and Asian tourists and showed the different movements and popularity of attractions between these two types of tourists.

Researchers also have utilized geotagged photo data to analyse tourist preferences and activities. Sun et al. (2013) analyzed the distribution of tourist-selected hotels in Vienna in each season and indicated that seasonality does influence tourist's selection of hotels selection of hotel. Vu et al. (2016) used geotagged photos to analyse tourist activities in Hong Kong parks and used textual information to identify tourist activities.

4.4 Tourism Recommendation Systems/Applications

Geotagging research in this category is concerned with developing a new method to improve tourism recommendation systems/applications to facilitate searching. Eight articles were classified into this category, and those articles can further be divided into two subthemes of suggesting a location or suggesting a route. Given that this research category focused on developing a tourism recommendation method or system, the articles in this category have tended to present a detailed description of the data collection and analysis processes. Articles commonly evaluate the

performance of a designed system by comparing the designed tourism recommendation system/method with another existing system.

In the early stage, articles have focused on developing a system/method to provide attraction or location suggestion to users. For example, Mamei et al. (2010) developed an application to provide location recommendation in a fixed area; this application was developed based on user travel history, but it was only suitable for the tourists who had been visiting more attractions than those who visited a few. The other study presented by Cao et al. (2010) developed a worldwide tourist recommendation system that aimed to minimize the searching time of tourists. The system enabled users to use visual images and keywords to search for tourism locations and attractions.

Later on, tourism recommendation articles have focused on developing a system that provides recommendations considering contextual information and that allows for personalized suggestions. The research presented by Jiang et al. (2011) was the first article to use geotagged information with other contextual information, such as textual tags, visual images, and user similarity to provide personalized tourism recommendation. Majid et al. (2012) and Xu et al. (2015) developed tourism recommendation systems based on travel history and user's current contextual information, such as weather and time, to provide a suggestion. The major difference between the two systems is that Majid et al. (2012) used another user travel history to predict tourist preference, whereas Xu et al. (2015) used the travel histories of both user and other users.

Previous tourism recommendation systems relied on the travel history of the user or other users to predict tourist preference; thus, they were only useful for the users who had rich travel experiences. The recommendation system developed by Jiang et al. (2013) overcame this problem by using user interests, current location, and time to provide relevant recommendations for the user, and it was more suitable for the user with less travel history.

Two articles have developed route recommendation systems as well. Okuyaman and Yanai (2013) developed a tour recommendation system for a given area. Kurashima et al. (2013) established a personalized travel route recommendation system; this system also considered user current context and user interest to suggest a route with travel time and transportation method.

4.5 Others

Five articles were classified into this research category because their research theme and approach differ from those of other geotagging research in tourism. All these articles were published in tourism and hospitality-related journals and conferences, and their research theme was beyond the other geotagging research, such as tourist movement and tourist attraction. These articles have applied geotagged photos to analyse and interpret other tourism issues and phenomenon. For example, Dickinger et al. (2008) discussed and presented a method to annotate geospatial information for

tourism resource automatically and indicated that geotagged tourism resources can assist the searching experience of tourists; Zanker et al. (2009) developed a method to annotate tourism and hospitality products automatically based on geotagged information; Chareyron et al. (2014) presented a conceptual paper to discuss the potential and challenge of using geotagged data to develop research in tourism. Except the works from Dickinger et al. (2008) and Zanker et al. (2009), the other articles in this category did not use any data-mining method or algorithm to analyse geotagged data, which indicates that geotagged data can be handled and analyzed without programming knowledge. For example, Donaire et al. (2014) used 1786 geotagged photos from Flickr to analyse photographer view. The article used content analysis to categorize the photo scenes into four types of tourists views, namely, nature, heritage, culture, and tourist service. Ward's clustering method was also used to determine four groups of tourists. Önder et al. (2014) used geotagged photos from Flickr to forecast the number of tourists spending nights in both regional and city levels. The study only used polynomial regression analysis to estimate tourist demand and found that geotagged photos are only useful for estimating the number of tourists spending night in city level instead of regional level.

5 Conclusions and Future Research

The present study has reviewed 30 geotagged related articles in tourism and hospitality, and provided an updated geotagged data research approach in tourism and hospitality. The study also classified existing tourism geotagged research into five categories based on the research aims and objectives, and identified that the majority of tourism geotagged research was focused on the technical aspect of analysis and/or utilizing geotagged data in tourism. Only few research was concentrated on utilizing geotagged data for tourism management. Further research in utilizing geotagged data for tourism management is needed. Here, we would like to summarize the findings and to envisage the future research work along this line.

Existing tourist movement literature has indicated that tourist movement and behaviour are influenced by different factors, such as time and expenditure budget, personal factors, and knowledge of the destination (Lew & McKercher, 2006). Therefore, the analysis of the overall tourist behaviour and movement in a region or city only provides general information for tourism organizations. To better understand different tourist movement and behaviour, future geotagging research should classify tourists based on their demographic information, textual tag language, and visual image, as well as compare different tourist movements and behaviour in a region or city.

Geotagging data can be used to analyse tourist-preferred services in a region or city in addition to tourist attractions. For example, Sun et al. (2013) used geotagged data to investigate the distribution of hotels in Vienna. Understanding tourist service preference can assist service providers to develop and improve their products and services and help researchers further understand tourist behaviour in different

cities and countries. Hence, future geotagging research can further analyse tourist-preferred services, such as restaurants and transportation, at a regional or city level. Most of the geotagging research has been concerned with developing tourism recommendation systems, but those articles have only focused on providing popular attractions or routes for the tourists. Information regarding popular attractions or routes should be easily accessed on the Internet, but tourists spend a lot of time to find less popular attractions and routes in a destination. Accordingly, future research should try to identify less popular but unique attractions and routes from geotagged data (Chareyron et al., 2014) and to provide a diverse tourism recommendation for tourists.

Geotagged data are a potential resource for tourism and hospitality research, but not every tourist will upload a photo online or tag related information into media. Thus, geotagged data might reflect specific types of tourist behaviour and movement only. As suggested by Crampton et al. (2013), researchers should use multiple sources to ensure geotagging research reliability. Therefore, future geotagging research should try to use different sources with geotagged data to analyse tourist movement and behaviour. For example, researchers can cooperate with local destination management organizations and use both surveys and geotagged data to analyse and understand tourist movement and behaviour to cross check the results between two data sources to ensure that the results are reliable. Moreover, most of the existing geotagged research in tourism and hospitality only used one single method to collect geotagged data. Indeed, as mentioned early, there are different types of geotagged data available on the Internet, scholars should consider collecting different types of geotagged data from different sources to analyse and compare tourism movements and behaviour.

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Localization of National Tourism Organizations Websites: The Case of ETC Members

Emanuele Mele and Lorenzo Cantoni

Abstract The number of international tourist arrivals is increasing substantially both globally and, in particular, in Europe. Given the role played by information and communication technologies (ICTs) to inform visitors from international markets, the process of translating destination websites is acquiring a central position. The stiff online competition not only requires national tourism organizations (NTOs) to tailor tourism services, but also to shape their communication strategies according to the cultural background and habits of their different audiences. Such adaptation is defined as "localization", a well-recognized practice in the ecommerce and marketing sectors as well as in the tourism sphere. The goal of the present study is to examine the actual use and integration of website localization practices at NTOs. To accomplish this, IT and marketing specialists are interviewed, providing an overview of adaptation activities at eleven NTOs which are members of the European Travel Commission (ETC). Results show that localization processes are recognized as important for marketing and communication purposes on destination websites.

Keywords etourism · Localization · NTO

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1 Introduction

According to recent statistics issued by UNWTO (2016), in 2015 the number of international tourist arrivals in the world reached 1.184 billion and 608.6 million in Europe. The figures show a growth of 4.4 and 4.9% respectively. Given the role played by ICTs to inform visitors from international markets, the process of translating destination websites is acquiring a central position. As an effort to overcome online competition, NTOs are promoting tailor-made products and services. Nonetheless, these choices need to be supported by a localized online communication (Mele, De Ascaniis, & Cantoni, 2015). The process of localization describes all those activities that aim at "modifying products and services to account for differences in distinct markets" (LIS, 2007, p. 11). According to the American Translators Association (ATA) (2002), localization is defined as "the process of customizing a product for consumers in a target market so that when they use it, they form the impression that it was designed by a native of their own country" (p. 4). Within the area of online communication, this set of adaptation practices describes the customization of multimedia contents (including their translation) and layout to account for the cultural background of a specific audience (Tigre Moura, Gnoth, & Deans, 2014). Cantoni & Tardini (2006) specify that localization needs to consider all those elements that vary across cultures. For example, this is the case for units of measure, calendars, and currencies, together with historical and folkloric notions. Research by Achkasov (2015) adds that the use of effective keywords for search engine optimization (SEO) is instrumental for localization practices. Indeed, a customized website version has to satisfy the queries of the local audience to compete online. Despite the recognized importance of localization within the marketing and ecommerce sectors (Wang, Peng, Sia, Tong, & Ku, 2016), more research needs to be done in the tourism area (Tigre Moura et al., 2014). More specifically, none of the so-far available studies provides an overview on the actual state of website localization practices at destination management organizations (Mele, De Ascaniis, & Cantoni, 2016). To accomplish this goal, the present study entails interviews with IT and marketing specialists from NTOs which are members of ETC.

2 Literature Review

The growing number of tourists employing ICT during the travel-planning phase is pushing destination marketing organizations (DMOs) to enhance their Internet presence (Gibbs, Gretzel, & Noorani, 2016) continuously. Websites are inserted into a specific external environment, which is composed by information competitors, substitutes, and users. Thanks to the Web 2.0, online visitors are able to share suggestions (i.e. user generated content) about destinations (Inversini & Cantoni, 2013). Given the abundance and availability of travel information on the Web, the

expectations of Internet users are rising (Lee & Gretzel, 2012). To answer to this trend, tourism products and services are often customized to meet the needs of potential consumers, who compare different websites to choose the most suitable offer (Jin, He, & Song, 2012). Within this context, NTOs' websites aim at providing information and promoting experiences at the destination especially for international publics (Pike, 2008). Hence, it becomes clear that these organizations are constantly confronted with the issue of making their communication strategy appealing. A recent study by Choi et al. (2016) further explores this aspect, by showing that DMOs' websites need to capture the attention of the visitor by making them feel at the destination and raising their knowledge.

To be effective, the communication and promotion of destinations to international markets requires the translation of multimedia content. According to research by the European Tourism Association (2016), 90% of online visitors choose their native language before deciding whether to purchase a product or service. In addition to that, language translation needs to be supported by local SEO expertise. Achkasov (2015) writes that textual elements need to be relevant, appealing, and responding to appropriate keywords. Without these components, the website will inevitably fail its intended communication purposes toward the audience. Both textual translation and SEO adaptation are part of the so-called "localization". This concept describes those set of activities that aim at "modifying products or services to account for differences in distinct markets" (LISA, 2007, p. 11). According to the American Translators Association (ATA) (2002), localization is defined as "the process of customizing a product for consumers in a target market so that when they use it, they form the impression that it was designed by a native of their own country" (p. 4). Within the tourism area, localization takes also into account those elements that vary across cultures. Among them, Cantoni and Tardini (2006) highlight dates and figures, currencies, measures and rules. The authors add that pieces of information relating to local history, religion, or geography need to be adapted too. Writing "*Hotel X is near Assisi […] and […] St Francis's Basilica* is fully understandable by people who know where Assisi is, who St Francis was […]" (p. 110), while this may appear confusing for tourists from China, for instance. Given the role that pictures and videos have in presenting the destination, their adaptation must be taken into account as well (Stepchenkova, Kim, & Kirilenko, 2014).

The centrality of culture within localization activities is justified by its impact during information and planning stages. A study by Frías et al. (2012) shows that the creation of destination image thorough information sources (including the Internet) is affected by the cultural background of visitors. More specifically, the researchers refer to those tourists who have high Uncertainty Avoidance, namely: the relatively strong preference (compared to those who are low on this characteristic) for structured and clear situations over uncertain ones (Hofstede, Hosfstede, & Minkov, 2010). Thus, the tourists from France or Italy perceive the Internet as less reliable than those from UK. Such findings should push NTOs to stress the reliability of content and data privacy when communicating with high Uncertainty Avoidance cultures (Frías, Rodríguez, Castañeda, Sabiote, & Buhalis, 2012). On

the same lines, a study by Huang et al. (2013) examines the effect of culture on tourists' intention to travel. Findings suggest that, within the context of Chinese tourism, mystery and cultural congruency increase the desire to visit a destination. Indeed, the presence of novelty in travel narratives is necessary to feed the desire of temporary freedom and exploration of the unknown, which are intrinsic tourism components (Robledo & Batle, 2015). This assumption is also confirmed by Tigre Moura et al. (2014), who show the negative effects (i.e. boredom) of complete cultural localization on online visitors' destination image and willingness to travel. While the co-existence of novelty and familiarity may appear as a contradiction, Toyama and Yamada (2012) explain that recent cognitive science classify these two concepts as separate ones (instead of opposite). Within the context of Japanese tourism, the researchers suggest destination marketers to highlight the novelty of the place, while providing necessary information to make it understandable to the reference audience (hence increasing familiarity) (Toyama & Yamada, 2012). The localization of textual content is particularly important for the promotion of cultural tourism. Indeed, tailored narratives can improve the transmission of the significance that host cultures attribute to their heritage and enhance visitor experience (Ndivo & Cantoni, 2016).

Despite its attractiveness in terms of tourism, Europe shows a need for heritage revival (Egberts & Bosma, 2014). This concept is defined as "a meaningful historical experience for the audience, […] offering opportunities for personal development […]" (p. 16) with the goal to make visitors aware of heritage and history. Related to the tourism area, a study performed by Ardissono et al. (2012) provides an overview of practices related to content adaptation for cultural heritage. More specifically, the authors state that dealing with these type of experiences requires attentive content selection, because of the enormous amount of information available and the risk of overloading online visitors (Ardissono, Kuflik, & Petrelli, 2012). Given the importance that ICT has in heritage communication and promotion, Mele et al. (2015) explore this topic on three European NTO websites. The study aims at understanding how World Heritage Sites (WHSs) are localized for the US-American and Italian publics. Findings show that multimedia contents are adapted according to the audience of reference and the representation of cultural values varies across different versions. A consequent explorative study by Mele et al. (2016) examines the promotion of attractions and services on three European NTO websites. As for the previous research, results show a clear commitment of NTOs to adapt online contents to meet the needs and preferences of the reference publics (i.e. US-American and Italian tourists) (Mele et al., 2016). At this regard, it is important to underline that despite the presence of localization activities, research shows that these practices need to be followed by assessment strategies to understand whether they are meeting user expectations (Shia, Chen, Ramdansyah, & Wang, 2016). Finally, despite the recognized importance of content adaptation for marketing and communication purposes in the tourism area, there is a lack of studies examining the existence and integration of these practices from a managerial viewpoint (Mele et al., 2016). Hence, more research is needed to

explore the importance and presence of such activities, together with existing assessment strategies, at DMOs in Europe and their branches abroad.

3 Method

The present research aims at providing an overview of localization practices and activities at NTO members of ETC. Among their roles, tourism organizations at the national level have the aim to promote the destination to international markets (Pike, 2008). Hence, it is reasonable to assume that they represent the best study case to explore the actual integration of adaptation processes within the area of tourism marketing and communication. Established in Norway in 1948, ETC is an organization that has three aims (European Travel Commission, 2016): (i) promoting Europe as a tourist destination; (ii) supporting the collaboration and information exchange among NTOs; and (iii) providing partners and other concerned parties with statistics and trends about inbound tourism. Currently, ETC gathers together 32 NTOs in the European geographical zone.

ETC members were invited to participate to a 30 min open-ended interview. Apart from being one of the most diffuse qualitative techniques, this method was chosen because it would allow interviewees to voice freely their opinions and thoughts (Turner, 2010). Interviews were conducted in English by one researcher in the period July 2015–October 2016. After 3 months, researchers collected data from eleven NTOs (see Table 1). Participants could indicate two dates for availability and they had the possibility to opt for a written open-ended interview. The latter was realized by employing the online survey platform Qualtrics (qualtrics.com).

Table 1 ETC NTO members who participated in the study

NTO name	Website
Croatian national tourist board (CNTB)	www.croatia.hr
Czech tourism	www.czechtourism.com
German national tourist board (GNTB)	www.german.travel
Toerisme vlaanderen (TV)	www.visitflanders.com
Hungarian tourism ltd.	www.gotohungary.com
Tourism ireland ltd.	www.ireland.com
Innovation norway	www.visitnorway.com
Polish tourist organisation (PTO)	www.poland.travel
National tourism organisation of Serbia (NTOS)	www.serbia.travel
Slovenian tourist board (STB)	www.slovenia.info
Switzerland tourism	www.myswitzerland.com

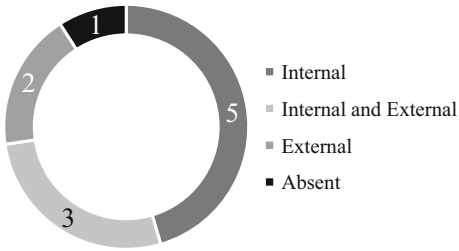

Fig. 1 Localization practices at eleven ETC NTOs

Questions covered four macro areas regarding adaptation practices and activities: (i) current state of localization processes; (ii) market research for online content creation and selection; (iii) most important adaptation activities; and (iv) use of key performance indicators (KPIs) to assess the effectiveness of marketing and communication ad hoc choices. These areas were selected by the researchers following previous studies on the topic (Mele et al., 2015; Mele et al., 2016).

Interviewees were content editors, IT or marketing managers, who declared themselves prepared to discuss about localization practices. In an effort to avoid misunderstandings with "geo-localization", the researchers added an explanation of it to the request for participation. Interviewees' names and organizations are hereafter kept under complete anonymity for privacy reasons.[1]

4 Results

The first part of the interview addressed the actual state of localization processes at the NTOs. Ten out of eleven representatives declared that their organization integrates these activities into communication strategies to address key markets. The operationalization of such processes appears to vary, as indicated in the following table (see Fig. 1).

Five NTOs assign localization practices to marketing offices, who are based either at the headquarter or at branches abroad. The selection of online content derives from the coordination of joint efforts. At this regard, "Interviewee_N_1" declared:

> We have our own established companies in the strategic markets. Concerning digital we are translating our image content, which is like a brief description […]. The deeper content, which describes certain cities or natural parts, is translated only for the markets where we are maintaining marketing campaigns. This is modified by the headquarter and then is checked again by the markets.

The reported text highlights a cost-saving aspect of localization. Namely, the translation of online contents is applied only when the activity or location is

[1]Exception are made for those pieces of information that can be retrieved publicly on the Internet.

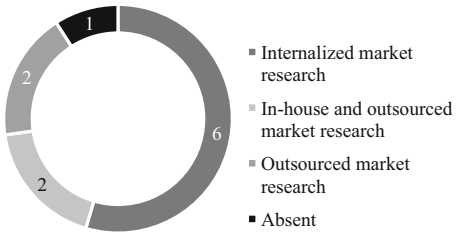

Fig. 2 Market research for localization at eleven ETC NTOs

appealing for the audience. As opposite, a standard (non-localized) description can be provided when the local marketing office does not signal a potential interest. Interviewees reported that external agencies were employed as a support too. Referring to this matter, "Interviewee_N_2" said:

> Now we do make use of localization practices. For what regards the programming […], there is an outsourced company taking care of it. In terms of content for different editions of the website, we do it ourselves. We have professionals taking care of the content […]. Indeed, we have […] offices abroad and each office is in charge of the local website.

Like the previous respondent, also this one underlines the role of local offices in determining the most appropriate content for the reference audience. However, not all organizations rely solely on their branches abroad for adaptation choices. Two of them completely outsource localization practices (i.e. including content creation) to external agencies, which work in contact with the tourism organization headquarter and its branches.

Differently from the other ten NTOs, one representative declares that only literal translation is applied across website editions—with no variations. Nevertheless, "Interviewee_N_3" admitted the shortcomings and limitations of such approach and said:

> However, for the future we would like to have a website that shows […] different experiences and products for different geographical markets. […] At the moment we have the same depth of translation for [*certain*] offers for [*certain international and domestic*] tourists. This is totally nonsense, because [*certain international tourists*] will never come to [*the destination*] for [*those activities*].[2]

The respondent also added that localization activities would require major technical changes affecting the global server for the creation of different templates.

Given the centrality that market research has for localization activities, the second part of the interview focuses on this area. More specifically, if and how specific multimedia content choices across website editions are supported by research. Results show (see Fig. 2) that six out of eleven NTOs preferably employ customer research performed by internal departments. Namely, data are retrieved directly from potential visitors or at any step of the tourism experience (i.e. before, during, or after the trip). Addressing this point, "Interviewee_N_4" declared:

[2]Words in *italics* are added by the authors to keep anonymity.

> We have a department that takes care of market research. This helps us develop strategies that guide us while choosing which content has to be present on which editions. We also have offices in the markets that tell us what content is needed for the local audience. Together with them our content team is developing specific content […].

Interviews show that social media and user generated content (UGC) help tourism specialists enhance their online communication for key markets. At this regard, "Interviewee_N_4" said:

> We also do social media research on a specific topic […] that gives us information on how the external environment perceives our destination. For instance we want to know what the main motivations to come [*here*] are. Consequently, we are elaborating market profiles for some countries […].

Interviews also reveal that four NTOs rely their market choices on data collected or produced by external entities. Namely, NTOs gather data from statistics, reports, and studies from other companies or organizations.

The third area of the interview focuses on the exploration of preferred localization activities and their coordination. Results show that four out of eleven NTOs have formalized localization practices into editorial guidelines to improve their processes. For example, those elaborated by the Norwegian tourism organization "Innovation Norway" are freely available online (editorial.visitnorway.org). They mention localization issues for areas like (i) spelling and text; and (ii) front page content. The former includes rules for units of measure, dates, and adjectives. The latter reminds local editors to give priority to the needs of their market during the year, by localizing content that fits with the local needs (Innovation Norway, 2016).

Among the preferred localization activities, adaptation of textual content appears to be the most important one (see Fig. 3). This affects especially three factors: content choice, granularity, and focus. Namely, based on the reference audience (and season), local editors decide whether to include or not a specific activity or attraction on the website. In addition to that, a certain experience (for instance) can focus on different elements according to the public or simply vary the quantity of information displayed (as declared by "Interviewee_N_1"). As part of textual content adaptation, four out of ten NTO representatives declare that VISA and travel regulations are important pieces of information that need to be adapted

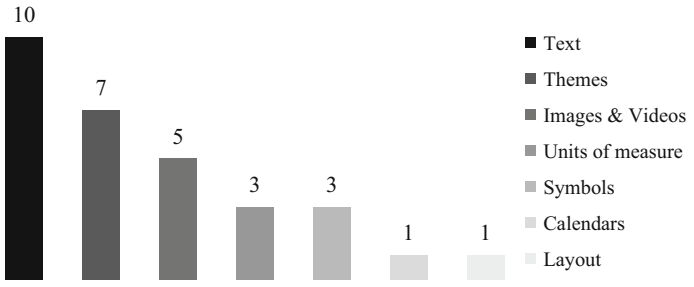

Fig. 3 Most important localization activities at eleven ETC NTOs

according to the reference audience. "Interviewee_N_2" provided an example regarding this matter:

> The practical information is more relevant to Europe for some cases, whereas for some other markets it has been adapted according to their needs. […] This is the example of Japan, India, China, and US, where practical information makes the difference. […] It is also about flight connections, exchange rates, VISA regulation, and custom regulation.

The second most important activity is the localization of destination themes. These can be defined as underlying concepts that help tourists connect experiences and services around one common denominator (Gao, Scott, & Ding, 2016). Addressing this aspect, "Interviewee_N_1" said:

> We have several projects in the markets where they take on special topics […]. Like for example the topic of heritage in the US market […]. The center of our marketing activity is based on highlighting different aspects of the destination. We have a topic-based marketing plan. We take a topic and we promote it to specific markets.

Among the localized themes, five interviewees mention tangible and intangible heritage as an important factor for destination promotion to specific international markets. Alongside with this aspect, "Interviewee_N_5" says that online content can be tailored to (i) meet positive stereotypes of the reference audience; and (ii) increase cultural familiarity. Results show that images and videos are also adapted for distinct purposes, including cultural ones. Referring to localization choices, "Interviewee_N_6" declared:

> Generally, we show content together with an image. Otherwise it is not attractive. We do not adapt images if it is not really necessary. For the Arabic market we take into account that we cannot show naked skin of women and other regulations. The aim is not to be offensive toward the specific market […].

Results reveal that the less frequent localization activities are those affecting units of measure, currency symbols, layout, and calendars.

The fourth and last part of the interview provides an overview on the presence and use of KPIs to assess the effectiveness of localization strategies. Results reveal that among those NTOs that perform adaptation activities, only four actually measure their impact on online communication. More specifically, "Interviewee_N_7" states that they have experts monitoring page views and user flow per country specific visitor. The former allows web editors to understand the popularity of an adapted webpage for users accessing the website from a specific market. Namely, if the number of viewed pages for market-tailored experiences increases, managers can infer the success and fitness of those localized contents. User flow is a metric that reports user paths through the website from the first landing page to the moment they exit it, providing data about its traffic and effectiveness. From the perspective of this study, these figures show the most popular steps (i.e. what webpages are viewed) for users from a specific country exploring a localized website edition. Starting from the homepage, for instance, the more visitors reach their goals (e.g. finding information regarding special tour offers), the more the localized content is answering their needs and preferences. On the same lines of "Interviewee_N_7", also "Interviewee_N_2"

and "Interviewee_N_8" declare that they employ web analytics metrics to understand the effectiveness of adapted contents. Moreover, the latter, who represented an external company hired to localize contents for the NTO, added:

> What we do not really do is to compare [*website's*] versions with each other. […] We share our findings rather informally during our team meetings […]. […] [*The NTO*] hires another agency to deal with their analytics accounts and big data.

With this statement, "Interviewee_N_8" introduces the option of sharing and assessing localization practices informally among all content editors. Hence, it is possible to assume that personal satisfaction of the expert in charge as well as web analytics metrics play an important role for the assessment of marketing strategies for this NTO. Providing another key perspective on the issue, "Interviewee_N_1" declares that proper localization has a direct and evident impact on SEO. More specifically, improvements for organic rankings on local search engines for relevant keywords is considered as a KPI. Indeed, increased visibility allows the website to stand out from stiff online competition. For what regards those NTOs that do not have KPIs for localization activities, two main reasons have been identified. The first refers to an explicit preference to measure the performance of the tourism website as a whole, rather than particular pieces of contents or webpages. The second involves the e-maturity of the NTOs themselves. Meant here as the level of integration of ICT into the operational practices of the company (Buhalis, 2003, p. 79). Among them, "Interviewee_N_9" declares that given the need to offer different experiences according to the public, they are actually taking important first steps for assessments by doing A/B tasting for campaigns tailored for specific markets. At this regard, "Interviewee_N_9" stated:

> One of the essentials of online marketing […] is A/B testing […]. I play a few different types of visual ads on the Internet and I am catching what is going to attract [*online visitors*] and to trigger engagement. For example, for some domestic campaigns we did not change every section. For example, […] [*we did some campaigns for a certain experience in the local language*] […] and we needed to adapt a little just that page […] [*to promote it on*] Google AdWords.

In other words, A/B testing can be a helpful research technique to examine the effect of alternative localized online ads (published on the Web) on clickthrough rate (CTR) and user engagement.

5 Conclusions, Limitations, and Further Work

As mentioned in the research goal, this paper has provided an overview of website localization practices and activities at eleven ETC NTOs. Information from open-ended interviews reveals that all content editors, IT and marketing specialists are well-aware of the importance of these processes for tourism communication. Apart from one case, all interviewees report the use of localization strategies to adapt destination websites according to the needs and preferences of specific key

publics. Such strategies are mostly based on in-house market analysis performed by internal personnel. On the same lines, research shows that outsourcing these practices can be less effective than involving staff directly (Goffin, Varnes, van der Hoven, & Koners, 2012).

From a theoretical point of view, this paper contributes on two points. First, it provides an overview on the way the concept of localization is perceived by the tourism supply on the following areas: (i) current state of localization processes; (ii) market research for online content creation and selection; (iii) most important adaptation activities; and (iv) use of key performance indicators (KPIs) to assess the effectiveness of marketing and communication ad hoc choices. Second, it depicts the concept of localization as a process rather than a punctual activity. On the one side, this implies that adaptation activities are not meant to suppress the novelty of the destination in favor of complete familiarity (Tigre Moura et al., 2014). Instead, they aim at making sustainable (i.e. understandable) only certain aspects of the website (e.g. content selection), while maintaining intact the novelty of the tourist experience. On the other side, the process of localization implies the possibility of coexistence with a globalized communication approach in the tourism field. Literature defines this as a "glocalized" strategy, which shows a balance of characteristics belonging to both approaches (Matusitz, 2010).

This paper presents also three managerial implications. First, interviews with eleven ETC NTOs show that localization activities can be employed to enhance online contents for specific publics. The selection of ad hoc activities avoids the risk of information overload (i.e. an exaggerated number of alternatives and number of attributes), together with its negative effects on destination image (Rodríguez-Molina, Frías-Jamilena, & Castañeda-García, 2015). Second, interviews show that localization can be used not only for marketing purposes, but also to convey sustainable information about culturally sensitive topics like local heritage. Third, results show that the effects of localization activities can be measured by examining (i) web analytics metrics (i.e. user flow and page views); and (ii) search engine positioning among organic results. In addition to these, there is also the possibility of (iii) performing A/B testing online to measure the effect of alternative localized ads (published on the Web) on clickthrough rate (CTR) and user engagement; and (iv) holding meetings among content editors to share and assess localization practices informally.

The study is not exempt from limitations. While ETC gathers 32 members, the overview on localization activities regards only 11 of them. Hence, its results cannot be generalized to those who have not participated. Future research will include other NTOs outside the European area and DMOs of different sizes (i.e. not only those at the national level). Finally, it will be necessary to conduct research on further indicators for localization activities such as costs and quality control.

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Researching Individual Satisfaction with Group Decisions in Tourism: Experimental Evidence

Amra Delic, Julia Neidhardt, Laurens Rook, Hannes Werthner and Markus Zanker

Abstract The goal of the present study was to investigate how satisfied individuals are with the final outcome of a group decision-making process on a joint travel destination. Using an experimental paradigm (N_{total} = 200, N_{groups} = 55) it was obvious to hypothesize that individuals would especially be satisfied with the final group decision when it matched their own initial travel preference and that they would be dissatisfied in case it mismatched their initial preference. However, in addition the influence of personality and group dynamics differences (Thomas-Kilmann Conflict Mode Instrument, Five Factor Model) as well as travel types of the individual decision maker on the satisfaction level with the group decision outcome as the dependent variable were further researched. The paper concludes with implications for e-tourism, especially with regards to the development of interactive tools for group travel.

Keywords Group decision making · Recommending to groups · Personality · Traveller types

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1 Introduction

What is it that determines the level of satisfaction of an individual group member with the final group decision about a joint travel destination? In the present research, it is claimed that the answer to this question lies in the extent to which the final group verdict matches (or mismatches) the individual's initial travel preferences. Inspired by behavioural research on group decision-making involving preferences (De Dreu & Weinhart, 2003; Kerr & Tindale, 2004), four theoretical outcomes of tourism-related group decision-making are explored:

First, it would make sense for a group member to experience sensation of winning, if someone's favourite—or second favourite—destination from a larger list of potential destinations made it as the final group choice. This would render that group member a '*satisfied winner*'—i.e., pleased with the travel destination that was mutually agreed upon and happened to match the own initial preference. Contrasting this, the group member would probably experience sensation of losing, if the rest of the group collectively rejected his or her favourite travel destination, and, instead, opted for some other travel destination. This could turn that group member into a '*dissatisfied loser*', not pleased with the mismatch between private and group preference. Less straightforward, someone may have the same preference as most of the group, but not derive satisfaction out of it. This group member would be a '*dissatisfied winner*'—dispassionate with the, perhaps boring, travel destination. Finally, it makes sense to also consider the possibility of a '*satisfied loser*'—someone, who failed to convince the other members of the group of his/her favourite destination (or did not even bother), but is nevertheless happy with the end result—perhaps, because each destination was equally (un)attractive or (ir) relevant, and only triggered 'choice deferral' (White et al., 2011).

In addition, we hypothesized that the likelihood of a person being satisfied after the tourism-related decision making process also depends on trait-specific characteristics. It is specifically explored that the satisfaction level of the individual group member with the final group decision is under the influence of personality differences (Five Factor Model), the individual's general inclination towards competitive-collaborative interaction with other people (Thomas-Kilmann Conflict Mode Instrument), and the individual's higher or lower general interest in particular tourism-related activities (i.e., travel types).

The remainder of this paper will discuss the theoretical underpinnings of group decision-making, as well as the personality, group dynamics-related characteristics and travel-related attitudes (i.e., travel types)—respective determinants of satisfaction with group decisions in tourism—in greater detail (Sect. 2), introduce the experimental design conducted (Sect. 3), as well as report and discuss the results related to e-tourism (Sects. 4, 5 and 6).

2 Background

Behavioural research on group decision-making maintains that individuals often arrive at group decisions that are satisfactory for most group members (Gorman, 2014; see DeChurch & Mesmer-Magnus, 2010, for a review). Often observed in that respect is a process, in which the individual preferences within a decision-making group lead to consensus via social 'sharedness'—that is, the option that is most commonly shared within the group will become the final group decision. This situation is often referred to as a majority/plurality-wins model, which nicely captures why many group members are typically satisfied with decisions made in a group setting (Kerr & Tindale, 2004). The shared consensus choice is the response option that matches most of the individual group members' personal preference, causing high satisfaction levels within the group.

On the other hand, members of a group decision-making can also fall victim to dissatisfaction (see De Dreu & Weinhart, 2003, for a review). Well-documented in that respect is the dissatisfaction that the most extreme participants in group decision-making experience, when their private preference does not make it as the final group decision. The least central member within the group, indeed, often loses out against the majority/plurality, and is forced to comply with a mismatching decision, which leads to feelings of dissatisfaction (Kerr & Tinale, 2004). Anecdotal evidence exists even for the so-called 'Abilene paradox', an extreme situation, in which group members collectively arrive at a joint decision that is dissatisfactory to most (if not all) individuals within the group (Harvey, 1988; see also Forsyth, 2014).

It makes sense to assume that the likelihood that the person will experience (dis)satisfaction with the outcome of the decision-making process also depends on trait-specific characteristics of the individual group member. In the next section, the five-factor model of personality, the Thomas-Kilmann Conflict Mode Instrument and the captured travel types will be discussed.

2.1 Determinants of Satisfaction with Group Decisions

The Big Five. One of the most widely used personality theories is the five-factor model of personality, also known as the Big Five (McCrae & Costa, 1987). This model assumes that personality can be broken down into five dimensions: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. The Openness dimension measures the extent to which someone is more or less inclined towards experiencing new and unusual things (or is rather into conventional and conservative things). Conscientiousness taps into the extent to which someone is precise, careful and reliable (or rather sloppy, careless, and undependable). Extraversion measures the extent to which people are outgoing, cheerful, warm (or rather quiet, timid, and withdrawn). Agreeableness refers to the extent to which

someone is altruistic, caring, and emotionally supportive (or rather indifferent, self-centred or hostile). Neuroticism, finally, measures the extent to which someone experiences distress (or rather is calm and even-tempered; cf., McCrae & John, 1992). The five-factor model of personality has been converted in many bigger and smaller measures (Donnellan et al., 2006), and is used in a wide range of application domains, including tourism (Wood & Bell, 2008).

Thomas-Kilmann Conflict Mode Instrument. When individuals engage in decision-making in group setting, conflict is bound to arise (Forsyth, 2014). Even though conflict in smaller portions can positively contribute to team functioning (De Dreu & Van de Vliert, 1997), much research exists showing that conflict typically ruins performance and satisfaction levels in teams (De Dreu & Weingart, 2003). The Thomas-Kilmann Conflict Mode Instrument was developed to address the potential conflict resolution styles group members adopt when necessary. By distinguishing between high and low cooperation and high and low assertion, 'competing', 'collaborating', 'avoiding' and 'accommodating & compromising' were identified as possible conflict resolution styles (Thomas & Kilmann, 2010). Prior studies have connected these four styles with the five-factor model of personality (Wood & Bell, 2008).

Travel types. There is an important line of research in the tourism domain that is concerned with the relationship between individual characteristics, psychological needs and personal expectations on the one hand, and travel-related attitudes on the other. A well-established classification of tourist preferences is constituted by the framework introduced in (Gibson & Yiannakis, 2002), which distinguishes, as authors named them, 17 Tourist Roles. Even though these Tourist Roles represent short-term behaviour relative to the long-term Big Five preferences, evidence exists for associations between these two constructs (Delic et al., 2016). Factor analyses on the 17 Tourist Roles and the Big Five yielded seven basic travel types, i.e., Sun and Chill-out, Knowledge and Travel, Independence and History, Culture and Indulgence, Social and Sport, Action and Fun and Nature and Recreation (Neidhardt et al., 2014).

3 Method

3.1 Research Objective

The general objective of this research was to examine the satisfaction levels of groups of individuals in a travel-related group-decision making task. Understanding the dynamics underlying such processes is highly relevant for the design and the development of e-tourism recommender systems (Werthner et al., 2015). A detailed description of the motivation, experimental design, the implementations and the collected data of this research project is presented in Delic et al. (2016a). The results of an initial analysis of a subset of the data showed that conflicting initial

preferences of individual group members do not substantially affect the satisfaction of a participant with the group decision outcome. The results of this first analysis are presented in Delic et al. (2016b). The work presented here is now based on *additional experiments* conducted since the writing of Delic et al. (2016b). Thus, the effects that personality differences (the Five Factor Model or Big Five), inclinations towards dealing with group dynamics (Thomas-Kilmann Conflict Mode Instrument), as well as travel types exert on the satisfaction levels of the individual participants with the group decision outcome will be further explored. In this section the experimental study will be described in more detail and the measures used will be introduced.

3.2 Participants and Design

The sample for this research consisted of 200 participants, who decided on a joint travel destination in 55 groups (7 groups with 2 members; 14 groups with 3 members, 26 groups with 4 members; 8 groups with 5 members). The study was initiated within the International Federation for Information Technologies in Travel and Tourism (IFITT) by 11 universities worldwide. The first implementations of the study took place at the TU Delft and University of Leiden (in the Netherlands), and at the Alpen-Adria-Universitaet Klagenfurt and TU Wien (in Austria) from November 2015 to April 2016.

3.3 Procedure

This research was executed in three stages. In the first stage, participants were invited to fill out an online (pre)questionnaire that tapped into individual characteristics (the Big Five), travel preferences (the 17 Tourist Roles) and basic demographics. Furthermore, the participants were asked to rank the attractiveness of ten predefined travel destinations on a five point Likert-scale. The destinations were: Amsterdam (for Austrian participants only), Berlin, Copenhagen, Helsinki, Lisbon, London, Paris, Rome, Stockholm, and Vienna (for Dutch participants only). In the second phase, the *actual group meetings* took place. In class, the participants were divided into groups of two, three, four or five, and physically seated on a desk as such. Each group received the task to choose two travel destinations (i.e., the first and the second choice) out of the ten previously and individually rated destinations that they would like to visit together as a group. That is, participants had to reach agreement, which two of the ten European cities would make it as the commonly agreed travel destinations for the group. After this face-to-face group decision-making exercise, the participants filled out an online (post)questionnaire, where they had to indicate the first and second group travel destination choice, as well as their satisfaction with the actual group decision. This final questionnaire

also assessed the individual identification participants experienced with the group, and the perceived difficulty of the group decision-making process. Furthermore, the task in general had to be assessed. For most of the questions, a five point Likert-scale was used.

3.4 Measures

High and Low Choice Satisfaction. In the online (post)questionnaire, the individual group member's level of satisfaction with the final group decision was assessed on a five point Likert-scale. A participant was considered to be highly satisfied with this group decision, if his or her answer was higher than or equal to the median and was considered to be unsatisfied with the group decision, if the answer was lower than the median (see Table 1).

Winners and Losers. To assess whether the individual group member was a winner or a loser in the group decision-making process, the actual match or mismatch between the favourite travel destination(s) as submitted by the individual prior to the group meeting, and the travel destination that was submitted by the group after that group meeting was considered. That is, a participant's private ranking of the ten destinations in the (pre)questionnaire was compared with the first and second group choice as reported in the (post)questionnaire. The strength of this match/mismatch between individual and group preference was measured with the help of Kendall tau distance—i.e., a distance function for ranking lists with the property that more similar rankings have a smaller distance. A group member with a distance lower than the median Kendall tau distance was considered a winner, or a loser otherwise (see Table 2).

The Big Five. As described in Sect. 2, many bigger and smaller measures have been developed to measure the five-factor model of personality. For the present study, the 20 questions from the International Personality Item Pool—Five Factor Measures that were validated in (Donnellan et al., 2006) were administered. These so-called Mini-IPIP Scales provided us with psychometrically approved measures for the respective Openness, Conscientiousness, Extraversion, Agreeableness as well as Neuroticism profiles of each participant in the study.

Thomas-Kilmann Conflict Mode Instrument. Following the literature (Wood & Bell, 2008), it was possible to derive the participants' individual conflict resolution

Table 1 Descriptive statistics of reported satisfaction

Satisfaction statistics	# of high satisfied	# of low satisfied
Min: 1 Median: 10 Average: 10.24 Max: 14	124 (# of = median: 33)	76

Table 2 Descriptive statistics of the calculated Kendall tau distance

Kendall tau distance statistics	# of winners	# of losers
Min: 0 Median: 5 Average: 5.35 Max: 16	99	101

styles from their Big Five scores. According to Wood and Bell's procedure, someone with a high score on Agreeableness (i.e., higher than the median Agreeableness score (3.75) in the sample) and with a high score on Extraversion (i.e., higher than the median Extraversion score (3.50) in the sample) can be considered as Collaborating ($N = 45$); a person with a low score on Agreeableness and a low score on Extraversion can be called Avoiding ($N = 72$); a person with a high score on Agreeableness and a low score on Extraversion can be regarded as Accommodating ($N = 48$); and, finally, a person with a low score on Agreeableness, but a high score on Extraversion can be considered as Competing ($N = 35$).

Travel Types. The (pre)questionnaire assessed the participants' individual Tourist Roles as defined by (Gibson & Yiannakis, 2002). Together with his or her Big Five scores, the Tourist Roles of each of the participants were used to infer their individual scores for each of the seven basic travel types (see Sect. 2).

4 Results

To answer the research question what determines the satisfaction-levels of individual group members on a joint travel destination, the association between reported satisfaction of an individual group member, and the match or mismatch between the initial travel preference of this individual and the final group decision as operationalized in the Kendall tau distance (described in the previous section) were explored first. Analysis revealed that the choice satisfaction of the individual was significantly and negatively correlated with the Kendall tau distance (−0.35, p-value < 0.001). This indicated that the individual group member's satisfaction with the final group decision was lower when the initial preferences more strongly deviated from the group choice. This finding was in line with our prediction.

Next, the differences between highly satisfied versus unsatisfied participants in relation with individual group member's characteristics (i.e., Big Five Factors and seven travel types; for details see methodological Sect. 3) were analysed. A t-test revealed that highly satisfied participants were more precise/reliable, agreeable and less neurotic than unsatisfied participants. Also, they scored higher on *Social & Sport* and *Action & Fun* travel types. These results were expected, as both travel

Table 3 Significant differences between high and low satisfied participants

Variable	Low satisfied (76)	High satisfied (124)	*p*-value
Conscientiousness	3.651	3.836	0.027
Agreeableness	3.628	3.844	0.013
Neuroticism	2.743	2.423	0.001
Social & sport	2.698	2.973	0.018
Action & fun	2.038	2.318	0.033
Kendall tau distance	6.578	4.596	0.000
Thomas-Kilmann Mode	2.684	2.362	0.026

types were strongly related with the ten European city destinations that could be chosen. This might explain, moreover, why participants who already liked that type of destinations were more satisfied in general. Furthermore, the *social* of the *Social & Sport* travel type fit in the context of group travel. The Thomas-Kilmann Conflict Mode Instrument indicated that participants with a more collaborative personality were generally more satisfied with the group decision (i.e., lower value of the Thomas-Kilmann Mode variable indicates more collaborative behaviour). Finally, highly satisfied participants perceived the group decision process as easier, the group similarity as higher, and their identification with the rest of the group as stronger (see Table 3).

Next, and given that the correlation coefficient between satisfaction and Kendall tau distance was moderate in magnitude, the losers of the group tourism interaction were studied to explore the differences between satisfied and unsatisfied losers (for details see methodological Sect. 3). Among those participants that lost negotiations with their group members, and thus had to accept a mismatching travel destination, conscientiousness (the extent to which someone is precise/reliable) no longer had a significant impact. Only participants high on positive Big Five factors (thus those being inclined towards experiencing unusual things, being social, outgoing, and altruistic) or low on neuroticism still derived satisfaction from their interaction with the group—but only because of their socially inclined dispositions. With regard to travel types, the losers did not appreciate *Action & Fun* anymore, as before, but only *Social & Sport* (see Table 4). This finding was consistent with the direction suggested in the Big Five factors, in the sense that it suggested that only those losing participants with a stronger social orientation were capable of maintaining a sense of satisfaction with the final group decision despite their loss. These outcomes are consistent with general theorizing on the five-factor model of personality and tourist roles (Donnellan et al., 2006; McCrae & Costa, 1987; McCrae & John, 1992; Wood & Bell, 2008).

Finally, it was explored in what way individual differences in conflict resolution style impacted the satisfaction-levels of the respective winners and losers in the group meetings. Previous research suggested that conflict resolution styles not only are related to the self-reported satisfaction of the individual member of a group, but, as such, also exert an influence on the actual outcome (i.e., the final choice) of the decision-making process in a group (Forsyth, 2014). To explore this possibility, the

Table 4 Significant differences between high satisfied and low satisfied losers

Variable	Low satisfied (48)	High satisfied (53)	*p*-value
Openness	3.73	3.971	0.013
Extroversion	3.197	3.566	0.014
Agreeableness	3.651	3.882	0.048
Neuroticism	2.651	2.325	0.011
Social & sport	2.616	3.119	0.001

Table 5 Contingency table: Thomas-Kilmann conflict resolution styles and outcome

Thomas-Kilmann mode/outcome	Collaborating	Accommodating	Avoiding	Competing	Sum
High sat. winners	20	17	22	12	71
High sat. losers	14	15	15	9	53
Low sat. winners	6	5	11	6	28
Low sat. losers	5	11	24	8	48
Sum	45	48	72	35	200

individual "winners versus losers" in the group decision-making process, and their potential "high versus low satisfaction level" were juxtaposed with the final outcome to arrive at: (1) high satisfied winners, (2) high satisfied losers, (3) low satisfied winners, and (4) low satisfied losers. Next a contingency table was created to understand the relations between the four respective Thomas-Kilmann conflict resolution styles and our four possible outcomes (see Table 5).

Table 5 nicely shows that those individuals who actively dealt with the potential conflict arising from different preferences within the group regarding the final travel destination in a cooperative fashion (i.e., by engaging in a collaborative or accommodating resolution style) often became highly satisfied winners. Given their active cooperation with the other members of the group (which can be understood in terms of "teamwork"; Forsyth, 2014), they also often were highly satisfied when they lost in the end. Obviously, the latter pattern was not observed for individuals with a competing conflict resolution style, who only were satisfied when they won —that is, if they managed to do so in the first place.

From Table 5, it also becomes evident that matters were more complicated for so-called avoiders—i.e., those participants who took a more passive role in the group negotiations. On the one hand, their avoiding conflict resolution style paid off in terms of satisfaction levels when they were among the winners. On the other hand, however, they fell particularly hard into low satisfaction when they lost. Clearly, the share of low satisfied losers exceeded the expected value based on the overall distribution—an effect that is even more pronounced when aggregated for all categories (Chi-square = 5.373, $df = 1$, $p = 0.02$; see Table 6).

This seems to suggest that individual group members who play an active role in group negotiations in terms of conflict resolution style are less likely to be dissatisfied losers as opposed to those qualified as avoiders according to the

Table 6 Contingency table: Aggregated Thomas-Kilmann styles and outcome

Thomas-Kilmann/outcome	Avoiding	Not avoiding	Sum
Other outcome categories	48	104	152
Low sat. losers	24	24	48
Sum	72	128	200

Thomas-Kilmann Conflict Mode Instrument. The implications for e-tourism, especially in regard of the development of interactive tools for group travel, will be discussed in the next section, in conjunction with the other findings of this study.

5 Discussion and Implications

The present study was set up to explore the satisfaction levels of individual group members with the final group decision about a joint travel destination. The obvious assumption was confirmed, i.e., individual group members were highly satisfied with the outcome of group negotiations when the final group decision matched their own initial preferences. The theoretical perspective of the five-factor model of personality (The Big Five) and travel types was taken to explore differences in satisfaction levels, and two contributions stand out.

First, the results showed that highly satisfied participants overall were more precise/reliable, agreeable and less neurotic than unsatisfied participants. An important additional insight was that group members, when they lost their position to a different group travel decision, nevertheless maintained a sense of satisfaction when they were blessed with a positive personality profile (i.e., more open towards unusual experiences and in favour of cooperation). This finding is consistent with theorizing on the five-factor model of personality (Donnellan et al., 2006; McCrae & Costa, 1987; McCrae & John, 1992), but especially also confirms a large portion of behavioural research into social dilemmas that emphasizes the distinct responses of individuals with a more cooperative (prosocial rather than competitive) orientation towards group members in face of disagreement (Van Lange, 1999; Van Lange, Balliet, Parks, & Van Vugt, 2014). A similar response pattern was found for travel types that in general reflected the type of travel destination (i.e., European cities) participants were provided with. But more interestingly, the travel type that was rendered most salient in face of disagreement and potential loss was *Social & Sport* —a role that taps into cooperation with other tourists (Gibson & Yiannakis, 2002; Wood & Bell, 2008). In other words, the personality and attitudinal effects that were observed in the present study on satisfaction levels consistently emphasize the need to account for a prosocial value orientation in individual group members engaged in the collective task to decide on a joint travel destination for tourism.

Second, the results showed a major difference in experienced satisfaction with the final travel destination submitted by the group for individuals as a function of their

active (not avoiding) or passive (avoiding) position during the group negotiations. Passive players were highly satisfied with the final travel destination when it matched their own initial preference, but were extremely dissatisfied with the collectively chosen travel destination in case of a mismatch with their initially disclosed preferences. Furthermore, with exploratory analysis it turned out that 17 of 22 (highly satisfied winners) avoiders were in highly homogeneous groups with respect to their destination preferences, while 19 of 24 (low satisfied losers) avoiders were in highly heterogeneous groups with respect to their destination preferences.

The analysis presented in the paper was ultimately motivated by the goal of building more effective e-tourism group recommender systems. Recommender systems, in general, help users to find content of interest and in the e-tourism domain a recommender system can suggest, for instance, destinations, hotels, POIs, tours, etc. (Felfernig et al., 2007). A group recommender system deals with a group of people instead with individual users and this problem is very often related to the tourism recommender systems (Masthoff, 2015; Felfernig et al., 2007). Therefore, the system should better recommend which items the group is interested in, and ensure a certain level of satisfaction for each group member.

Recommender systems require the design of ranking functions to emphasize the items of higher presumed relevance for a particular user. In group recommender systems, these ranking functions rely upon aggregation functions (i.e., group preferences are a result of aggregated individual preferences). Due to Arrow's theorem and current findings of the group recommender systems research (Masthoff, 2015) a single best aggregation strategy does not exist. The results of the present study can be used to personalize the aggregation functions to the contextual conditions of groups. For example, our results indicate that the personality and travel attitude of group members influence their satisfaction with the final group decision; it follows that in a next step one could assign importance weights of group members depending on their individual characteristics captured by the user model. Specifically, a picture-based recommender system (Neidhardt et al., 2014, 2015) leans upon the same set of dimensions as the (pre)questionnaire of the study (i.e., Big Five Factors and 17 Tourist Roles). Moreover, each user is modelled as a mixture of the seven basic travel types that are used in the study analysis. The obtained insights, in other words, allow generalization of the picture-based approach to a group recommender system (Delic, 2016). A second concrete case that can benefit from the current findings is a mobile system named STSGroup (Nguyen & Ricci, 2016)—a group recommender system that allows group members to engage in discussion with each other, and to propose and give feedback on items proposed by the other members of the group. The system monitors interactions and discussions so as to navigate the group, and produce further recommendations. Based on the present work, it stands to reason special care should be taken in such a system to engage also the group members with avoiding personality types.

Finally, no study is without limitations. In the case of our research, even though the data was gathered from many participants working on a group tourism assignment in a real-time setting with face-to-face decision-making groups, it should be acknowledged that the presented results remain on the individual level.

Admittedly, this is a weakness of many studies that use personality measurements, but it would make sense to also explore the impact of the personality and attitudinal measures discussed in the present study on an aggregated group level. Thus, in our future work, a multilevel analysis (Kozlowski & Klein, 2000) will be conducted. Arguably, the individual group members were highly influenced by each other, and it follows that the satisfaction levels for each of the individual participants should also to some extent have been under the influence of group dynamics. Moreover, the participants did not have an actual travel experience. Even though a real world scenario was presented to the participants, the absence of the actual travel experience might have affected the behavioural style of the participants.

6 Conclusions

The present study aimed to answer how satisfied individuals are with the final outcome of a group decision-making process on a joint travel destination. Using an experimental paradigm with group members interacting with each other in real-time and in a face-to-face manner, it was found that group members were particularly satisfied with the outcome of group negotiations when the final group decision matched their own initial preferences. Satisfaction levels of group members were generally influenced by their respective Big Five characteristics and travel types in ways that were consistent with extant theorizing. However, our study also made clear that a big difference in experienced satisfaction existed when the individual had taken an active (not avoiding) or passive (avoiding) position during the group negotiations. Especially passive players experienced dissatisfaction with the travel destination that was collectively chosen. This finding has major repercussions for the development of interactive tools for group travel, because it highlights the importance of actively engaging users in such tools aiming at supporting the decision-making process—even if the natural disposition of such users is to avoid group discussion. If such tools are successful in engaging these types of users, chances are that they, too, will become highly satisfied users of e-tourism products for group travel.

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Part II
E-strategy and ICT for Innovation

From Floating to Leading: The Transformation of Digital Marketing Capabilities Through ICT Uptake in Tourism SMEs

Kirsi Meriläinen

Abstract This study focuses on the digital marketing capabilities of tourism SMEs. The study addresses the question of how the use of ICT-based tools benefit the organisational capabilities of a company. By adopting marketing as a set-of-skills approach, the study provides new insights into the existing tourism literature on e-marketing. By uncovering the transformative nature of digital marketing capabilities, a review of the literature on e-marketing in tourism and digital marketing capabilities was conducted, as was a multiple case study of tourism SMEs. Initial findings indicate that the digital marketing capabilities of companies are transformed through ICT-based uptake. Four major capabilities were identified, each of which evolves as a result of using the tools. A key finding of the study is that the use of ICT-based tools transforms digital marketing capabilities from a set of abilities that enables tourism SMEs not only to float in a web-marketing stream, but also to lead such a stream.

Keywords ICT use · e-marketing · Digital marketing capability · Tourism SMEs · Case study

1 Introduction

Properly using ICT is a matter of survival for companies operating in the digital era. The technological environment continuously offers new web-based solutions and tools to companies for the purpose of advancing marketing activities. Such solutions and tools are also increasingly available for SMEs because their uptake requires minimal financial investment, if any. However, this then results in new requirements concerning organisational capabilities. Consequently, the former dilemma of whether 'to use or not to use ICT' in tourism SMEs is now becoming

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more about how to develop organisational marketing capabilities through the use of ICT tools to ensure the competitiveness of a company.

The role of ICT in tourism marketing has been extensively discussed in tourism literature. Not surprisingly, several research articles reviewing the state of the art of e-marketing have been published (e.g., Ip et al., 2011; Law et al., 2014). Based on the reviews, the research on e-marketing in tourism focuses mainly on antecedents and consequences of e-marketing. Particularly, website marketing is emphasised.

While useful, most of the existing studies adopt a 'marketing as a function of business' approach to tourism e-marketing, which does not adequately acknowledge the broad scope of marketing theory. Further, the research focuses to a large extent on big companies, such as hotels. What seems to be largely overlooked in e-marketing tourism research is the 'marketing as a set of skills' approach (see Achrol & Kotler, 1999) in the SME context. This is the case despite a growing tendency in the turbulent business world to also continuously improve digital marketing capabilities in tourism SMEs, even when the types of capabilities required are largely unknown in such a rapidly developing market. Therefore, this study focuses on the digital marketing capabilities of tourism SMEs.

The purpose of the study is to describe the influence of ICT use on digital marketing capabilities in a tourism SME setting. The study stresses the transformation of the organisational capabilities as a result of ICT uptake. The study initially assumes that an organisation can learn and that it learns partly through experiences. Two research questions are posed to reach the target. First, how does the use of ICT-based tools affect organisational capabilities? Second, what kinds of consequences do the influences have on marketing activities within a company? The answers to these questions will shed light on the dimensions of digital marketing capabilities in tourism literature, and how the digital marketing capabilities of SMEs can be increased in real life.

The paper builds primarily on literature on e-marketing in tourism. Particularly, the most recent comprehensive review articles on the applications and the development of information and communication technologies in hospitality and tourism are utilised for the purpose of uncovering the current state of art on digital marketing capabilities and related studies in tourism. Apart from the tourism literature, studies on digital marketing capabilities anchored in the marketing literature are also used.

Acknowledging the extensive ongoing discussion on the nature of tourism e-marketing, this study adopts the concept of e-marketing when referring to the use of ICT in marketing. Further, the concept of capability is used when discussing a set of organisational skills while simultaneously recognising numerous studies that have adopted related concepts. By using the literature as a source of inspiration and combining insights with the case study, an analytical description of the influence of ICT uptake can be provided, and hence, this study will make a significant contribution to the existing literature on e-marketing in tourism. Additionally, the study also has practical relevance, since the results can be used in tourism SMEs for planning and implementing efforts at improving their digital marketing capabilities.

The paper begins with a discussion of e-marketing in tourism and the capabilities that exist in e-marketing. Second, the research methodology and the empirical inquiry are presented. Thereafter, the empirical evidence is outlined. The study ends with a discussion of the conclusions and the implications both for managers and researchers.

2 Literature Review

2.1 e-Marketing in Tourism Studies

Ip et al. (2011) identify seven dimensions on development of information and communication technologies in hospitality from a supplier's perspective. Law et al. (2014) adopt a similar approach and examine the use of ICT by hospitality and tourism suppliers along the same seven dimensions. One of the dimensions in the reviews is marketing, which further falls in their review into two major categories: e-marketing strategies and web-based relationship marketing.

The aforementioned tourism scholars have identified several topics, which have been positioned under the heading of e-marketing strategies. Literature on *e-marketing strategies* is dominated by the effectiveness of different e-marketing strategies. This line of research focuses on the content of destination websites with respect to marketing effectiveness; the services provided on websites; and the relationship between website strategies and hotel size. In addition, the consequences of effective website marketing strategy have been investigated. For example, studies on the effectiveness of e-marketing on the dominance of tourism in a destination, and on the relationship between information search using websites and destination images are available. Further, the studies highlight that the small and medium-sized hotels, when their own hotel websites are established, need to ensure the visibility of their websites in search engines.

In addition to websites, the literature on e-marketing strategies concerns social media and its effectiveness. The studies show that social media usage among DMOs is still largely experimental and strategies vary significantly. It has been suggested that a comprehensive marketing framework is required to enable DMOs to take advantage of the new tools and capitalise on social media marketing strategies. Furthermore, there is a wide array of studies on the relationship of UGC and eWOM on a company's business. Search engine marketing (SEM) has also been discussed in recent studies, which suggest that managers can analyse the keywords used in online search engines when developing their marketing strategy.

The research on *web-based relationship marketing* emphasises the role of the internet in increasing customer base and in serving as an innovative communication channel; an adoption of ICTs for online relationship marketing and electronic customer services; and an evaluation of electronic relationship marketing characteristics on hospitality and tourism websites. The studies within this domain show a limited use of internet among the bed-and-breakfast hotel owners when developing

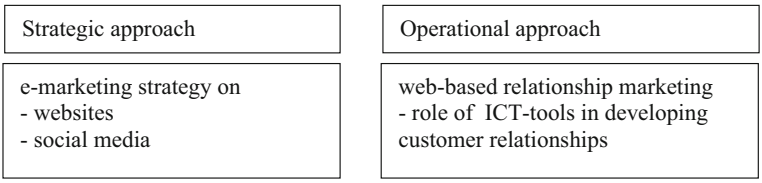

Fig. 1 Approaches to e-marketing in tourism studies

long-term relationships with their customers as well as neglected potential of direct contact in relationship formation with customers through websites in small and medium-sized hotels. The discussion of e-marketing in tourism is depicted in Fig. 1.

The preceding discussion shows that there is an emerging rich debate on ICT adoption in the tourism business. The studies on e-marketing focus mainly on e-marketing strategies and web-based relationship marketing. The most discussed topic is website marketing (see also Law et al., 2014). By taking a broader look at the literature, the debate on e-marketing strategy implies a strategic approach to e-marketing, and the web-based relationship marketing implies the operational approach. Further, the discussion indicates that the e-marketing studies in tourism research typically adopt 'the business as function' approach to marketing instead of'the marketing as a set of skills' approach, and the subsequent discussion on capabilities in marketing research in general.

What seems to be missing, however, is the research on capabilities of e-marketing. Only a few exceptional single studies on e-marketing and capabilities can be found. Mistillis et al. (2014) focuses on eDestination marketing and addresses that SMEs' online capability in terms of technology use is required for enhancing the digital customer journey in destination marketing.

The dearth of studies on e-marketing capabilities is surprising given that the tourism research on e-Strategic management and ICT adoption has increasingly highlighted the issues. The studies on the role of organisational capabilities on ICT adoption have emerged. For example, Yuan et al. (2003) have examined the role of an organisation's capabilities in determining the readiness of tourism businesses to embrace ICT, and the relationship between organisational capabilities and IT implementation effects (Yuan et al., 2006). Further, El-Gohary (2012) shows that the matter of the owner's skills is an important internal factor that affects the use of electronic marketing by small firms. Law et al. (2014) stress the full utilisation of enabling capabilities of ICT in the tourism business.

Recently, Reino, Frew, and Mitsche (2014), by adopting the term 'eTourism capability' have focused on measuring the level of ICT penetration and on assessing the level of contribution that ICT makes to the performance of an organisation or a destination (Reino et al., 2014). Studies on assessing the level of the contribution of ICT to the organisational performance have also emerged (for a review, see Reino et al., 2014).

The following discussion turns to the digital marketing capabilities as they appear in a selected overview of marketing theory.

2.2 Dimensions of Digital Marketing Capabilities

The most notable discussion on digital marketing capabilities is the model proposed by Chaffey (2010). By applying an organisational capability maturity model, which is an established method for assessing the development of the digital capabilities of an organisation (Uhl, Born, Koschmider, & Janasz, 2014), a maturity or stage model of digital marketing capabilities for assessing digital marketing activities was created. The model indicates the transformation of each digital-marketing capability.

The model covers six different digital marketing capabilities: digital channel strategy, online customer acquisition, online customer conversion and customer experience, customer development and growth, cross-channel integration and brand development, and digital channel governance, including change management.

The capability of an organisation for developing digital channel strategy follows, to large extent, the process of traditional strategy development. Two specific issues of digital strategies underline an understanding of customer behaviour within their customer journey within the online marketplace and an interaction with other channels. Particularly, the role of search engines and search terms are highlighted.

Five other areas of the model represent the tactical aspects of e-marketing and therefore, together form digital strategy. The dimensions of acquiring customers online, conversion and experience and customer development and growth form the core part of the strategy that are its distinct areas, all of which can be managed by the external agencies.

Online customer acquisition typically refers to the use of the website to acquire new customers for a company, when lead customers can be converted into sales. In order to acquire customers, companies use different digital communication tools or channels such as search engine marketing, social media marketing, online partnership, interactive advertising, opt-in e-mail marketing and WOM. Online customer conversion and customer experience are important for effective website marketing. A balanced experience for site visitors is influenced by many factors such as content, layout and visual design. Particularly, the key issues of experiences that apply across sites are emphasised. The dimension of customer development and growth refers to attracting returning visitors to websites. Social media are regarded as an important factor to companies for customer retention and growth. E-marketing techniques are also emphasised.

The dimensions of cross-channel integration and brand development, as well as digital channel governance are an integrative part of the digital strategy and operations in organisations. Cross-channel integration is important for external integration in a customer's journey. However, the integration requires a careful coordination to occur. As Chaffey (2010) suggests, outbound communication can be made more effective by tailoring the message based on tracking customer interactions. Finally, digital-channel governance refers to the overall management of resources, i.e., staff resources, financial resources and infrastructure, for e-marketing within an organisation. The digital marketing capabilities, divided into the strategic and tactical categories, are summarised in Fig. 2.

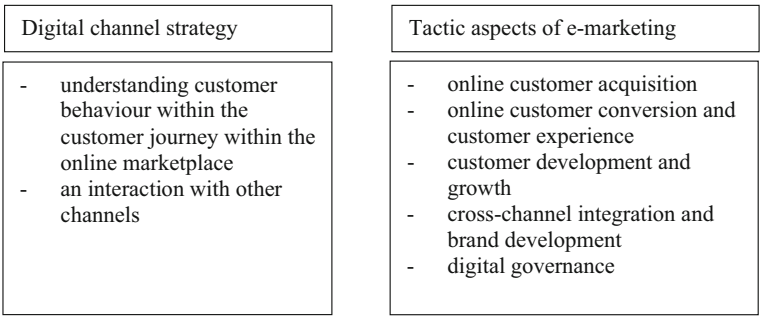

Fig. 2 E-marketing activities (Chaffey, 2010)

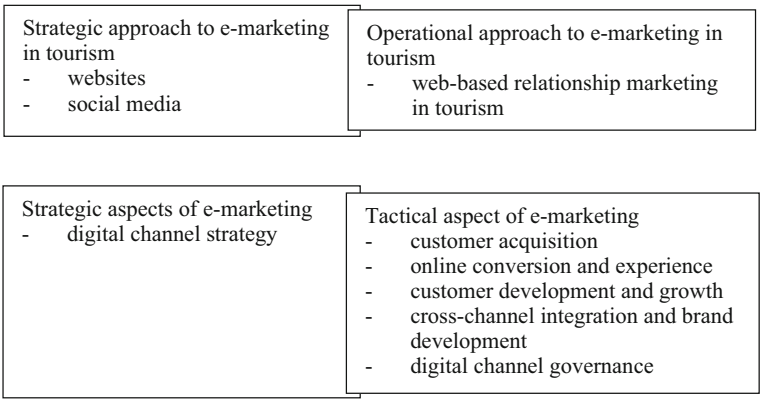

Fig. 3 Dimensions of digital marketing capabilities in tourism and marketing studies (applied from Ip et al., 2011; Law et al., 2014; Chaffey, 2010)

Concluding the literature review on research on e-marketing in tourism and the study on digital marketing capabilities, key aspects of e-marketing activities, forming the digital marketing capabilities, can be identified. The dimensions are summarised in Fig. 3.

Looking at the ongoing discussion on e-marketing in tourism research and on digital marketing capabilities in marketing literature, similarities and differences between the classifications can be found.

Firstly, both pieces of literature discuss e-marketing activities. However, the marketing literature relates the activities to the capabilities. Very much alike, the studies on e-marketing in tourism and the studies on digital marketing capabilities highlight the digital channels as a strategic dimension of e-marketing activities. However, the studies on tourism e-marketing focuses solely on websites and social media as channels in contrast to the research on digital marketing capabilities adopting a broader perspective by emphasising digital channels, in general, as a strategic dimension of digital marketing capabilities.

Beyond the e-marketing strategy, the tourism studies focus on the web-based relationship marketing activity as an operational approach. The studies on digital marketing capabilities take a more detailed look at the activities by identifying several tactics aspects of digital marketing capabilities, which, however closely relate to the dimension of web-based relationship marketing. Further, whereas the tourism research on e-marketing has primarily examined the antecedents and consequences of e-marketing, the marketing literature on e-marketing has focused on more detailed content of marketing activities. By supplementing the conceptualisation on e-marketing adopted in tourism with the studies on digital marketing capabilities in marketing theory, a more comprehensive and detailed analytical description for studying the capabilities can be provided.

3 Research Methodology

The study employs a case research strategy, which refers to an empirical inquiry in which a small number of cases are selected and assessed in a real-life context and scores obtained from these cases are analysed in a qualitative manner (Dul & Hak, 2008). Case studies are particularly suitable when a theory is being developed rather than tested (George & Bennett, 2005; Dubois & Gadde, 2002) and when research topics are defined broadly and not narrowly in a real-life context (Yin, 2003). Such is the case with this research project, which aims to increase understanding of the influence of ICT uptake on digital marketing capabilities in a tourism SME setting.

The study was conducted using a multiple comparative case design, i.e., an internal examination was conducted in which various objects of study are contrasted with each other in more than one instance (George & Bennett, 2005; Dul & Hak, 2008). This is done as a means of obtaining final research evidence. The case in this study is an SME in the tourism business, which was selected because SMEs are more prone and agile to seize upon an opportunity to use new ICT-based tools than are large companies with respect to e-marketing. Previous empirical studies have primarily focused on large tourism companies. On this basis, it can be argued that SMEs possess relevance in a business setting because they will help broaden our scope of understanding of ICT uptake in tourism companies of more than one size, which follows the logic of case research strategy.

SMEs were selected that had participated in a training programme concerning digitalisation in business. The training programme began in May 2016 and will be finalised in January 2017. Among the 14 tourism companies enrolled in the programme, three SMEs were selected as cases for further analysis because they were active in using Internet-based marketing tools in their marketing activities during the programme, and hence, already possessed the initial potential to reveal new insights about the phenomenon under study. Furthermore, the use of search engine marketing (SEM) was emphasised in the programme, which is an interesting yet rarely studied topic in tourism research (see Law et al., 2014). It is noteworthy that the ICT-based tools in this context refer to the web-based marketing tools used by

Table 1 Description of the case SMEs

	Size (employees)	Customers	Tourism services
Outdoor activity service company	2 full-time employees 10 part-time employees	95% individuals 5% organisations	Hot-air balloon trips
Travel agency	5 (incl. 2 owners)	50% individuals 50% organisations	Outgoing and incoming tours
Hotel	50 full-time employees 50 part-time employees	30% individuals 70% organisations	Accommodation and restaurant services

the SMEs such as search engine optimisation (SEO), Google Adwords and Google Analytics. A description of the three case SMEs is provided in Table 1.

The outdoor activity service company and the travel agency are both micro-sized companies in terms of the number of full-time employees. Whereas the former company has two full-time employees, the latter company has 5 full-time employees. The hotel has 50 full-time employees, which makes it representative of a medium-sized company. Individuals constitute the primary customer segment of the outdoor activity company. Despite prioritising individuals, organisational customers, such as companies and associations, are also acknowledged as being important market segments for the outdoor activity company. Likewise, companies and associations account for 70% of the hotel's customers. The services provided by the companies include hot-air balloon trips, outgoing and incoming tours, and accommodation and restaurant services in the castle hotel.

The study was conducted using abductive reasoning (Nonaka & Takeuchi, 1995), also known as systematic combining (Dubois & Gadde, 2002), which refers to the process of continuously moving between an empirical world and a model world (Dubois & Gadde, 2002). The abductive approach is suitable for case research, where a close link between theory, an empirical phenomenon and method is needed (Dubois & Gibbert, 2010). Reliance upon theoretical concepts to guide the design and data collection process for case studies remains one of the most important strategies for completing successful case studies (Yin, 2003). Therefore, the role of theory was to provide inspiration for the research design and data collection process (i.e., the interview themes were based on theoretical discussions), without limiting exploration within strict theoretical boundaries. The goal was to reveal new aspects as they appear in real life. However, the emerging aspects were ultimately combined with the theoretical concepts based on the selected research logic.

The data was collected via the semi-structured thematic interview method (Miles & Huberman, 1994). By employing this method, a phenomenon was recorded in the manner in which the informants perceived it. One informant from each company was selected for the interview. The informants were involved in e-marketing on a daily basis and participated in the training programme where the web-based tools were

used. The interviews were conducted using the online tool Skype between 28 August and 7 September of 2016, after the companies had participated in the training on internet marketing. The reason for conducting the interviews only after the intervention was that the representatives of SMEs are usually unable to articulate the precise needs and objectives of their participation because the ICT-tools and the benefits are unknown beforehand. Each interview was recorded, which offered researchers the opportunity to check the content afterwards. The unit of analysis was a particular outcome as a result of ICT uptake. The analysis of the interviews followed a three-step procedure, including data reduction (i.e., the material was organised based on the themes in question), data display (data was organised into matrices) and drawing conclusions (Miles & Huberman, 1994, p. 10).

4 Research Results

The initial inductive findings indicate that the use of web-based marketing tools transforms digital marketing capabilities rather than replaces a former capability with an emerging one. In this sense, the marketing capabilities of SMEs cumulate. The informants intuitively adopted a before-and-after uptake perspective when describing and contrasting the outcomes, by showing the development of the ICT uptake. Hence, the digital marketing capabilities seem to be dynamic and supplementary in nature. The capabilities indicate the different degrees of readiness for handling the particular issues at hand. Therefore, both the extant and emerging capabilities are relevant when a company seeks to introduce more e-marketing.

Four digital marketing capabilities were identified from the data, each of which is transformed as a result of using web-based marketing tools: the ability to integrate online channels, the ability to guide a customer's online journey, the ability to perform goal-oriented website planning, and the ability to acquire customers from new market areas. The capabilities are analysed by using the model of digital marketing capabilities described in the literature review, and summarised in Fig. 4.

First, the participants perceived the online channels as being fragmented before the use of webpage marketing tools. They regarded each channel as a single unconnected channel in daily marketing activities without there being any clear links between them. After the uptake, they reported forming an overall picture of the online channels and an ability to integrate channels, thus enhancing marketing activities.

The analysis of the data reveals that successfully guiding a customer's online journey is an emerging marketing capability, which participants reported realising to a greater degree after using the tools. Previously, the companies had informed customers on the websites and not provided them with clear opportunities for action. This transformation is described in the following way:

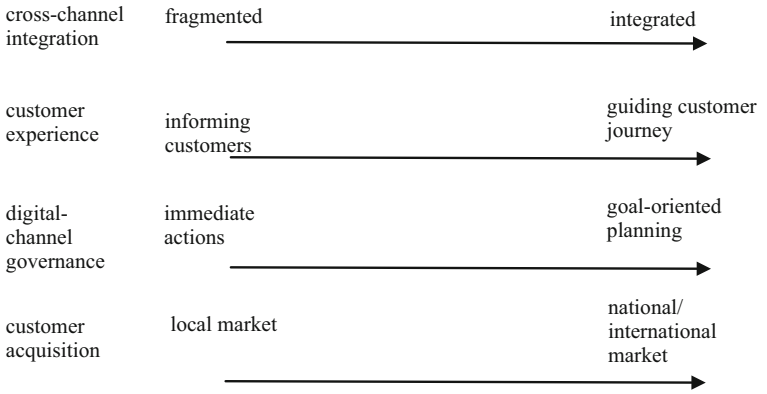

Fig. 4 The transformation of digital marketing capabilities

> '*Now I have realised that we have to offer some kind of action to customers, this is the goal towards which the customer needs to be guided.' (Informant 3)*
>
> *'We have clearly decided what the customers need to do on the websites.'(Informant 2)*
>
> *'We have tried to improve the websites in a way that they are more customer-friendly for advancing sales' (Informant 1)*

In addition, use of the online tools resulted in an enhanced ability to adopt a goal-oriented approach for website planning (including content generation) and overall design and analytics, instead of merely taking single actions when designing a company's web pages. However, it is noteworthy that the immediate actions, for example, in updating the websites were still highlighted, showing an intense interplay between the earlier and emerging capabilities of a company.

Finally, within a relatively brief time period, one of the companies was able to enter the new market area for acquiring new customers. Earlier, the company had advertised for local people in the local newspaper. After the usage of web-based marketing tools, the company initiated an e-marketing campaign at the national and even international market.

Companies faced several consequences as a result of transforming their marketing capabilities. First, employees' skills at using such web-based tools as Google Analytics were improved to an extent that the companies were able to analyse the traffic and customer conversions by themselves instead of purchasing the services. This ultimately led to two of the three companies cancelling their contract with the marketing agency, and one of the companies did not purchase the services when they were offered.

Second, the experience of using web-based marketing tools and an ability to analyse the results led to changing meeting routines. Two of the companies started to report on the website marketing activities and the results in their weekly meetings, hence making the activities more goal-oriented and enhancing the data-based decision-making. Simultaneously, an understanding of website marketing increased

among the other employees. One of the companies even started to train its partner company to use web-based marketing tools.

The aforementioned discussion reveals several digital marketing capabilities, which were advanced due to web-based marketing tools. To summarise the discussion, the use of tools transformed the capabilities of companies from merely floating when conducting e-marketing to leading goal-oriented e-marketing actions. The former floating tactics typically included the fragmented use of channels, the one-way communication to the customers, quick single and unconnected actions without a clear goal, and targeting services and communication only at the local market. The development of the digital marketing capabilities through the use of web-based marketing tools resulted in leading tactics in e-marketing, which means that the online channels are more integrated, the activities are guided by the mindset of a customer's online journey, the activities are goal-oriented and the new market areas are achievable.

5 Discussion

This paper started by arguing that digital marketing capabilities are poorly understood in the literature on e-marketing in tourism. A selected overview of the extant tourism literature shows that the research on e-marketing in tourism focuses mainly on the e-marketing strategy and web-based relationship marketing, hence adopting marketing as a business function approach. Only a limited set of studies has acknowledged the role of capabilities in e-marketing and its impact on business performance. However, this study shows that the e-marketing approach needs to be broadened with the digital marketing capability perspective emanating from the marketing studies, and the discussion on e-marketing in tourism needs to be enriched with the 'marketing as a set of skills' perspective.

This study further shows that digital marketing capabilities develop through the usage of ICT uptake, hence supporting the discussion on digital marketing capabilities in marketing literature. The major dimensions that transform as a result of the ICT uptake relates to the cross-channel integration, customer experience, digital channel governance and customer acquisition.

The scant tourism literature has examined e-marketing capabilities mainly in the context of large hotels. In contrast, this study examined the capabilities in the setting of SMEs. This study departs from the earlier studies on e-marketing in tourism and literature on digital marketing capabilities by emphasising tactical planning in conducting marketing activities rather than e-marketing strategies.

There are several identifiable limitations in the study, which simultaneously offers new avenues for further research. First, the literature review provides only a selected overview of studies on e-marketing in tourism and on digital marketing capabilities in marketing theory. Future research could broaden the review in order to deepen and uncover potential new dimensions of digital marketing capabilities in tourism and hence, enrich a subsequent analytical description. Second, the sample size is limited

to three cases in different tourism domains. Future research could extend the sample size and analyse the capabilities according to the different dimensions of SMEs. Third, the empirical research focuses only on specific web-based marketing tools, which could be replaced by using back office-related ICT-tools in order to uncover the relevance of digital marketing capabilities. Fourth, the research primarily focuses on the digital marketing capabilities of b2c marketing. The further research could dig deeper into the capabilities necessary for b2b marketing. Finally, digital marketing capability, in terms of floating to leading (the key finding in the study), could also inspire researchers to examine this in the e-marketing literature, in general. The topic will, however, grow in importance in the future.

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Entrepreneurship in the Contemporary Tourism Ecosystem: The Case of Incoming Tour Operators in Taiwan

Alex Yang-chan Hsu, Brian King, Dan Wang and Dimitrios Buhalis

Abstract Information technology advances provide alternative distribution and marketing strategies for tour product suppliers in the destination. Technology-enabled innovations empower tourists to deal directly with tour component suppliers and to pursue more customized and experience-based tour products. Disintermediation between consumers and suppliers has threatened the business sustainability of incumbent inbound tour operators (ITOs), which are still reliant on an economic logic of information asymmetry and the multi-layered distribution system. While established companies in conventional mass tourism may be concerned about the trade-off between technology investment and financial return, start-up entrepreneurs grab market opportunities to serve unmet tourist needs with innovative business models and technical expertise. This qualitative research explores how tourism entrepreneurs perceive the impact of technological innovation and how their solutions for visitor needs may replace traditional functions of ITOs in the industry value chain. The results indicate that the proposed progression of this sector is supported with the supplement of a platform business model and open innovation.

Keywords Incoming tour operators · Smart tourism ecosystem · Taiwan

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1 Introduction

Technology advances impact various industries and change the scope of businesses. While the tourism industry is traditionally considered as the laggard of technological innovation, its stakeholders are confronting disrupters with technical solutions for tourist needs under a more profound and alternative approach, predominantly with the progress of information communication technology (ICT) (Buhalis & Law, 2008). Pioneering ICT advocates with the platform business model often redefine the industries (Sigala, 2015). In tourism, online travel agencies (OTAs) penetrated worldwide travel markets while proposing that hotels would benefit from their intermediary service for advertising and distributing purposes (Euromonitor International, 2015). Recent examples include Airbnb, which encourages citizens to lease their under-utilized rooms through a peer-to-peer transaction system as a potential source of income (Guttentag, 2013). These exchange mechanisms have empowered consumers to identify and deal with potential suppliers. Nowadays, major OTAs have partnered with local incoming tour operators to offer day tours and activities for the free and independent travellers (FIT) market. Expedia has extended its product categories to excursions, and TripAdvisor merged the pioneering in-destination tour platform Viator.com (Euromonitor International, 2014). Furthermore, technology giants such as Google help tourists to explore the neighbourhood in real-time (SKIFT, 2016). The popularity of smart gadgets, combined with the advancement of predictive analytics, have resulted in a contemporary tourism ecosystem, where tourism stakeholders are all part of the value co-creation actors to provide tour experiences (Gretzel, Werthner, Koo, & Lamsfus, 2015). It then becomes questionable how the emerging start-ups coexist with the established stakeholders in the current scenario, where there are substitute products serving the parallel touristic needs. This study investigates the entrepreneur's perceptions on the impact of the emerging technological innovation in tourism and explores how and why they join the business, and the potential to reshape the sector. Taiwan was chosen as the case realm for its increasing presence in the travel market of East Asia. Moreover, it has become a phenomenon that various start-ups have been founded to solve tourist needs in very recent years.

2 Literature Review and Theoretical Propositions

2.1 Entrepreneurship and Tourism Innovation

Entrepreneurship is the driver of the innovation as it creates values for the unmet market needs (Schumpeter, 1934). Entrepreneurs then contribute to providing a particular value proposition to deliver solutions to market demands with various resources and design a business model for market success (Osterwalder & Pigneur,

2010). While entrepreneurs in the travel sector are often impacted by seasonality and their based destinations, their challenges often comprise experience services delivery and sustainability issues (Solvoll, Alsos, & Bulanova, 2015).

The latest development of global platforms also provides a mechanism for business operators to focus on their specialty, in terms of services. In addition, Chesbrough (2006) proposed the concept of open innovation, encouraging enterprises to innovate with external resources while the public goods have become so dominant and essential for everyone. Moreover, the investment in technological solutions often requires expertise in technology while it may not be the expertise of tour operations. After reviewing the business model concept over a decade, Lambert & Davidson (2013) proposed that the business model concept is closely related to entrepreneurship and open innovation while companies develop their strategies based on their inner and outer resources. After all, while technology is often widely introduced, tourism companies should develop their business model to differentiate themselves from their competitors (Souto, 2015).

2.2 *The Contemporary Tourism Ecosystem and Value Co-Creation*

The concept of "smart" travel is becoming realized with the development of data analytics, sensor technologies, and mobile gadgets, and has resulted in an open system where tourism stakeholders are all connected (Gretzel et al., 2015). Moreover, the barriers among tourists, residents, and suppliers have become unclear. Tour components, such as accommodation, transportation, attractions, and guiding services, are now offered through different mechanisms, such as consumer communities and supplier networks, which provide alternative options for a journey. Furthermore, Gretzel et al. (2015) proposed that tourist experiences will be more information-driven and value co-creation oriented. In such a scenario, traditional tourism stakeholders, though remaining relevant, should adapt to the smart tourism ecosystem when their functions may be superseded, i.e. destination marketing organizations and travel agencies.

Vargo and Lusch (2004) introduced the service-dominant (S-D) logic as a refinement of the goods-dominant (G-D) logic. They argue that value should not be consumed but co-created by consumers and suppliers. Conventional travel products are often designed and distributed in a G-D logic, and the products are offered to end customers through agencies and operators. Vargo and Lusch (2008) further advise that suppliers should acknowledge that the value of their services is co-created and co-produced by tourists while their perception and knowledge also impact the overall experience. Moreover, the actor-network theory (ANT) implies that enterprises and customers are all players serving the beneficiary parties (Arnaboldi & Spiller, 2011). It is important to identify that all actors are part of the resource integration system, inputting their operant resources, (i.e. human talents)

with operand ones (i.e. static machines) for value creation (Wieland, Polese, Vargo, & Lusch, 2012). Furthermore, O'Cass and Sok (2015) investigated the value proposition in the context of tourism services and argued that customer-centric and supplier-facilitated services may accumulate more value for tourists.

In an ecosystem, Adner and Kapoor (2010) proposed to differentiate the impacts from the supplier and consumer components on the benefits of focal companies. If it is harder for suppliers to integrate their resources, it will provide better opportunities for the technological middlemen. In addition, if it is easier for buyers or complementors to integrate, the company may benefit from the overall innovative system.

2.3 Incoming Tour Operators

For incoming tour operators, their traditional roles are providing touring services for the outbound travel agents in the source market and distributing the tour components for the market of origin (Dörry, 2008). While international OTAs are penetrating their market through directly linking suppliers to consumers, established ITOs often suffer from a decreasing demand for their distributing services and thus reduce the profit margin (Euromonitor International, 2015). In addition, they still act as the principal to deliver tour services. Tourism practitioners often feel that there is always a need for the services while human services are still valuable though under the threat of disintermediation (Law, Leung, Lo, Leung, & Fong, 2015). More incoming tour suppliers offer their services through an online presence. Their business model can be categorized by their value proposition for customers, including direct to clients; full-service providers; the whole of the enterprise; intermediaries; shared infrastructure; virtual community; value net integrator; and content provider (Weill & Vitale, 2001).

2.4 Theoretical Proposition of the Present Study

This study aims to investigate how tourism entrepreneurs perceive the impacts of technological innovation and explore their potential to reshape the industry. Yin (2014) proposed to develop propositions in order to set the directions of the research and to retrieve evidence to support the statements for qualitative research. The propositions are prepared as below:

Proposition 1: Entrepreneurial suppliers facilitate services to co-create experience with tourists for innovative tour products.
Proposition 2: Entrepreneurial suppliers co-create value of innovative in-destination tour products with tourists.

Proposition 3: Entrepreneurial suppliers incorporate external resources for innovative tour products within the product offerings.
Proposition 4: Entrepreneurial suppliers embed customer-oriented business models for innovative in-destination tour products.

3 Methodology

To investigate the tourism start-up phenomenon, Taiwan was chosen as the case context while the number of its visitors tripled to 10 million people in the past decade. Moreover, with the transition of regional country competitiveness and the foreseeable future then, a variety of tourism start-ups have been founded since 2013. The emergence of tourism start-ups in Taiwan has become a contemporary phenomenon. Yin (2014) suggested investigating such movements under a multiple case study approach. The primary investigator was born in Taiwan and has seven years of working experience in the tourism business. With some networks in the sector, the researcher decided to apply snowball sampling (Hennink, Hutter, & Bailey, 2010) to reach the geographically disperse tourism entrepreneurs, who are often new to the industry with a relatively small company size.

The researcher contacted one of his former colleagues who initiated a non-profit organisation (henceforth the Association) to support and collaborate with these new businesses providing solutions to tourists. The Association organises monthly seminars to introduce these tourism start-ups to the public and to connect with the latest newcomers. The introductory workshops are often familiar with approximately 60–80 participants in each session, which often take place in a café or coworking space in Taipei, Taiwan. From 11 to 25 July, 2016, the organiser set up recruitment dinner meetings for potential employees to interact with the tourism start-ups. The dinner meetings were relatively small-scale and diverse due to the size of participants. Numbers of participants ranged from 6 to 50 people based on the popularity of the recruitment companies. The venue was at the organiser's apartment, located on the fourth floor of an old apartment in the city. The organiser had to connect three tables together to accommodate the guests and speakers. Intern students prepared dinners for all participants. While some of the start-up companies had a recognized brand name, others were still struggling to design a sustainable and convincing business model.

In total, the researcher participated in two public seminars and ten dinner events to observe and engage with these tourism start-ups. This gave the author a great opportunity to observe and participate in the phenomenon directly. Thick data were also retrieved from question and answer sessions for analytical purposes. The researcher considered himself as the objective instrument though he was fully aware of his presence in the setting. As a doctoral student, he prepared himself to engage in the conversations with the participants and speakers. The companies were found

Table 1 Sample companies

Category	Company	Main travel products/travel solutions	Target markets
ITO	ITOA	Customized tours, half-day/one-day tour products	English-speaking customers
	ITOB	Customized tours, half-day/one-day tour products	English-speaking customers
	ITOC	Half-day/one-day tour products	Chinese-speaking customers
	ITOD	Customized tours, mini-tours	Chinese-speaking customers
	ITOE	Adventure; customized tours	Chinese-speaking customers
Platform for component suppliers	PLTA	In-destination tour products	FIT tourists; Asian market
	PLTB	In-destination tour products	FIT visitors; Asian market
	PLTC	Tour guides	FIT tourists
	PLTD	Tour guides	FIT tourists
	PLTE	Accommodation; Hotels; B&B	FIT tourists
	PLTF	Accommodation; Hotels	FIT tourists
	PLTG	Accommodation; B&B	FIT tourists
	PLTH	Transportation	FIT tourists
Platform for marketing content	PLTI	Travel information	FIT tourists
	PLTJ	Travel information	FIT tourists
	PLTK	Travel information	FIT tourists
	PLTL	Travel information	FIT tourists

to share similar characteristics regarding foundation year, business interest, and tourist experience-orientation. Seventeen out of 26 companies were selected as the study cases (Table 1), and were categorized into three groups including inbound tour operators with a more traditional business model, platforms or booking websites designed for end consumers, and start-ups focusing on marketing content and information sharing. One also provides consulting services to help suppliers promote their products to customers.

After these seminars, the researcher invited seven of the most proactive founders or managers for in-depth interviews in August 2016 (Table 2). ITOA and ITOB are both pioneering companies in Taiwan targeting English-speaking tourists and founded less than five years ago. Both collaborate with international platforms to promote their services. Moreover, PLTA and PLTB are both platform companies trying to link tourists with in-destination tour operators. PLTA has chosen to firstly target Taiwanese tourists travelling to foreign countries while PLTB is more ambitious targeting international tourists to visit Taiwan. PLTC is a platform calling

Table 2 Interviewee company background

Business model	Company name	Title of interviewee	Company background
Inbound tour operator (B2C and B2B)	ITOA	CEO (Founder)	Founded in 213, the company has greeted international celebrities and established its brand name on TripAdvisor. While focusing on English-speaking customers, ITOA provides customized tours and daily excursion products
	ITOB	Sales director (Founder)	Founded in 2013, ITOB started its business in a niche market of international visiting scholars and gradually gained fame through public relations. It now provides customized tours and day tour products for English-speaking customers
Platform for component suppliers	PLTA	Marketing manager	Founded in 2014 and launched in 2015, PLTA has become of the most famous travel platforms for in-destination tours in the region. It has opened various offices in Asia and provides worldwide local tour products
	PLTB	Founder and president	Founded in 2015, PLTB focuses on discovering authentic local experiences in the destination. It has opened some overseas offices and aims to expand regionally
	PLTC	Director of information technology	Founded in 2016, PLTC is a subsidiary of a larger property company. The platform seeks to find local experts to provide in-destination tour services for international guests
Platform for marketing content and information	PLTI	CEO/ Co-founder	Founded in 2015 and launched in 2016, PLTD provides travel information integrated from peer-to-peer sharing and sources from international platforms with a mobile APP and website interface
	PLTL	CEO (Founder)	Founded in 2013, PLTE focuses on discovering points of interest in Taiwan and on storytelling of local attractions for experience seeking tourists

for local tourism experts to register and provide services to foreign visitors. PLTD and PLTE are both online marketing companies aiming to provide travel information about the destination. PLTD is motivated to provide total solutions to travellers through linking suppliers to directly put their contents on the platform while PLTE is keen to develop its own content by hiring professional camera operators for photo shooting.

The duration of interviews was one hour on average and ranged from 30 min to 1.5 h. The interviews were recorded by iPhone 6s Plus with iOS application AudioNote with the permission of the interviewees. The contents were transcribed and coded for content analysis. While the official language in Taiwan is Mandarin Chinese, the author shared the data with the other Chinese researcher to ensure the quality and accuracy of the content.

4 Results

4.1 Supplier-Facilitated Services from Emerging Incoming Tour Operators

Traditional ITOs concentrate on distribution and content marketing as in-destination component suppliers. In addition, ITOA and ITOB focused on creating an excellent tour/experience service delivery. While ITOs are mediators of tour experiences, their customer base has been extended and enabled with technology advances, i.e. platform companies. Both companies ITOA and ITOB focus on delivering the unique, designed, and customized experiences to their customers through integrating young talents with given resources. The informant from ITOA said that "tourism start-ups have different mindsets from incumbent ITOs. They are more consumer-centric and would like to solve tourists' problems rather than just make money." For distribution purposes, PLTA and PLTB are willing to distribute their local tour suppliers to international travellers. The informants believed that the regular group tours are losing their charm in today's market environment when the younger generation desire more flexibility. Proposition 1 is supported while the two founders are eager to find the talents who are inspired to greet their clients whenever there are service encounters.

4.2 Value Co-creation from Emerging Incoming Tour Operators

All informants recognized the fact that the value of tour experiences arises when the tourists are on their journey. Both ITOA and ITOB have particular travel segment markets, i.e. the English speaking visitors. They need to design products according to the tourists' needs and up to the international standard so as to satisfy the guests. In addition, companies with platform business models also desire to engage with visitors. Based on their expertise, business mindset, and the target segments, while

PLTB aims to promote the hidden beauty of the suppliers in Taiwan, PLTA focuses on worldwide tourist destinations.

Moreover, PLTC and PLTI would like to solve tourists' needs through connecting customers to professional or amateur tour services. PLTL is interested in helping suppliers to market their products or services. While all companies provide solutions for their clients, PLTC and PLTI seems more positive about the capability of freelance individuals while others believe there is still a need for professional tour guides. Through liberalizing the commission-based business model, informants believe that customers are willing to pay for the optional services. It is vital to provide the platform mechanism for tourists to customize their desired experiences instead of a lump-sum payment for products that suppliers are offering on a G-D logic. After all, there are more potentials beyond matching for platform systems.

4.3 Open Innovation and Business Model Innovation from Emerging Incoming Tour Operators

It is quite obvious that ITOA and ITOB cooperate with international OTAs or platform giants, and use social media to increase the exposure to potential buyers. In addition, platform companies often create the mechanism and invite amateur peer-to-peer sharing for companies to manage cost and develop distribution strategy. Interestingly for PLTI, the informant disclosed how they need to collaborate with TripAdvisor to obtain data in real-time. In addition, it is argued that there will be different giant platform companies impacting all the business (Table 3).

Table 3 Evidence retrieved during the analysis

Proposition	Company
Supplier-facilitated services	ITOA; ITOB
Co-created experience with tourists	ITOA; ITOB
Value co-creation	
Value in use	ITOA; ITOB; PLTA; PLTB; PLTC; PLTI; PLTL
Tourists as co-producers	ITOA; ITOB; PLTA; PLTB; PLTC; PLTI; PLTL
Open innovation	
Use of external technology	ITOA; ITOB
Technology provider	PLTA; PLTB; PLTC; PLTI; PLTL
Customer-centric business model value proposition	
Direct to clients/full-service providers	ITOA; ITOB
Intermediaries/shared infrastructure	PLTA; PLTB; PLTC
Virtual community	PLTC; PLTI; PLTL
Value net integrator/content provider	PLTI; PLTL
Customer-centric	ITOA; ITOB; PLTA; PLTB; PLTC; PLTI; PLTL

4.4 *Customer-Oriented Business Models from Emerging Incoming Tour Operators*

Tourism start-ups are concerned about whether they can engage with customers and establish relationships with potential users. However, their strategies are quite diverse. PLTB and PLTI hope to implement predictive analytics and machine learning for efficiency and cost-saving benefits. In addition, ITOA and ITOB still rely on on-the-job training to establish their professionalism. Moreover, for marketing platforms of PLTI, and PLTL, it was identified that they prefer to create virtual communities so that they can have a precise market segment and match corresponding suppliers.

5 Conclusion

In an industry as vulnerable and attractive as tourism, its stakeholders should expect the substantial challenges driven by entrepreneurship along with the progression of technology advances. Traditional distribution mechanisms of hospitality are based on a G-D logic while S-D logic has been realized and proven by modern smart technologies and data science. In the contemporary tourism ecosystem with the blurring boundaries between tourists and residents, suppliers, and consumers, it is predictable that the current platform economy will continue to grow and evolve, thus reshaping the industry.

This study investigates tourism entrepreneurs' perceptions of the potential impact on technological innovation and their strategies for institutional growth. Drawing upon existing literature, the authors proposed to examine the phenomenon from the perspectives of supplier facilitated experience, co-creation, as well as business model and open innovation. Through studying the functions of traditional ITOs, it has been identified that OTAs and other similar platforms have a substitution effect on the distribution function. For its principal function as a mediator of tour services, while human interaction and encounters are still suppliers facilitated for a memorable journey experience, tourism start-ups may consider what hinders newcomers from joining the competition. Surprisingly, a majority of travel start-ups in the context of Taiwan often work for other industries before deciding to accede to the business. With their expertise in information technology, it seems that most of them hope to follow the successful pattern of other platform companies via linking peer-to-peer under-utilized inventories while neglecting the fundamental characteristics of the tourism industry as services suppliers. The authors have developed a conceptual map to include the propositions with the phenomenon of tourism start-ups in the contemporary ecosystem (Fig. 1). The three types of travel start-ups correspond to the primary functions of a traditional ITO business model, including marketing, distribution, and tour services.

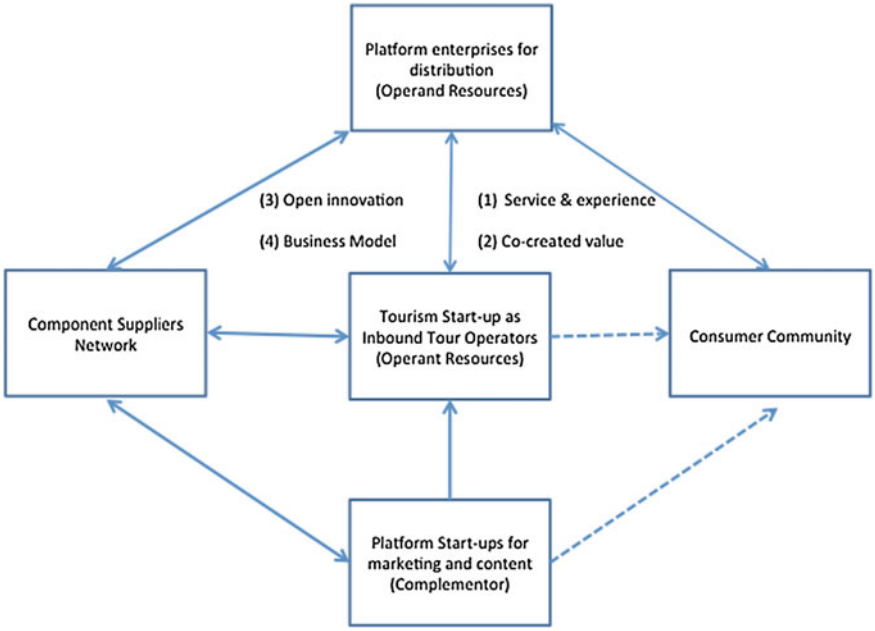

Fig. 1 Conceptual framework

The authors suggest differentiating the components from the supplier and consumer perspective in an ecosystem while their levels of integration may impact the innovativeness of the overall system (Adner & Kapoor, 2010). While agreeing with the statement by Solvoll et al. (2015) that "the field of tourism entrepreneurship is rapidly changing" (p. 11) in their recent literature review on tourism entrepreneurship, it may be important to understand the phenomenon in the bigger picture where the scope of tourism has been expanded to everyday consumption. While it may take time for resource integration, more individuals may be encouraged to join the business and thus ultimately reshape the interface.

5.1 Implications for Practice

This research provides insights for industry practitioners. Though the study was conducted in Taipei, Taiwan, the observation of the blurring boundaries among industries has become significant. Disruptive innovation occurs where there are suddenly better and cheaper substitutes. For an industry heavily reliant upon the workforce, the next generation of artificial intelligence may have another significant impact when machines take over the repeat and excessive work and people can use their knowledge and information to find the next breakthrough opportunities.

Moreover, tourism entrepreneurs may consider carefully about their resources and strengths so as to create a business model for sustainability and the future. Moreover, when more individuals with entrepreneurial spirits are encouraged to offer their services for tourists, incumbent ITOs should strive to establish their professionalism as core competitiveness in the ecosystem.

5.2 Limitations and Prospects for Future Research

The authors acknowledge that there are several limitations to this research. Taiwan was chosen as the study site. As an emerging destination, Taiwan is still a more regional destination under the shift of industry transit. Moreover, Taiwanese entrepreneurs' expertise in regard to coding may not be a strength shared by others. The findings may be supported using more measurements for triangulation if the research can be conducted in other emerging destinations.

Overall, this present study indicates how a popular platform business model has been developed in tourism. Entrepreneurs may consider the development of their roles and functions in the contemporary tourism ecosystem so as to contribute more to unmet market needs and the potential growth.

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Spill-over Effects of Online Consumer Reviews in the Hotel Industry

Sangwon Park and Jason Li Chen

Abstract The purpose of this research is to investigate and estimate the spill-over effects of online consumer reviews as a proxy to reflect hotel performance, focusing on 689 hotels located in London, UK. This study used a series of data mining approach to collect estimated variables from a travel search engine website (i.e., Kayak.com) and made the first attempt to apply spatial econometric modelling at the firm level in the tourism and hospitality field. The findings of this research identified a complementary effect of consumer rating between neighbouring hotels, and showed the spatial dependency of room prices across hotels at the destination. Furthermore, a local estimation using geographically weighted regression approach allows researchers to understand the spatial variations of the spatial effects. Important implications for tourism and hospitality managers to develop regional marketing and promotions are provided.

Keywords Data mining · Spill-over effect · Online consumer reviews · Spatial economic modelling

1 Introduction

There have been a number of studies identifying factors that affect hotel performance/satisfaction, such as hotel attributes (e.g., rooms, facilities, service quality, etc.), pricing, location, and security (Zhou, Ye, Pearce, & Wu, 2014). The main focus of extant studies about hotel management is on their internal strategy; however, this research highlights the importance of spill-over effects associated with a specific type of spatial interaction among hotels within a certain place. That is, since the different accommodations located in the same place interact with each other (Ritchie, Crotts, Zehrer, & Volsky, 2013), the operational strategy (e.g., pricing) as well as guest experiences (i.e., online consumer reviews) may drive the

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gross demand for the tourism place and, in turn, influence the performance, not only of a given hotel but also other hotels in the region. Analysing spill-over effects has largely been considered in the tourism field in terms of understanding tourist flow, and assessing the effects of the external environment (e.g., oil prices and recession) and mega events on tourism demand (Gooroochurn & Hanley, 2005). In addition, some hospitality studies have examined spill-over effects to explain the influence of co-branding and foreign direct investment (Mao & Yang, 2016).

The advancement of information technology enhances consumer empowerment, as people can share their experiences of hotel consumption with other consumers at any time and from any place (Liu & Park, 2015). In this sense, managers in the tourism and hospitality industry largely concern the consumer ratings which have been regarded as a proxy to reflect the firm performance (Ye, Law, & Gu, 2009). In this sense, information system scholars recently demonstrated the existence of spill-over effects in the context of online reviews, where an online comment from one customer affects the reactions of other consumers to leave online reviews regarding their consumption (see Chae, Stephen, Bart, & Yao, 2015; Janze, 2016).

In particular, current travellers can easily compare room prices through various online booking channels (e.g., Kayak, Booking.com, etc.). This comprehensive information enables people to estimate 'value for money' in regard to opportunity cost against the choice of another given hotel, recognizing the specific room rate. Consumers are likely to present a satisfaction behaviour rather than an optimising behaviour when evaluating travel products (Clemons & Gao, 2008). Therefore, the aim of this research is to estimate the spill-over effects between hotels in the context of online consumer reviews with considering room prices.

2 Literature Review

Spill-over effects have gained significant attention from tourism scholars, particularly in understanding tourist flow (Gooroochurn & Hanley, 2005), as well as in assessing foreign direct investment and productivity in the accommodation industry (Yang & Mao, 2015). From the economics perspective, the spill-over effect can refer to both positive and negative externalities derived from the economic activities or processes which influence any elements not directly linked with the activity (Yang & Wong, 2012). With regard to tourist flow, it is identified that a city surrounded by an area with a thriving tourism industry can receive the positive spill-over effects in tourist flows (Yang & Wong, 2012). In other words, travel destinations can receive distinctive benefits connected with proximity or spatial groups that improve attractiveness to tourists who plan multi-destination trips (Yang & Fik, 2014). It is suggested that cities, particularly those which are less developed places for travel, could obtain mutual benefits with neighbouring cities to support local tourism development with regard to a cross-city spill-over effect. It

also can be argued that the spill-over effect would be widespread in the hotel industry, where a region's hotel industry exerts influence on gross number of guest visits to hotels in other regions and/or those accommodations located in the same region. In other words, a hotel in a specific region can be influenced by the strategy of adjacent hotels in terms of either positive or negative spill-over effects.

Following the development of information technology, online travellers can easily share their hotel experiences via social media websites. These comments play a key role in affecting future travelers' hotel choices because travellers perceive that online comments are more reliable and/or trustworthy than information provided by hotel marketers. As such, online consumer ratings have been regarded as one of the determinants of product sales and price premiums (Öğüt & Onur Taş, 2012). A study conducted by Park and Nicolau (2015) identified that directional reviews (i.e., extremely positive or extremely negative ratings) that allow travellers to understand the expected advantages and disadvantages derived from the hotel consumptions are much more helpful than ambiguous information. Indeed, in terms of a decision net model, it is a fact that travellers are likely to make a destination decision first and then consider accommodation as a secondary decision (Park, Nicolau, & Fesenmaier, 2013). This implies that, given a destination at the initial stage of travel planning, the online consumer ratings of a hotel affect not only the demand for that hotel, but also the demand for other hotels located in the same region.

In this vein, there are several studies that demonstrate the spill-over effects in the context of online consumer reviews (e.g., Chae et al., 2015; Janze, 2016) based upon the statement that spill-over effects indicate the extent to which "existing information and perceptions influence beliefs that are not directly addressed by or related to the original information source or perception object" (Janakiraman, Sismeiro, & Dutta, 2009; p. 2). Janze (2016) identified cross-organizational spill-over effects in user-generated online service reviews. Specifically, the study examined how the perception of consumers of a service provider expressed in online reviews is affected by interdependent service providers, for instance, airports and flights. That is, increased (decreased) overall ratings of a service node (i.e., airports) are linked with increase (decrease) of consumer ratings on those things following the service node (i.e., flights). This phenomenon was explained by a concept of treatment-by-association (TBA) closely related to guilt-by-association (GBA). TBA refers to the perceptual attribution of positive and negative features to units (or entities) due to the units they associate with and incorporate implicit memory (Janze, 2016). In other words, TBA is associated with the psychological concept of priming, that is, a process by which an experience (or perception) of a unit (event, item, person, or object) leads to an increase in the approachability of related material or behaviours (Baumeister & Vohs, 2007). For example, when someone experiences a very pleasant flight, their openness to positive feelings and emotions will be increased when using the airport of arrival. Accordingly, based

upon the assumption that hotels in a travel area are interdependent service nodes, the notion of TBA is appropriate to account for the spill-over effects in online hotel reviews.

Chae et al. (2015) proposed three typologies of online spill-over effects (focal product spill-overs, brand spill-overs, and category spill-overs) to understand online word-of-mouth (WOM) effects at the brand and category levels. Among them, category spill-overs are particularly relevant to the hospitality industry, defined as WOM generated by general consumers about products from the same category as the focal product. The study by Chae et al. (2015), sheds light on (1) spill-over effects with respect to online WOM of the same brand's products in other categories and/or competing products, and (2) spill-over effects of online WOM on other brands' products in the same category. Apart from brand/category-based spill-over effects, Chae et al. (2015) also identified the spill-over effects of online WOM across different segments, corresponding to the two-step flow of the communication model (e.g., Katz & Lazarsfeld, 1955). Specifically, online consumer reviews provided by specialists or experts in a certain product influence the behaviours of online reviews by other segments, such as generalist or less experienced consumers. Interestingly, the results show the positive and negative spill-over effects in the context of online WOM.

Thus, the authors of this research argue that the online consumer ratings of hotels in a certain region involve spill-over effects which influence the performance of other hotels. In addition, there is a substantial literature stating that room pricing is one of key determinants for travellers in choosing a hotel, and a main driver in generating the largest proportion of hotel performance (Oh, 2003). Current travellers can easily obtain sufficient information about room rates and compare them across different hotels by accessing booking channels. This comprehensive information enables travellers to assess 'value for money' with regard to opportunity cost against the choice of another given hotel, recognizing the specific room rate. The concept of value for money had been regarded as an important attribute for hotel satisfaction (Choi & Chu, 2001). In this sense, the perceived value for money obtained by the comparison shows spill-over effects on other hotels' guest experiences. Consumers are likely to present a satisfaction rather than an optimizing behaviour when evaluating travel products (Clemons & Gao, 2008). Therefore, it can be hypothesized that:

Hypothesis 1 The increase in online consumer ratings of hotels in a city is significantly associated with the increase in online consumer ratings of other hotels in the same city.

Hypothesis 2 The increase in online consumer ratings of hotels in a city is significantly associated with the increase in room prices of neighbouring hotels in the same city.

3 Research Methods

3.1 Spatial Autoregressive Model

The spill-over effects can be conceptualised as that values observed at hotel i depend on the values of neighbouring hotels at nearby locations. The longer the distance from hotel i, the weaker such dependence would be. In order to identify and capture the spill-over effects of hotel performance and other explanatory variables, this study applies a spatial Durbin model (SDM) with inclusion of the spatially lagged terms of both dependant variable and independent variables. The SDM is a general form of spatial autoregressive models (SAR) in which spatial dependence across observations is accounted for by the spatially lagged terms. With the inclusion of the spatially lagged dependent variable, estimation biases caused by omitted variables may be reduced (LeSage & Pace, 2009). Given the above conceptual and statistical reasons, this study specifies a SDM in the following vector form:

$$Y = \rho WY + X\beta + WX\theta + \varepsilon, \# \tag{1}$$

where Y is an $N \times 1$ vector of online consumer ratings of overall experience in a sample of N hotels; X is an $N \times 3$ matrix of explanatory variables including the hotel star rating X_1, median room price X_2, and online user rating of service quality X_3; W represents the row standardized ($N \times N$) spatial weight matrix, which conceptualises the spatial relationship; β, ρ, and θ are the vectors of spatial parameters to be estimated; and ε is the error term. Since the coefficients in the model gauge the effects averaged across all the observations, Eq. (1) is referred to as a global model. The parameters are estimated with a maximum likelihood method provided in the R (R Core Team, 2016) package *spdep* (Bivand & Piras, 2015), where ρ is estimated by numerical optimisation first, and β and θ parameters by generalized least squares subsequently.

3.2 Local Estimation

In the tourism literature, it has been found that the effects of tourism activities present spatial heterogeneity across geographic regions (Li, Chen, Li, & Goh, 2016; Yang & Fik, 2014). Spatial heterogeneity refers to the situation when the regression coefficients of spatial lags vary across observations or regions. In this case, a local estimation where coefficients are allowed to vary from hotel to hotel would be beneficial for understanding the spatial variations of the spatial effects. This study applies the geographically weighted regression (GWR) approach (Páez, Uchida, & Miyamoto, 2002) to locally estimating the spill-over effects.

Based on the global model described by Eq. (1), a local model can be specified for hotel i in the sample:

$$U(i)Y = \rho_0 U(i)WY + U(i)X\beta_0 + U(i)WX\theta_0 + U(i)\varepsilon_0, \# \quad (2)$$

where $U(i)$ denotes an $N \times N$ diagonal spatial weight matrix for hotel i. Note that the vectors β_0, ρ_0, and θ_0 are now sub-indexed to denote local parameters that vary from hotel to hotel.

Based on a chosen kernel function and a bandwidth, it assigns weights to the m nearest neighbours (within the bandwidth) of hotel i, and zero to the other hotels in the sample (Ertur, Gallo, & LeSage, 2007). This essentially extracts a sub-sample for each local model. The models can then be estimated recursively (Pace & LeSage, 2004). Due to the smaller sub-sample, local estimates could be very sensitive to local model specifications, Páez et al. (2011) recommend a minimum sample size of 160 for a GWR.

3.3 Data and Variables

The data are gathered from the online metasearch engine KAYAK in mid-August 2016 by applying an automatic crawling method in R. The sample consists of 1832 hotels in London. In line with Eq. (1), the data are collected for all the variables including the overall user rating Y, star rating X_1, median room price X_2, and the user rating of service quality X_3 for each hotel. The median prices across various online providers are collected for one room (2 guests) on the last night of each month spanning from August 2016 to February 2017. A median price across the 7 month period is then calculated for each hotel. To generate the spatial weight matrix W, the latitude and longitude coordinates of each hotel are also collected. Rental apartments are excluded from the sample to ensure the consistency in the hotel star rating. Due to the variations in the hotel availability and missing values across the 7 month period, the sample size is reduced to 689 eventually.

4 Results and Discussions

4.1 Global Estimation

To empirically test whether there is spatial dependence in the variables, this study first estimates a regression model with the ordinary least squares (OLS) method. The spatial autocorrelation in the residuals can be examined. Then the proposed SDM is fitted with the inclusion of spatially lagged terms.

The estimation of a spatial model is sensitive to the specification of weight matrix (W in Eq. 1). As such, an automated routine is developed to choose the

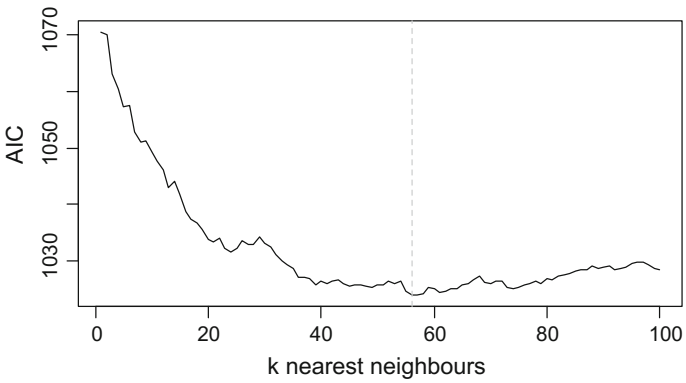

Fig. 1 AIC against adaptive distance band where k is the number of neighbours

weigh matrix specification that generates the lowest Akaike information criterion (AIC) value resulted from various alternatives. As a result, a Gaussian form function is chosen, combining with an adaptive distance band (the maximum distance to the *k*-nearest neighbours), as the weight matrix. The weighting scheme is adaptive because the distance band for each observation may vary depending on the number of neighbouring observations. This is useful especially when the density of hotels varies across the city. Figure 1 illustrates the process of determining the number of nearest neighbours, where $k = 56$ is chosen. The weight for a point at distance d from the focal observation is $e^{-\frac{d^2}{2h^2}}$, where h denotes the adaptive distance band which is the maximum distance to the $k = 56$ nearest neighbours. The distances between hotels are measured by the Great Circle distance based on their longitudes and latitudes. Once the weight matrix is generated, it is then row-normalized with a row sum of one.

Table 1 presents the model estimation results. A highly significant Moran I test statistics indicates a strong spatial autocorrelation. When the spatial lag terms are introduced in the model, the spatial dependence is removed from the residuals as suggested by the insignificant LM test statistics. In the meanwhile, the AIC for SDM is lower than the OLS model, which suggests that the spatial specification improves the model fit.

Of most importance, the Wald test statistics and the *p*-value for $W * Y$ indicate that the spatial autoregressive term is significant. The positive sign of $W * Y$ implies a complementary effect of consumer rating between neighbouring hotels. This result supports the hypothesis that there is a positive spill-over effect on hotels' performance over neighbouring hotels in a city. When the spatially weighted average of consumer ratings of neighbouring hotels increases by one point, the consumer rating of a given hotel tends to increase by 0.442 points. The potential reason is that the online consumer reviews for a hotel generate WOM effects not only on 'my' hotel, but on the hotels located in the surrounding area as well.

Table 1 Global model estimation

Variable	OLS	SDM			
		Estimate	Direct effect	Indirect effect	Total effect
Constant	1.952*** (0.179)	−2.057** (1.032)			
Star	0.423*** (0.033)	0.343*** (0.032)	0.347***	0.715***	1.062***
Price	0.001*** (0.000)	0.003*** (0.000)	0.003***	−0.009***	−0.006***
Service	0.486*** (0.021)	0.467*** (0.020)	0.469***	0.559**	1.028***
W * Star		0.249 (0.169)			
W * Price		−0.006*** (0.001)			
W * Service		0.107 (0.160)			
W * Y		0.442*** (0.129)			
σ^2		0.251			
N	689	689			
Log likelihood		−502.915			
AIC	1096.6	1023.8			
LM		0.502			
Wald		11.806***			
Moran I	0.179***				

Notes *** denotes significance at the 0.01 level, ** at the 0.05 level, and * at the 0.10 level. The values in parentheses are standard errors. σ^2 denotes the variance of residuals. LM refers to the LM test statistics for residual autocorrelation. Wald refers to the Wald test statistics on $W * Y$. Moran I refers to the Moran I test statistics for spatial autocorrelation

In both the OLS and the SDM models, the median room price significantly contributes to the overall user rating of a hotel. This finding is consistent with the expectation that when the price level of a hotel increases, more funds are likely to be invested in facilities and human resources which eventually improve the consumer experience. While the star rating and the rating of service quality are traditionally regarded as good indicators of a hotel's performance, this study further confirms this finding. However, as a spatial dependence is detected, it is necessary to capture the spatial spill-over effects of these variables. The lagged terms in the SDM suggest that the interdependence of room price is statistically significant while the spatial effects of star rating and service rating are non-significant. The negative sign of W * Price indicates a competition effect on room price between hotels. This finding derives an interesting dilemma that increasing room price would improve the consumer experience of a hotel (as illustrated by relationship *a* in Fig. 2), yet on the other hand decrease neighbouring hotels' consumer rating (relationship b) and

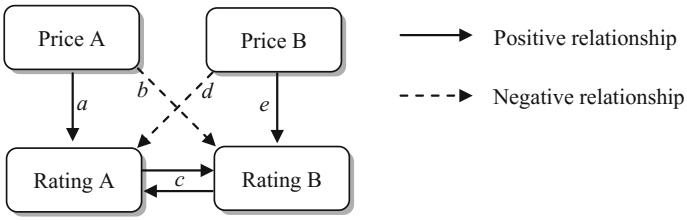

Fig. 2 Relationships between room price and consumer rating of hotels A and B

eventually decrease this particular hotel's performance through the feedback loop (loop *c* in Fig. 2).

Due to the existence this spatial feedback loop, LeSage and Pace (2009) propose measures to gauge the direct, indirect and total effects. The direct effect captures the average influence of changing an explanatory variable on the dependent variable, including the feedback effects through neighbours and back to the focal observation. The indirect effect can be interpreted as either the average impact of changing an explanatory variable of the focal observation on the dependent variable of all the other observations, or the impact from the change of an explanatory variable of other observations on the dependent variable of the focal observation. The total effect is the sum of direct and indirect effects, measuring the impact of changing an explanatory variable of the focal observation on the dependent variable of all the observations in the sample.

Accounting for this feedback effect, the ultimate direct effect of price is significant and positive (as shown in Table 1), which implies that the positive contribution of price (as denoted by relationship *a* and loop *c* in Fig. 2) eventually outweighs the negative spill-over effect (relationship *b* through loop *c* in Fig. 2). On the other hand, when a price rise takes place at neighbouring hotels, the negative spill-over effect (relationship *d* and loop *c* in Fig. 2) appears to be stronger than the positive feedback effect (relationship *e* through loop *c*), which results in a negative indirect effect. The price rise at neighbouring hotels can be effectively regarded as a price drop at the focal hotel, which has the same effect as lowering the room price of a hotel. This finding suggests that travellers tend to consider the relative room price as an indicator reflecting their experience staying in a hotel. Combining both the direct and indirect effects, the total effect of room price is significant and negative.

As shown in the last three columns of Table 1, although the coefficients of star rating (*W* * Star) and service rating (*W* * Service) are non-significant, both explanatory variables have significant spatial effects. This finding suggests that the overall consumer rating of a hotel is significantly and positively associated to its own star rating and service rating, and also significantly and positively associated with the star rating and service rating of neighbouring hotels.

As far as the consumer rating is concerned, it can be concluded from the above findings that on average, there appears to be a competitive effect in terms of the

room price. In the meanwhile, the performance of hotels in London are complimentary on consumer rating, star rating and service rating. Hotels tend to be spatially clustered with a similar score of user ratings, and mutually influential by the performance of neighbouring hotels through the spill-over of WOM effects. Accounting for the feedback loops, the star rating, room price and service quality of a hotel all significantly and positively contribute to its own overall consumer rating. Their indirect spatial effects are all significant as well, but the room price has a negative effect on neighbouring hotels' consumer rating. It is also found that the relative room price of a hotel is associated with the perceived hotel performance.

4.2 Local Estimation

The global estimation above outlines the average effects across all the observations in the sample. However, it would be useful to provide diagnostic information for the industry to pinpoint the local effects for a given hotel. A set of coefficients are estimated for each of the hotels in the sample, which can be used to device competitive strategy for a given hotel. This section demonstrates such a process.

The key to the local estimation is the specification of the local spatial weight matrix $U(i)$, which involves the selection of kernel function and bandwidth. The kernel function controls the shape of the distance delay effect, and the bandwidth controls the smoothness of the delay. A bandwidth that is too narrow may result in large or even unrealistic variations in parameter estimates. While a very wide bandwidth may generate estimates with little variations, it does not represent the local conditions. Therefore, it is essentially a trade-off between variance and bias. Based on the AIC, a Gaussian kernel function with an adaptive bandwidth is chosen for the GWR. The local estimation is a process to estimate Eq. (2) for each of the hotels in the sample, which generates 689 sets of coefficients in total. The minimum, quartiles, and the maximum values of each coefficient across 689 hotels are summarised in Table 2.

Table 2 Summary of local estimates

Variable	Minimum	1st quartile	Median	3rd quartile	Maximum
Intercept	−14.160	−3.801	−2.253	1.258	34.160
Star	0.094	0.225	0.302	0.342	0.482
Price	0.001	0.003	0.003	0.004	0.009
Service	0.320	0.422	0.473	0.502	0.593
W * Star	−0.539	−0.044	0.139	2.569	10.940
W * Price	−0.023	−0.007	−0.006	−0.004	0.002
W * Service	−1.381	0.164	0.462	2.034	8.948
W * Y	−12.580	−3.289	0.197	0.521	1.279
Local R^2	0.699	0.786	0.802	0.826	0.863

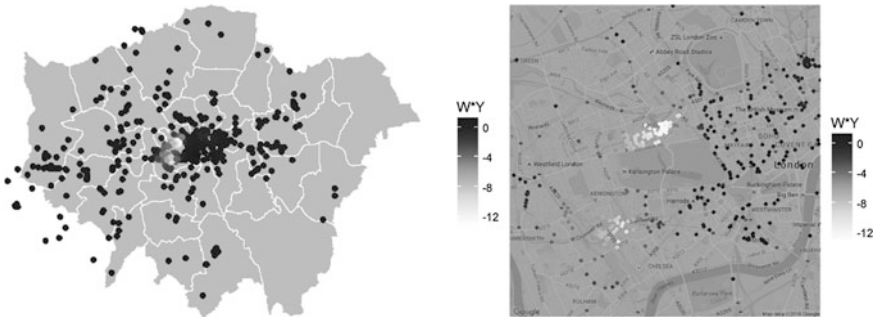

Fig. 3 Local spill-over coefficient of consumer ratings

It can be found from the results that the spatial dependence does exhibit various degrees of variations across hotels. In particular, the own coefficients of star rating, room price and service rating have a positive sign across all the hotels in the sample. While the spill-over effects (W * Star, W * Price, W * Service, and W * Y) all span from the negative region to the positive side of the spectrum, the range of local R^2 indicates a good model fit across the hotels.

As a diagnostic tool, the visual presentation of the local estimation would be most intuitive. Figure 3 maps the spatial variations of the spill-over coefficient of overall user rating (W * Y) across the observed hotels in London. It appears that the spill-over effects are mostly positive which is consistent with the global estimation. However, the areas to the north and southwest of Hyde Park displays a negative pattern. Local knowledge suggests that the hotels in the areas are mainly budget hotels. A competitive effect seems dominant among those hotels while the luxury hotels are more likely to benefit from a complementary effect. Due to the space limit, the results for other variables are available upon request from the authors.

5 Conclusion

This paper provides important contributions to theoretical and practical aspects. This research makes the first attempt to apply the spatial econometric modelling at organizational level in the tourism and hospitality context. It allows researchers to identify and estimate the significance of spill-over effects in hotel performance (or guest experiences) with consideration of online word-of-mouth and room prices. More importantly, the findings from the spatial relationships suggest that hotel managers need to fully recognise the positive and negative spill-over effects from neighbouring hotels when understanding their performance. That is, it stresses the importance of regional marketing that collaborate the promotion strategy closely with complementary hotels based upon geographical proximity.

Furthermore, considering a large sample analysed in this study, the local estimation provides useful diagnostic information for the industry to formulate the competitive strategy. That is, the findings about spatial variations of the spill-over effects would enable the hotel managers to recognise the range of geographical zones for recognising the strategic responses to the changes of online reviews in own hotel.

While this study employs a comprehensive approach, there are some limitations. For example, while the local estimation is based on a trade-off between the sub-sample size and parameter variability, the local results should be interpreted as variations around the global level with reference to the global estimation (Wheeler & Tiefelsdorf, 2005). Accordingly, it is recommended for future research to conduct spatiotemporal models which can be used to capture the temporal effects in addition to the spatial ones as well as to understand the dynamic process of the spill-over effects.

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Assessing the Performance of a Tourism MOOC Using the Kirkpatrick Model: A Supplier's Point of View

Jingjing Lin and Lorenzo Cantoni

Abstract This paper presents the evaluation methods and results of a pilot tourism MOOC (Massive Open Online Course) called *eTourism: Communication Perspectives*, based on the Kirkpatrick model. It assigned twelve indicators to the model's four levels of evaluation (reaction, learning, behaviour, results). Indicators include: self-efficacy and motivation, satisfaction, relevance, course performance, collaborative learning, higher-order learning, reflective and integrative learning, skills development, post-course practices, corporate social responsibility, public relations, and marketing. With various measurement tools such as pre-, in- and post-course surveys, post-course interviews, and analytics data by the host platform, the paper explains the available data with the twelve indicators and provides meaningful performance assessment for the MOOC. Results show that the MOOC was successful in all four levels according to the twelve indicators. The limitations and the future directions are also discussed at the end of the study.

Keywords MOOCs · Massive Open Online Course · Kirkpatrick model · Tourism

1 Introduction

Imagine a scenario: your Massive Open Online Course (MOOC) was finished and uploaded online; you shook hands with team members and popped a champagne together, thinking the work was done. Think twice. As suggested by Rodrigo, Read, Santamaría, and Sánchez-Elvira, (2014), since MOOC delivery has become an innovative part of modern education it should also undergo the same type of quality assurance as other eLearning courses. After all, you as a supplier need to know

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whether your MOOC is a success or a failure, worth of a second run or not, demanded or ignored by the online learners, perfect or insufficient in contents.

In 2015, a total of 1,800 new MOOCs were announced online adding the number of MOOCs in the world to 4,200 from over 550 universities; meanwhile, the total number of learners who signed up for at least one MOOC had crossed 35 million (Class Central, 2015). A shocking fact was that between 2012 and 2015, out of 4,745 peer reviewed publications about MOOCs, only 26 papers covered extensively the issue of their quality assessment (Gamage, Fernando, & Perera, 2015). With so many MOOCs produced, the evaluation of such supplies undoubtedly remains in the early stage in the literature.

The settings of hospitality and tourism uncovered a similar situation as above. A preliminary analysis (Lin, Kalbaska, Cantoni, & Murphy, 2016) identified a total of 51 MOOCs between 2008 and 2015, with 23 of them being provided by universities. In the existing literature, only a few MOOC studies focused on hospitality and tourism, with even fewer dedicated to MOOC evaluation (Murphy, Tracey, & Horton-Tognazzini, 2016; Tracey, Murphy, & Horton-Tognazzini, 2016).

This research aimed to answer the following three questions: (1) how to evaluate the performance of a MOOC using the Kirkpatrick model? (2) what indicators can be included during such a process? and (3) is the selected MOOC successful according to the relevant evaluation criteria?

The methodology of this study took a further step, compared to the previous studies related to MOOC evaluation in hospitality and tourism settings, by introducing specific indicators and practical measurements. Results can potentially benefit the future MOOC suppliers when they evaluate the effectiveness of a MOOC of their own.

2 Literature Review

2.1 MOOC Evaluation

Evaluation can be on different scales and aspects based on various purposes as displayed in Table 1. How to evaluate a MOOC stays an open question and there is no agreed model for conducting MOOC evaluation.

Regardless of different formats of evaluation, in its essence quality is very much the condition that determines how effective and successful learning can take place (Creelman, Ehlers, & Ossiannilsson, 2014). Therefore, measuring the learning inside a MOOC is a critical factor concerning quality. However, due to the mass scale of global audience, MOOC as an innovative educational movement is destined to hold much more dynamic characteristics than a traditional face-to-face class. Downes (2013) claims that the success of a MOOC is process-defined rather than outcomes-defined, and that it should be seen as a vehicle for discovery and experience. Thus, the evaluation mechanism for a MOOC should ideally adopt

Table 1 Evaluation of MOOCs: cases, aspects, and literature

Evaluation cases	Evaluation aspects	Literature
A single MOOC: overall	Critical thinking skills	Poce (2015)
	Participants' perspectives on MOOC	Cross (2013)
	Learner engagement	Parra (2016)
	Learner motivation	Douglas, Mihalec-Adkins, Hicks, and Diefes-Dux (2016)
	Usability and effectiveness of the blended mode	Yousef, Chatti, Schroeder, and Wosnitza (2015)
A single MOOC: a component	Learning analytics module	Yousef, Chatti, Ahmad, Schroeder, and Wosnitza (2015)
	Discussion forum	Onah, Sinclair, and Boyatt (2014)
Multiple MOOCs	Design quality of moocs	Khalil, Brunner, and Ebner (2015), Rodrigo et al.(2014)
	ICT tools in for teaching	Lesjak and Florjančič (2014)

multiple sources of data to enhance its capability of various cases inclusion, rather than simply considering the completion rate.

In the hospitality and tourism field, defining MOOC failure or success remains a tricky issue (Murphy et al., 2016). Tracey et al (2016) recommended using the Kirkpatrick model as a comprehensive framework to evaluate MOOCs in applied tourism and hospitality settings. They suggested including: self-efficacy beliefs into level 1 criterion, higher level of learning into level 2, participant engagement, participant persistence, pre- and post- course performance comparison into level 3 and cost-benefit model, linking customer engagement and performance outcomes into level 4. However, this brief framework was only a conceptual proposal and they did not apply it to practically evaluate any MOOC. A similar effort was found in another research (Lin, Cantoni, & Kalbaska, 2016), which tried to apply the Kirkpatrick model to evaluate a MOOC by proposing indicators.

2.2 The Kirkpatrick Model

The Kirkpatrick model was first introduced by Donald Kirkpatrick in 1954 and became the worldwide standard for training course evaluation after his best-known work *Evaluating Training Programs* (Kirkpatrick, 1975). The model has long been considered one of the most influential models for any kind of training course, formal or informal. Kirkpatrick's model (1994) delineates four levels of training outcomes that successively build upon each previous one: reaction, learning, behaviour, and results. The first three levels examine the effectiveness of training, on individuals while the fourth one explores that at the organizational level.

Level 1: Reaction. Reaction was originally used to describe how much participants liked a particular training program and the term evolves along with time to assess trainees' affective responses to the quality (e.g., satisfaction with instructor) or the relevance of training (e.g., work-related utility) (Bates, 2004).

Level 2: Learning. The degree to which participants acquire the intended knowledge, skills, attitude, confidence and commitment based on their participation in the training (Kirkpatrick Partners, 2016). Measuring learning is important because changes in behaviour cannot occur if learning has not taken place (Bradley & Connors, 2007).

Level 3: Behaviour. Behaviour outcomes address either the extent to which knowledge and skills gained in training are applied on the job or result in exceptional job-related performance (Bates, 2004). Essentially, this level's evaluation explores what the individual participants did or did not do once returning to jobs (Bradley & Connors, 2007). It is more challenging and costly to conduct than previous two levels because the involved factors are difficult to be measured directly.

Level 4: Results. The degree to which targeted outcomes occur as a result of the training and the support and accountability package (Kirkpatrick Partners, 2016). At this level, it shifts the analysis from changes observed in individuals to the impact on the organization (Bradley & Connors, 2007).

3 eTourism: Communication Perspectives

The MOOC to be evaluated by this study is *eTourism: Communication Perspectives*, which was a pilot MOOC provided by *Università della Svizzera italiana* (USI) from Switzerland. First launched on October 5, 2015 on the German MOOC platform iversity (http://www.iversity.org), it has lasted for eight weeks with eight chapters of contents. English was its instruction language and the estimated study hours were three to four per week. Eleven staff supported the development. Four instructors and three assistants were collaboratively working on its delivery. This MOOC contained 17 lecturing videos (usually each week one theory video and one case video), 17 video scripts, 16 quizzes matched with videos, eight content-based discussion forums, eight lists of further readings, 21 course announcements, one engagement survey, two platform-generated surveys, one Facebook group, one Twitter hashtag. Learners in the Certificate Track, who paid 49 euros, were able to take the final online written exam, COA exam, any day any time in the given exam period. The exam included 30 multiple choice questions. If the learner passes the exam, she/he will receive a Certificate of Accomplishment with his/her grade on it.

The MOOC attracted the attention of 5,519 global learners from 142 countries. By the end of the course, 7.1% learners completed at least 80% of the course and received a free Statement of Participation.

The completion rate of 7.1% in this MOOC lingers in the rage of 5–10% found by other studies (Jordan, 2014; Khalil & Ebner, 2014). If measured by the traditional standard of education success, critics may consider this a failure. However, as aforementioned the completion rate is only one small piece of the iceberg and establishing relevant success measure is critical to organisations adopting and subsequently implementing MOOCs (Murphy et al., 2016).

4 Evaluation Methodology

The evaluation of this MOOC sought to review the course data by assigning twelve indicators to the Kirkpatrick model, which were adapted to the need of the evaluation. Multiple sources of data were utilized for evaluation. The host platform provided results from their pre-course survey, post-course survey, as well as course analytics data. In the fifth chapter of this MOOC, an engagement survey was delivered to participants for responses. Meanwhile, individual post-course interviews were invited among the respondents who participated in the engagement survey activity. For the social media consumption data, they were directly retrieved from the involved social media tools Facebook and Twitter. All the data were retrieved after the MOOC went offline. The number of respondents can be found in Table 2.

5 Results

5.1 Reaction Layer

Self-efficacy and motivation. Most learners initially held high level of self-efficacy concerning their ability to dedicate time and complete this course. For example, 80% of them intended to spend 1–5 h on this MOOC. Nearly 87.5% of them planned to finish all or most of the provided lecturing videos. 81.7% considered completing all or most of the course assignments (homework, quizzes, and exam).

Three major reasons encouraged the participants to enrol in this MOOC: personal curiosity, supporting current job responsibilities or company's line-of-business, and being useful for obtaining a new job. The impact of the institute, the instructor, and the friend in the MOOC were found to be little in such decision. Over 82% claimed that

Table 2 Evaluation methodology based on the Kirkpatrick model

Kirkpatrick model aspects	Indicators	Literature basis	Measurements	No. of respondents
Reaction	Self-efficacy and motivation	Douglas et al. (2016), Tracey et al. (2016)	Pre-course survey (9 questions)	477
	Satisfaction	Kirkpatrick (1975)	Post-course survey (3 questions)	114
	Relevance	Kirkpatrick (1975)	In-course engagement survey (1 question)	216
Learning	Course performance	Kirkpatrick (1975), Tracey et al. (2016)	In-course analytics data: video views; number of posts in forum; quizzes; CoA exam attendance and grades	5,519
	Collaborative learning	Wintrup, Wakefield, and Davis (2015); Tracey et al. (2016)	In-course engagement survey (2 questions)	216
	Higher-order learning		In-course engagement survey (5 questions)	216
	Reflective and integrative learning		In-course engagement survey (5 questions)	216
	Skills development		In-course engagement survey (8 questions)	216
Behaviour	Post-course practices	Kirkpatrick (1975)	Post-course interviews	9
Results	Corporate social responsibility	Self-developed indicators	Number of subscribers from developing countries and unlikely-to-attend-physical-class groups	Refer to Sect. 5.4 of this study
	Public relations		Visibility of USI in positive contexts: such as number of total subscribers, and media exposure rate (Facebook, Twitter, YouTube); New collaborative projects or materials being reused by others	
	Marketing		Number of new admissions at campus due to the MOOC	2

taking this MOOC was mostly due to the consideration of their professional life or academic life.

Satisfaction. Among 114 respondents to the satisfaction question, 71.9% chose "very satisfied", 22.8% selected "somewhat satisfied", and others responded as: neutral (2.6%), somewhat dissatisfied (1.7%), and very dissatisfied (0). The satisfaction rate reached 95.0%. Besides the high level of satisfaction, 88.5% expressed the willingness to take more courses from the same instructors and nearly 86.0% of them were positive about recommending this MOOC to their friends.

Relevance. Out of 216 respondents of the engagement survey, 93.6% found the given resources in this MOOC useful and relevant (very often: 54.2%, often: 39.4%, sometimes: 6.9%, never: 0).

5.2 Learning Layer

MOOCs are often heavily based on lecturing videos. These videos, instead of traditional textbooks, become the core medium for knowledge acquisition in MOOCs. The video views of eTourism MOOC continuously dropped over weeks (Fig. 1). The views of theory videos on average decreased from 3,575 views in the first week to 486 views in the final week. Throughout the course, theory videos were in general more popular among learners than the case videos. This difference was more obvious before the fifth week, after which the views on both videos simultaneously decreased.

Nine chapter-based discussion forums in this MOOC provided valuable channel for the participants to communicate with the instruction team and other learners. At the same time, they produced new valuable contents for the course. The first forum invited learners to do self-introduction as a warm-up activity. The remaining eight discussion activities were designed as homework to examine the understanding of learners on each given topic. Learners were required to post their answers to the given tasks in the forums. As shown in Fig. 2, the participation rate in finishing homework declined over chapters. The high level of engagement with the forums

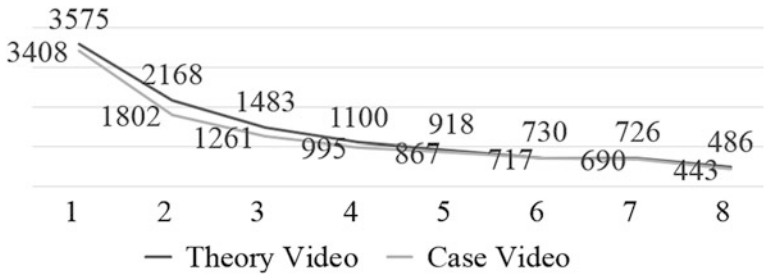

Fig. 1 Video views by chapter/week

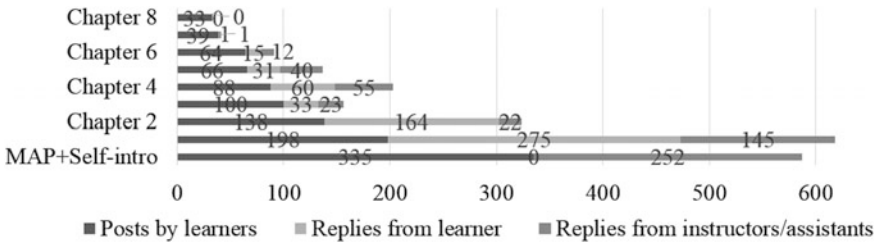

Fig. 2 Post numbers by chapter

were found in the first four chapters, with active posting and replying from both learners and instruction team. In the final two chapters, the facilitation from the instruction team stopped because of a sudden technical change in forums on the host platform side, which disabled instructors or assistants to reply to learners' posts.

The quizzes data was not usable by instructors in this MOOC, majorly due to the settings of the host platform. Learners were able to have multiple tries in all the quizzes' questions until they reached the right answer. And in the analytics data provided by the host platform, was always simply displayed as 100% success for each quiz. Therefore, the quiz data was not much of a help in this study.

For the CoA exam, although there were eighty learners who were registered, only 37 ones completed it and obtained the Certificate of Accomplishment. The average grade reached 25.4 (out of 30.0) and the lowest score was 17.0 (1 out of 37).

Collaborative learning. Out of 216 respondents in the engagement survey, approximately 78.3% never asked another learner for help to understand course materials, and 64.2% of them never explained course materials to others.

Higher-order learning. Most participants agreed that their higher-order learning was achieved well through this MOOC. Over 90% stated that they were able to memorise course content, apply facts, theories, or methods to new situations, analyse ideas or theories in depth by examining their parts, evaluate or judge a point of view, decision, or information source. Nearly 98% formed a new understanding from various pieces of the course by different levels: some (20.8%), quite a bit (40.7%), very much (36.1%).

Reflective and integrative learning. Over 80% of the 216 participants at least sometimes or more (often, very often) were involved in the following learnings: connected their learning to societal problems or issues (80.6%), examined the strengths and weaknesses of their own views on a topic or issue (88.4%), tried to better understand someone else's views by imagining how an issue looks from his or her perspective (90.7%), learned something that changed the way they understood an issue or concept (94.0%), and connected ideas from the course to prior experience and knowledge (94.4%).

Skills development. On average over 90% claimed that they developed—some, quite a bit, or very much—the following skills: thought critically and analytically (94.9%), became an independent learner (94.0%), were innovative and creative (89.8%), developed or clarified personal values (90.3%), understood people of other backgrounds such as economic, racial/ethnic, political, religious, nationality, etc. (91.2%). Meanwhile, more than 76% agreed that in at least some parts of this course they wrote clearly and effectively (83.8%), analysed numerical and statistical information (75.9%), acquired job or work-related knowledge and skills (83.8%).

5.3 Behaviour Layer

All the interviewed learners (nine in total) expressed that eTourism MOOC was their first MOOC experience and it was so positive that they would like to continue the MOOC experience in the future. A coach from Panama discovered the opportunity of delivering education to African people via mobiles after finishing one homework about evaluating a mobile app, which was developed to educate African youth concerning world heritages preservation in Africa. He said:

> One of the things that brought at first on my mind, well, the colours, the look, the feel, were not what I expected. However, I found out that people in Africa they are stunning on mobile devices. Now I am connected to a company who will deliver some education to mobile… For me, it was mind changing that we should not think about only locally, like perhaps the world is obviously similar everywhere. We should take advantage of the whole global economy rather than just local or regional.

Another interviewee had finished master level of education in tourism when taking this MOOC and said that this MOOC delivered very practical experience, which triggered more learning opportunities for her.

> [Because of this MOOC,] I finished Ticino Travel Specialist eLearning course and found out a lot more about online education. Now I am studying something from Paris and Hong Kong travel specialists. That is something really good that I can practice all my life after this MOOC. So it was very practical.

A French interviewee served as a coordinator of the promotion service in a destination management organization, specialized in media relations. She shared her experience of a cross-sector collaboration because of the influence of this MOOC.

> I had a discussion with a colleague who was taking care of the eTourism reputation for [Ddestination X] tourism. She said to me I don't know what to do on twitter for the [Ddestination X] tourism, can you help me? I was then following the course and said ok we can try. And I will take that account for press, tour operators and tour players. So she said ok I will let you take care of the Twitter account for [Ddestination X] tourism. It helped me to go from one subject to another inside and even outside the team, better communication and collaboration.

5.4 Results Layer

Corporate social responsibility. A total of 1,817 participants from 51 developing countries (based on United Nations sources) were attending this MOOC. 339 of them had at least 5% progress in taking the course. Five of them passed the final CoA exam and received Certificate of Accomplishment and they are from Serbia (2), Côte d'Ivoire (1), India (1), and China (1). The top five developing countries where participants were from included: Philippines (308), India (2190), Bangladesh (162), Pakistan (151), and Kenya (95). Besides the coverage of developing countries, another indicator is the number of participants who were not students. According to the demographic survey results, there were 428 non-students, accounting for nearly 70% of the responses. There were more female learners (62.1%) than male learners (37.9%). The majority of learners were of 26–46 years old (82%). The detailed age distributions can be found in Fig. 3.

Public relations. When the MOOC went offline, it attracted 5,519 subscribers. Compared to other hospitality and tourism MOOCs, it was the most active MOOC in cultivating social networking channels for better communication (Lin et al. 2016). It had 887 members on its Facebook group and the number is still growing. The course hashtag *#eTourismMOOC* on Twitter received hundreds of tweets under this topic with the potential reach of 20,700. The trailer video of this MOOC received 7,630 views. Besides the social media exposure, this MOOC was also reported in the mass media channels (such as Il Sole 24 ORE, Skopje, and teleticino) and multiple websites (such as academic-future.com, or wn.com).

Meanwhile, the MOOC's materials were being reused by other universities including Universite Sorbonne (univ-paris1.fr), CETT-UB Campus de Turisme, Hoteleria i Gastronomia (www.cett.es), University of Barcelona (www.ub.edu), and National Research University Higher School of Economics (https://www.hse.ru/en/).

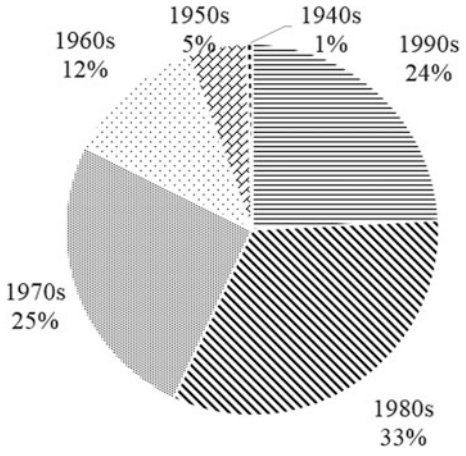

Fig. 3 Number of participants by age group (out of 645 responses)

Marketing. Because of the MOOC, the exposure and reputation of the university and its relevant tourism related programs got enhanced. One direct impact was that enrolled participants moved from online classroom to face-to-face classroom at campus. According to the admission office of USI, at least two new admissions were directly generated from the eTourism MOOC as indicated by the required survey.

6 Discussions

The Kirkpatrick model's four-level evaluation criteria provided a systematic and effective way to assess the performance of this MOOC as an online training program. Firstly, learners' reactions were dominantly positive regarding motivation before the course, satisfaction after the course, and relevance of the course. Secondly, during the course, it was discovered that the participants' performance dropped along with the progress. A lot of them ceased the course, based on the statistics of the video views and post numbers. However, most of them still held positive attitude to their learning achieved through the MOOC considering the fact that they highly rated their performance in aspects of collaborative learning, higher-order learning, reflective and integrative learning, and skills development. Thirdly, the MOOC opened a new gate to the education for the masses and they confirmed with their own post-course practices that this opportunity encouraged them to carry on with more similar learning experiments online, apply acquired knowledge and skills into daily job and earn new chances at work, and obtain a refreshing view of the global economy by breaking through the local or regional perspectives. Lastly, this MOOC not only helped different individuals enjoy the course and get better in learning or behaviours, but also fed back the three drivers of the provider, *Università della Svizzera italiana*, by serving people from developing countries and at-job workers to develop new skills and update knowledge, created new channels of communications through public promotions in different media sources, and admitted new students to the at-campus academic programs. Overall, *eTourism: Communication Perspectives*, as a pilot MOOC, was considered a success according to the four layers from Kirkpatrick model with twelve indicators assigned in this study.

Besides the evaluation results, two more results about MOOC learners are worth of attention. Based on the fact that over half of learners were non-students and one major purpose for taking the MOOC was connected to professional life and academic life, it was clear that besides fulfilling curiosity, MOOCs also became a tool for adults to seek further education or on-job trainings. With such a precise learning purpose, however, learners displayed an excessive amount of optimism in their learning efficiency on this MOOC. As discovered, the majority of learners set the original goal as finishing the course, but the completion rate of this MOOC actually only reached 7.1%. One important factor underestimated by these learners obviously was the time per se. It seemed that most learners scheduled only 1–5 h for a

course of expected 16–24 h' time commitment. On one hand, it revealed the short tolerance of online learners to the length of the MOOC. On the other hand, it hoisted an alert for MOOC designers that when developing a MOOC, the time commitment should be set carefully in order to provide a more practical learning experience for online learners.

Another interesting finding was that learners were more willing to participate in internal activities mainly discussion-based ones in forums, rather than external activities posted on other social media channels such as Facebook or Twitter. Hereby the border between internal and external activities is set by the criteria of inside or outside the host platform. This finding aligned with the results from previous studies (Alario-Hoyos, Pérez-Sanagustín, Delgado-Kloos, Munoz-Organero, 2014). The drawbacks of the absence of social networking communities related to a MOOC is that the learners from different periods of attendance cannot communicate with each other, and when the MOOC is over there will be no further communication among the participants even if they are from the same period. The advantage of having all communications within the platform is that it can reduce the information overload for both teachers and learners (Lin et al., 2016).

The limitations of this study are threefold. The indicators assigned to the Kirkpatrick model is self-developed and experimental. Another one is that the relationship among different indicators remained unknown in this study. Thirdly, this study provided a brief evaluation of the whole MOOC, not only as a course but also as a project within the institution; however, there were much more details to explore considering the large amount of available data.

7 Conclusions

The Kirkpatrick model is a widely used model for training evaluation. This paper presented the methodology to assess the performance of a Swiss tourism MOOC, *eTourism: Communication Perspectives*, by adopting the Kirkpatrick model. A total of twelve indicators were proposed under the four levels of the original model. Multiple sources of data were used to measure the indicators. The eTourism MOOC was evaluated to be successful, with high number of motivated and satisfied learners, who claimed to have achieved effective learning through the MOOC. The follow-up interviews also revealed positive influence of the MOOC on job-related practices, personal value and learning behaviour changes. The supplier, *Università della Svizzera italiana*, benefited from the production of this MOOC in respect of corporate social responsibility, public relations, and marketing.

One future research direction can be to in-depth investigate the different surveys inside this MOOC, in particular the engagement survey, to understand better about the potential relationships among indicators that have been omitted by this study. Another suggestion is to validate the current indicators and explore more indicators to support the approach of using Kirkpatrick model to conduct MOOC evaluation, and when possible to validate the proposed framework of indicators.

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Part III
Smart Destinations and Big Data

Strategic Visitor Flows (SVF) Analysis Using Mobile Data

Rodolfo Baggio and Miriam Scaglione

From *flows of power* to the *power of flows*.
Castells (1989)

Abstract 'Visitor flows' (VF) is defined as the generalized spatial movement patterns of travellers and have always been relevant in tourism studies. Nowadays, VFs are important for understanding *travel networks* which go beyond the specific spatial dimension to include informational or virtual dimensions such as travellers experiences. Travel network modelling is not only a valuable marketing tool helping to increase value in the supply chain but also it challenges the traditional organization of destination management organizations (DMO's). DMO's have to reshape their governance model from a static-central model to a dynamic network; destination managers have to change from *flows of powers* to *power of flows* (Castells, 1989). VF in this broader picture moves from merely descriptive to strategic VF (SVF). The aim of this research is to show empirical evidence of SVF in the Fribourg region in Switzerland by exploiting mobile phone data.

Keywords Spatial movement patterns of travellers · Network models · Mobile phone data

1 Introduction

The monitoring of visitor flows (VF), namely the general or aggregate patterns of movements in a given area, not only sheds some light on the most and least visited places but also gives relevant information about demand segmentation (Orellana, Bregt, Ligtenberg, & Wachowicz, 2012: 367). Seminal research last century has shown the relevance of the spatial dimension in market segmentation (Dredge, 1999; Gunn, 1994; Lue, Crompton, & Fesenmaier, 1993) and confirmed the net-

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work nature of this approach (Leiper, 1990). Nevertheless, empirical research was difficult because of the lack of appropriate data describing these patterns (Leiper, 1989).

In the twenty-first century, the research agenda of network studies in tourism has sought to overcome the spatial dimension (i.e. geo-localisation aspects) and take into account virtual dimensions, referred to as *travel networks*. Evidence showing this virtual dimension consists of the following: Firstly, travellers are creators and co-creators of the information contained by networks which support travel planning; secondly, travellers share their experiences in community-based space and finally, technologically supported networks are ubiquitous meaning that the information can be found before, during and after the trip (Stienmetz & Fesenmaier, 2013; Pan & Fesenmaier, 2006; Wang & Fesenmaier, 2004; Wang & Xiang, 2007; Zach & Gretzel, 2011; Zheng, Wöber, & Fesenmaier, 2008). The concept of destination is also affected by this traveller network conception. Physical and virtual elements both contribute to the creation of value and also make the analysis of the whole value system more difficult (Stienmetz & Fesenmaier, 2013).

Moreover, in the tourism sector, the process of disintermediation (Buhalis & Law, 2008) and re-intermediation in the distribution of tourism services (Kracht & Wang, 2010) has increased the complexity of the business structure (Stienmetz & Fesenmaier, 2013); one example of this is distribution channels (Scaglione & Schegg, 2015; Schegg & Scaglione, 2013).

As a result, a shift of information and decision centrality into placeless and timeless networks has been observed, and also happens in other sectors. *Organisations* are changed to *flows*, these latter become the units of work, decision and output (Castells, 1989: 142). "Thus, the dialectic between centralization and decentralization, the increasing tension between places and flows, could reflect, in the final analysis, the gradual transformation of the *flows of power* to the *power of flows*".

The concept of Destination Management Organisations (DMO's) articulated in the early 70's as a comprehensive and static system has failed, at least in the last three decades. The failure cycle is described by the impossibility of traditional DMOs to reconcile three different logical systems: territorial, business and travel experiences (Beritelli, Bieger, & Laesser, 2014). A destination value system is composed as a set of four different but overlaying networks: the marketing and promotion level, experience design level, partnership configuration and sales & distribution (Stienmetz & Fesenmaier, 2013).

This research focuses on the aspects of travel networks and the spatial dimension. The main aims are twofold. On the one hand, to show the utility of mobile data in grasping generalized patterns of tourist movements in the canton of Fribourg, Switzerland, and on the other hand, to show methodological approaches that seem to be appropriate in a Big Data environment to solve problems based on network metrics.

The paper is organized as follows. The following section is the literature review which will give an overview of the typical elements of space location patterns in relation with the mathematical theory of networks, then the families of

space-location data used in empirical research. The third section describes the data; the fourth section presents the results of the network analysis and after this comes the conclusion, which presents limits and gives a future research agenda.

2 Literature Review

2.1 Visitor Flow Elements

The concept of multi-destination trips has enlarged studies taking into account single destination trip models (Lue et al., 1993). The spatial structure theories show that the supply of recreation opportunities could affect the trip experience both in nature and other dimensions (Kim & Fesenmaier, 1990). Thus, the modelling of travellers' spatial patterns becomes relevant. Five prototypical spatial patterns were proposed: the single destination pattern (most activities within one destination), the en route pattern (several destinations visited en route to a main one), the base camp pattern (nowadays called *Hub,* other places visited while at a primary destination), the regional tour pattern and the trip chaining pattern (touring circuit) (cf. Gunn, 1994: 126–127; Lue et al., 1993: 294, Fig. 2). The concepts similar to spatial trip patterns are discussed below.

Firstly, there is the *travel itinerary* by Lew and McKercher (2002) who present a comprehensive comparison table of tourist itinerary models. The basic structure of the travel itinerary pattern is origin-destination-origin where lines are routes in between. The interest of each destination is relative to the whole destination in the itinerary with single destinations and hub and tour patterns; two new concepts are added: *gateway* (the first destination reached before beginning a multiple destination itinerary) and *egress* destination (the last destination visited before going back home).

Secondly, *the linear paths* models aims to "reflect the geometry of tourism movements away from their accommodation point" (Lew & McKercher, 2006: 417). The linear path simplifies the actual spatial movement shaped by geography and is independent of territorial distance and means of transportation. They add a new one to the patterns cited above: the random exploratory path. The travellers following such patterns, which could not be assimilated to any of the others, do not follow a systematic exploratory strategy and they show flexible and opportunistic behaviour.

Another concept close to spatial patterns is *generalized sequential patterns* (GSPs) described as "the sequence in which the places are visited, regardless of the trajectory followed. The term 'generalized' implies a relative order and not an absolute order: GSPs are temporal structures used to find commonalities in the order that places are visited" (Orellana et al., 2012: 673).

Finally, trips representing the multiplicity of city pattern within the United States are modelled as a network, and the most important elements of network theory are employed in the analysis (Hwang, Gretzel, & Fesenmaier, 2006).

The network analysis toolbox turns out to be an appropriate strategy for the analysis of spatial patterns of movements (VF). This approach provides several metrics useful for describing different aspects of the structural and dynamic characteristics of the object of study (Baggio & Del Chiappa, 2016; Baggio, Scott, & Cooper, 2010). Some of the main measurements that allow the characterisation of topology and behaviour of actors, such as VF, are used in our analysis: the distribution of each node connection (degree distribution), the length of the paths connecting any two nodes (in number of links), and the mesoscopic structure of the network (number and type of clusters of nodes). These are better described, along with the results, in Sect. 4.

Tourism attraction system studies, both theoretical (i.e. Leiper, 1990; Lew, 1987) and empirical (Gunn, 1994, ch. 5; Richards, 2002), have also used network concepts. Leiper defined the *tourist attraction system* as "an empirical connection of tourist, nucleus and markers" (Leiper, 1990: 367). Nucleus is the central element of a tourism attraction system, and it could be any feature or characteristics of a place that travellers visit. A marker is the link, namely an item of information that links the human and the nuclear element of an attraction system and allows one to distinguish the nucleus from other similar phenomena. The centrality of the nucleus in the attraction system does not mean that such attractions are isolated elements; the expression *nuclear mix* was coined by Leiper (1990: 374) as a combination of nuclei which are *significant* in the experience during the trip. Nevertheless, there is hierarchical classification of nuclei: primary, secondary and tertiary. This classification mainly relies on the traveller's knowledge of their existence before they arrive at the site or destination. Tourists could suspect the existence of the secondary attraction but probably not of the tertiary ones.

The analysis of time-space consumption gives important knowledge and will help to cluster data in terms of tourist behavioural patterns (Botti, Peypoch, & Solonandrasana, 2008; Grinberger, Shoval, & McKercher, 2014). Leask (2010), in a very complete review of attraction concepts, points out that the term visitor attraction is now preferred to tourism attraction in order to include day-trippers as well.

This subsection attempts to show that the *tourism attraction system*, as was proposed in the 90s has been enriched and updated by the *travel networks* concept. Both are based on a network nature structure, but in the former model, touch points or nodes were mostly identified by their special locations; whereas in *travel networks* touch points could be either physical or virtual—roughly speaking, experiences and informational elements are included. Therefore, describing general spatial patterns of travellers' movements or VF is only part of the story but not the least interesting one, and so is the aim of this research.

2.2 From Traditional Data to Big Data in VF

The study of spatial patterns of movements has used, as primary data, surveys or opinion polls (Hwang, Gretzel, & Fesenmaier, 2006; Lew & McKercher, 2002) which were time-consuming and not very accurate (Vu, Li, Law, & Ye, 2015). Most of the time they are based on information recalled by the interviewees. Another strategy was based on surveys based on diary reports of the trip (Stewart & Vogt, 1997). Exploratory methods were also used, such as expert opinions collected from multiple participant interviews (workshop) in order to individualize attractions and categorize them (i.e. getaway, egress) (Beritelli, Bieger, & Laesser, 2014; Beritelli, Reinhold, Laesser, & Bieger, 2015). All of those methods are rooted in a long academic research tradition and we can call them *small data approaches* (Baggio, 2016).

Different technologies allow the analysis of spatial-temporal visitors. Digital traces obtained via geo-tagged photos on social media (Instagram, Flick, etc.) or mobile apps belong to the family called Volunteered Geographical Information (VGI) which an increasing number of scholars take advantage of for analysing either urban visitor flows (i.e. Kádár & Gede, 2013; Vu et al., 2015). The family of VGI is useful for quantifying elements of the structure of the travel network (Zach & Gretzel, 2011). A recent research shows through empirical elements that VGI approaches seem not to contain biased information (Stienmetz & Fesenmaier, 2016).

'Destination guest cards' having a chip embedded give also insights into intra-destination VF. These cards which tourists obtain from destination management offices allow free or highly discounted access to partner attraction and transportation (Zoltan & McKercher, 2015). Another destination card has been offered to tourists in the canton of Fribourg since 2016, without having a chip but having a mobile app which can constantly be updated by service suppliers (i.e. 'flash offers') (Union fribourgeoise du tourisme, 2015). Analysis made on the first season of data collection gives coherent results when crossed to the results of the present research (Scaglione, Baggio, Favre, & Trabichet, 2016a).

Global Positioning Systems (GPS) are very popular in VF studies but with a small sample of volunteer participants (Birenboim, Anton-Clavé, Russo, & Shoval, 2013). Two others techniques are land-based tracking systems and hybrid solutions that combine the two. Empirical research carried out on volunteers based proved that the three techniques could be effective tools for tracking tourism behaviour even though they show different levels of accuracy (Shoval & Isaacson, 2007).

The use of smartphones has increased in the everyday life of consumers such as when using social networks on mobiles phones (Scaglione, Giovannetti, & Hamoudia, 2015). The increasing importance of mobile devices is also evident during vacation periods (Wang, Xiang, & Fesenmaier, 2016). The capabilities of mobile phone positioning databases has become, therefore, an interesting and pertinent tool for monitoring VF which can enlarge traditional data sources and VGI ones (Ahas, Aasa, Roose, Mark, & Silm, 2008). Two projects were run

contemporaneously in the last years in Europe focusing on passive mobile data use. The first one was a Eurostat project named *Feasibility Study on the Use of Mobile Positioning Data for Tourism Statistics* (Eurostat, 2013). The second was a feasibility project named *Monitour* (Scaglione, Favre, & Trabichet, 2016b) which was financed by Swiss research funds. Both projects had as a main objective to study the feasibility of using moblie phones to increase information about tourism frequentation.

The term *passive mobile positioning data* refers to automatically stored information stored in log files by mobile operators. The mobile geo-localisation information relies on the position of the *cell network*. A cellular network is physically placed at base stations which are usually towers supporting one or more directed antennae. The localisation of the *cell network* is determined by the base station (in the case of only one antenna) or several directed antennae. The size of the cell network is not fixed, depending on the load or number of phones connected, if the network is crowded, phones can switch not to the nearest base station but another one in the neighbourhood, the optimal distance from handset to antenna is less than 60 km (Ahas et al., 2008). Both the Eurostat and *Monitour* projects used the coordinates of the base station as proxy of the location of the mobile, which is to say the geo-localisation of the anonymized visitor (cf. Eurostat, 2013: 18).

The next section describes more precisely the mobile data used in this research.

3 Data

Swisscom, which is the major Swiss mobile provider having 60% of the market is a partner of this research and provided a set of test data.

The data consists of 18,138 anonymized mobile users belonging to one of the top European incoming countries in Fribourg canton tourism. The period under study is 11 days, from 17 and 28 August 2014. For confidentiality purposes, Swisscom has anonymized the users using Hashing-Algorithm techniques and shifting of the date; no characteristics of the users are given. From hereafter we will refer to the anonymized mobile users as AMU. It is worth noting that this anonymization process does not affect the results of this research, whose aim is to show the inference of SVF using mobile data.

The data is comprised of 2G A Interface data, 2G IuPS Interface data, 3G IuCS data and 3G IuPS data, technology which does not allow accurate geo-localization of the mobile position, i.e. it was not possible to associate the data to specific tourist attractions. Thus, the authors used the position of the cells (namely antennas) as proxy for the geo-localization of AMU, and they acknowledged that this is a limitation of this research. There are approximately 1,500 cells.

In order to identify SVF, the authors programmed a customized routine in Java which was run by the computer center of Swisscom in order to yield a file consisting of trajectories. The structure of that file has the following fields: AMU, trajectory identification, time stamp, duration and cell identification. The time stamp

field indicates the moment when AMU was captured by the cell identified in the observation. The duration indicates the period of time that the AMU remained captured by the latter cell, but this data was not used in this first analysis.

The data includes 18,138 trajectories having a mean duration of 3 days and 15 h and a standard deviation of 2 days 14 h. The median number of trajectories per AMU is 13.

4 Network Analysis

The network has been built in the following way. Records were given a unique identifier, *anonymized user id-day*, then the different tracks were extracted. The length of a track is the number of different points (antennas) on the track. We notice here that a time window of one day has been used since we are interested in the daily mobility patterns (n.b.: all positions recorded in one day belong to the same track). The tracks were then combined into a network whose nodes are the antennas and links are all the trajectories (cumulated) followed by people going from one antenna location to another.

The network is directed and weighted (the weight is the number of trajectory segments that connect two locations). Self-loops, that correspond to individuals that spend the whole day in a single location were removed. All scripts were written in Python and analyses used the Python *Networkx* library (Hagberg, Schult, & Swart, 2008), Pajek was used for visualisation (Batagelj & Mrvar, 1998).

The network has 1430 nodes and 21,122 links (13 933 have weight = 1). The average (unweighted) degree is 29.54. The average weighted degree is: 44.92. The network is practically connected (only 14 nodes are isolated). Its density (number of links/max possible no. of links) is 0.01, reciprocity (% of nodes connected bidirectionally) is 0.47. Considering the network unweighted (so considering only how antennas are connected by user trajectories) the average path length (no. of antennas traversed) is 3.2 and the diameter (longest distance between 2 antennas) is 10. The weighted degree distributions (in-degree and out-degree, see Fig. 1) are consistent with a power-law (for the main tail) distribution with parameters (quite similar): In Degree exponent = 2.91 $\pm$ 0.17; Out Degree exponent = 2.97 $\pm$ 0.19 (calculations were made according to Clauset, Shalizi, & Newman, 2009).

Using the idea of a bow-tie structure, i.e. a large connected component, an IN and OUT components with a unidirectional connection, and a disconnected (DISC) component (Broder et al., 2000), we have the following split: connected component (SCC): 97.0%; IN: 1.1%; OUT: 0.9%; other (disconnected nodes): 1.0%.

A second possibility to explore the inner (mesoscopic) structure of a network is that of running a modularity analysis. A software algorithm finds the best set of subnetworks (clusters, modules) so that the nodes belonging to a group are more densely connected within the group than to other groups. A modularity index Q measures the level of separation. Q is normalized so that Q = 0 means no separation (no modules found), and Q = 1 complete separation into well-defined modules.

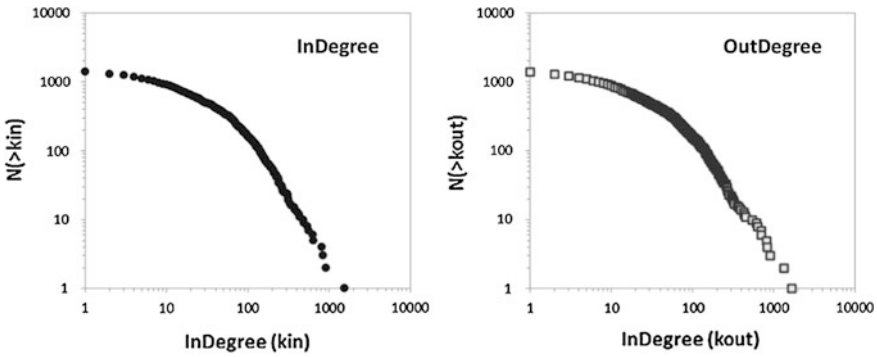

Fig. 1 Cumulative degree distributions (*in*-and *out-degree*)

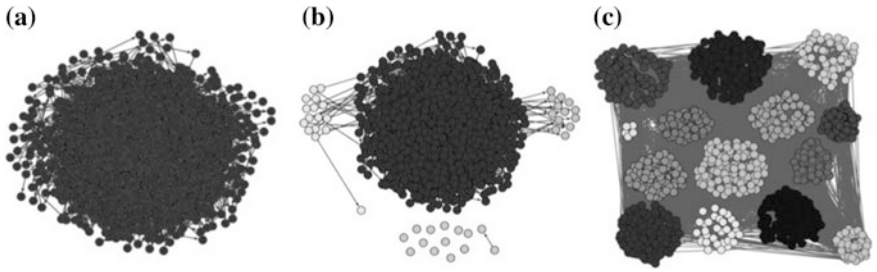

Fig. 2 The network (**a**), its bow-tie components (**b**), and the clusters from the modularity analysis (**c**)

Among the many possible algorithms proposed we used the *Louvain* method (Blondel, Guillaume, Lambiotte, & Lefebvre, 2008), which gives a good resolution power, while providing a small number of well-balanced clusters. The analysis found 14 communities (plus one with the disconnected nodes) and a modularity index Q = 0.665, showing thus a set of relatively well-defined groups. Figure 2 shows the network, its bow-tie components and the clusters uncovered.

Finally we identified the most *popular* tracks by selecting the links with a weight >25 and calculating the most beaten paths (all the paths with the highest total weight). The results are shown in Fig. 3 which shows the distribution of the number of different points visited (hops). There is a clear distinction between a large majority of short paths and those with a higher number of locations. The main peak is at 8 and a secondary peak at 25.

A geographic rendering of the modules uncovered shows well this fact highlighting the mostly *local* nature of the movements recorded (Fig. 4).

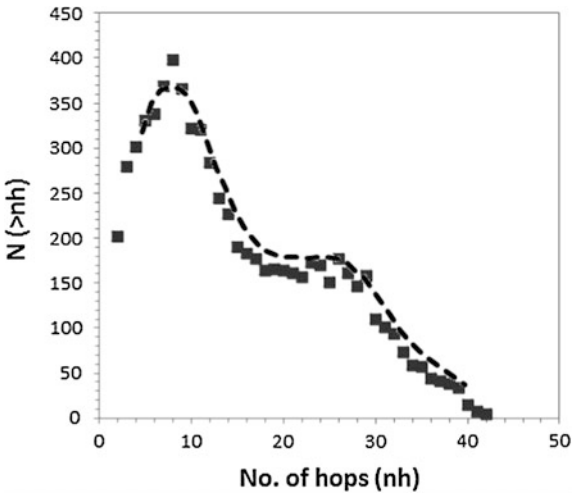

Fig. 3 The most popular paths in terms of number of visited locations (*dotted line* has the sole purpose of guiding the eye for a better visualization of the pattern)

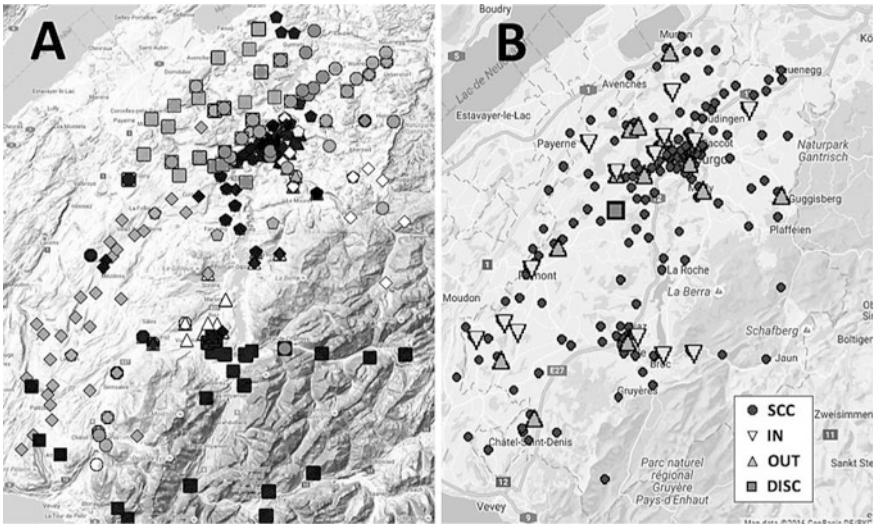

Fig. 4 The geographic rendering of the different modules found (panel A: different shapes represent the different modules) and of the bow-tie components (panel B: *SCC* = connected component, *IN*, *OUT* components and *DISC* = disconnected elements)

5 Conclusions

The results using network analysis techniques on passive mobile positioning data yield the following results. Firstly, the modularity clustering seems to be useful to identify Leiper nuclear-mix patterns. Secondly, the bow-tie structure obtained is in line with the node itinerary classification by Lew and McKercher (2002) allowing to identify getaway and egress ones. Thirdly, network analysis clusters VF in paths weighted by popularity. Last but not least, network analysis seems to be suitable for dealing with large amounts of data such as those on passive mobile positioning.

The analysis of guest–cards of Fribourg described in Sect. 2.2 yields similar results showing that the bow-tie structure is well present also in that network. An extended analysis of these data, using attractions as nodes, will shed some light on the following question: are gateway really entry nodes or are just an artefact of the method? This is part of the future research plan.

This research does not aim to fully explain every aspect of VF, but it shows how the application of network analysis can help in grasping an important aspect, the spatial one. Then, with a good knowledge of the destination and its peculiarities, the results can be interpreted in order to provide useful insights into the understanding of the real movements of people. This will enable improvement of marketing promotions and the design of new products or services that have a better connection with the travellers' preferences and needs.

Data used in this research belongs to one specific European country, replication of this methodology on other countries and cross comparisons will be useful in finer tuning the methods and gaining wider knowledge of the phenomenon. Finally, the results reported here will be compared with those obtained in expert workshops at destination in order to increase the level of collaboration between the different providers and stakeholders.

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Structural Implications of Destination Value System Networks

Jason L. Stienmetz and Daniel R. Fesenmaier

Abstract This study establishes the foundation for a system-level model for understanding destination value creation—the Destination Value System (DVS)—by empirically testing the relationships between destination network structures and total value created within a destination. Volunteered geographic information from 4.3 million geotagged Flickr photos and Florida tax records were used to describe the quarterly network structures and quarterly travel-related spending for 43 Florida destinations between 2007 and 2015. Econometric analysis of the panel data indicates that DVS network structures and seasonal effects have significant relationships with the total tourism-related sales of a destination. Density, out-degree centralization, and global clustering coefficient are found to have negative effects on destination value creation, while in-degree centralization, betweenness centralization, and subcommunity count are found to have positive effects. These results indicate strategic management of the destination network is an important activity of any destination management organization.

Keywords Destination value system · Volunteered geographic information · Destination networks Network analysis

1 Introduction

Inspired by changing traveller behaviour caused by information technology, the Destination Value System (DVS) model conceptualizes tourism destinations as collections of touchpoints—instances of interaction among distinct actors which are

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then connected through the sharing of resources (Stienmetz & Fesenmaier, 2013). The DVS model builds upon the classic destination value chain model (Poon, 1993) wherein the network of traveller' activities which connect destination touchpoints can be used to represent core value creation processes. Thus, the DVS model defines a destination as a set of touchpoints that are connected through value creation processes, with each core value creation process embodying a distinct network structure. Importantly, all DVS process networks coexist simultaneously within a destination and represent complex, multi-faceted, and inter-related sub-systems within a destination that are expected to be interrelated (Stienmetz & Fesenmaier, 2013; Tham, 2015).

The conceptualization of tourism destinations as networks is not new, and previous research supports the proposition that the network structures of travellers' activities affect the value created within a destination (e.g. Sfandla & Björk, 2013; Tax, McCutcheon, & Wilkinson, 2013; Tham, 2015; Zach & Gretzel, 2011). However, while these studies have described networks representing relationships between destination actors, few have examined the significance of destinations' network structures in terms of outcomes. In particular, studies by Stienmetz and Fesenmaier (2015a, b) found that the flows of visitors between touchpoints can be used to predict individual attractions' contribution to total visitor expenditures. Further, Baggio, Scott, and Cooper (2010) and Stienmetz and Fesenmaier (2015b) demonstrate that DVS networks are dynamic, rather than static, and the marginal impacts of network structures fluctuate based on the seasonal changes in visitor behaviours within a destination. So while development to date of the DVS model has focused on the value created from dyadic relationships between destination stakeholders, little work has been done to understand how destination-level network structures influence the value created within a destination (and ultimately its competiveness). This study, therefore, builds upon previous DVS research in order to determine the relationship between destination-level network structures and total value creation within a destination so as to determine the network structures at the destination which would maximize value creation.

2 Background

In the context of DVS networks, nodes represent distinct touchpoints (such as the activities, websites, and attractions experienced by the traveller) within a destination and the ties connecting these nodes represent the exchange of resources between touchpoints. For an experience co-creation network (which is just one subcomponent of the DVS model), nodes represent the physical places visited by travellers and ties represent the movement of travellers between destination places, such as when a traveller goes from one attraction to another. Therefore, travellers are considered a resource that is exchanged between touchpoints—an essential input required for value creation within the destination (Prebensen, Vittersø, & Dahl,

2013)—and DVS networks represent the interaction of supply-side and demand-side actors within the destination system.

The inter-connectedness of actors is one of the essential propositions of network theory where it posits that no independent actions are taken within a network—rather actions are interdependent and occur within the constraints and opportunities provided by the structure of the network (Wasserman & Faust, 1994). Traditionally, network theory has developed where characteristics of the network (i.e. the network structures) are used to explain some outcome such as individual or network success (Borgatti & Halgin, 2011). Following this logic, it is expected that the network structure of a destination influences how (e.g. the nature and extent to which) value is created within a destination. As such, several key network characteristics (density, in-degree centralization, out-degree centralization, betweenness centralization, global clustering coefficient, and subcommunity count) have been established in the network theory literature as important factors influencing network outcomes in general, and support the overall proposition that there is a relationship between network structures and destination value creation.

Network density is a measure of the overall connectedness of a network and is determined by dividing the total number of ties observed within the network by the total number of possible ties that could occur within the network (Aggarwal, 2011, p. 180). Related to density, embeddedness refers to "the stockpiling of reciprocal obligations through social relations that act as the glue that binds interests together in patterns and webs of integration" (Scott, Baggio, & Cooper, 2008, p 81). Embeddedness of tourism organizations has been found to foster inter-organizational trust and the promotion of knowledge transfer and learning (Bhat & Milne, 2008). Not only does embeddedness increase as the density of a network increases, but so too does the network's shared values and conformity. Therefore, within a tourism destination, greater density of the DVS network is likely to result in a more embedded destination system that is able to create more value, which leads to the first hypothesis:

H_1: DVS network density will have a significant positive effect on destination value creation.

Within networks where ties have a weight value, weighted node degree centrality is defined as the sum of the weight of all ties a focal node *i* shares with all other nodes *j* in the network. Weighted degree centrality reveals how connected a particular node is with the rest of the network and is also a measure of the importance of a node within the network; thus, the more connected and central the position of a node, the greater the node's power within a system (Borgatti & Halgin, 2011). A node with high centrality is usually considered more influential than other nodes because high centrality gives a node access to the exchanged resource (i.e. tourists) and results in the node performing coordination functions within the network (Bhat & Milne, 2008).

In directed networks in which the direction of relationships is recorded, two separate measures of in-degree centrality and out-degree centrality can be calculated for each node. Within tourism destinations, out-degree centrality can be used to describe coordination functions within the inter-organizational destination network

(Bhat & Milne, 2008). That is, out-degree represents the extent to which a touchpoint passes on tourists to other touchpoints, thereby allowing others to make use of its resources and also elevating its level of influence on the system. Therefore, as network out-degree centralization increases, it is expected that the capacity of destination to create value (i.e. generate tourism receipts) will increase. This leads to the second hypothesis:

H_2: The out-degree centralization of a DVS network will have a significant positive effect on destination value creation.

While diffusion and coordination of destination resources performed by central nodes are expected to benefit the performance and competitiveness of a destination, the number of "powerful" highly central nodes may also have negative implications. Network Power Theory suggests that competition within the destination increases and negotiating becomes more difficult as the number of powerful nodes within the network increases (Borgatti & Halgin, 2011). If there are too many nodes with positions of power within the network, there is an increased likelihood of stalemates when it comes to trying to influence the network as a whole. Based upon this literature it is hypothesized that:

H_3: The in-degree centralization of a DVS network will have a significant negative effect on destination value creation.

The unbalanced distribution of resources within the destination network also can be measured as a function of node (touchpoint) betweenness—the extent to which a particular node lies between various other nodes within the network. Actors with high betweenness may signify bridging ties or structural holes within a network where a large amount of information passes through before interacting with other clusters of network stakeholders (Borgatti & Halgin, 2011). Nodes with high betweenness centrality can, therefore, be considered boundary spanners—actors with the ability to more easily communicate with other clusters of actors within the network. The flow of resources (such as knowledge or travellers) within the network often depends on the ability of boundary spanners to create relationships between other nodes within the network (Easterby-Smith, Lyles, & Tsang, 2008). Furthermore, the more diverse touchpoints are within the tourism destination, the more critical the role of a boundary spanner is for the flow of resources between DVS stakeholders (Carlile, 2002). Bridging ties may also benefit the tourism destination and increase value creation as they promote imitation and innovation at the destination, as boundary spanners facilitate the spreading of best practices (Haugland, Ness, Grønseth, & Aarstad, 2011; Ness, Aarstad, Haugland, & Gronseth, 2013). Based on this literature, the following hypothesis is formed:

H_4: The betweenness centralization of a DVS network will have a significant positive effect on destination value creation.

Clustering refers to the degree to which a node and its immediate neighbours are all directly linked to each other (Freeman, 2011) and the global clustering coefficient of a network is the ratio of closed triplets to connected triplets within a

network (Jackson, 2010, p. 35). Importantly, clusters represent cohesive subcommunities within a network which benefit from high embeddedness (Jackson, 2010). The sharing of network connections, whether the result of stakeholder effort or common characteristics such as geographic location or shared clientele, can lead to homophily and a sharing of common values within a network cluster (McPherson, Smith-Lovin, & Cook, 2001), and suggests collaborations among stakeholders within the same DVS cluster are more likely to be successful compared to collaborations among stakeholders from different DVS clusters. With this literature as a foundation, the following hypothesis was constructed:

H_5: Global clustering coefficient of a DVS network will have a significant positive affect on destination value creation.

It is also important to understand how nodes cluster so as to form subcommunities that can be identified through modularity analysis of the network, which is a comparison of the density of links inside the cluster as compared to the density of links between clusters (Blondel, Guillaume, Lambiotte, & Lefebvre, 2008). Each cluster within a tourism destination may represent a broad boundary group, where practices, languages, systems, etc. are different from other clusters (Easterby-Smith et al., 2008; Star & Griesemer, 1989; Van Wijk, Jansen, & Lyles, 2008). Network diversity can be determined as the number of different clusters of nodes there are within the network. Network diversity has been found to increase innovation within organizational systems (Hargadon & Sutton, 1997). While challenges may be involved with spanning boundaries that exist between different subcommunities (Carlile, 2002), it is expected that the more diverse the destination network, the more overall advantage will be gained based upon the unique perspectives of each subcommunity. This leads to the following hypothesis:

H_6: The number of network clusters (i.e. subcommunities) in a DVS network will have a significant positive effect on destination value creation.

It is also expected that DVS networks are dynamic in that patterns of visitor behaviour fluctuate over time due to both external and internal factors (McGlohon, Akoglu, & Faloutsos, 2011; Pavlovich, 2003; Yabuta & Scott, 2011). Tourism research has clearly established that seasonal variability exists for many tourism destinations, in terms both arrivals (Hui & Yuen, 2002), length of stay (Uysal, Fesenmaier, & O'Leary, 1994), and visitor spending (Koc & Altinay, 2007). Stable patterns of seasonality can also be used to forecast tourism expenditures (Koc & Altinay, 2007; Li, Wong, Song, & Witt, 2006). A common property of dynamic social networks observed over time is the presence of a stable, main connected component that is also accompanied by the presence of secondary clusters that oscillate in size and may even gel with the main connected component (McGlohon, Akoglu, & Faloutsos, 2011). Therefore, the following hypothesis will be tested:

H_7: Seasonality, measured by quarterly time period, will have a significant and variable impact on total value creation within a DVS network.

3 Methods

Econometric analysis of panel of data comprised of quarterly travel-related spending and network structures of traveller activities for 43 Florida destinations between 2007 and 2015 was conducted to test the seven hypotheses. The spending data was obtained from Florida Department of Revenue tax records while the travel patterns were created using 4.3 million volunteered geographic information (VGI) geotagged Flickr photos. There are several advantageous characteristics of Flickr VGI which make it ideal for travel-related research. Up to 28.8% of Flickr users are estimated to geotag their photos, thereby voluntarily opting-into share the location of where their photos are taken (Purves & Hollenstein, 2010) and research has found that the main motivations for using the Flickr service are to create a personal archive of photos, and to share photos with friends (Angus & Thelwall, 2010). This archiving behaviour benefits tourism researchers because it suggests that users are less selective in what photos they upload to Flickr (Murray, 2008), thereby creating a more complete record of all places visited. Further, recent research indicates that there is a strong correlation between network structures based on VGI and network structures based on reliable visitor survey data (Stienmetz & Fesenmaier, 2016).

The mining of VGI data using the Flickr API began March 1, 2016, and was completed on April 15, 2016. The result of this effort was the creation of a PostgreSQL database containing a total of 4,256,236 unique photos and related metadata. The relevant metadata captured for each photo included the unique identifier of each photo, the username, the time and date the photo was taken, and the latitude and longitude where the photo was taken. In order to create traveller activities networks based on these VGI data, a number of operational definitions were required.

Tourism destinations were operationalized as the individual counties in the State of Florida. While the administrative boundaries of counties have little bearing on the flow of travellers since travellers are free to move unrestricted from county to county (Beritelli, Bieger, & Laesser, 2013), it is important to highlight that each Florida county has its own autonomous policies for regulating travel and tourism. For example, each county in Florida has the discretion to charge a “bed tax” that ranges from zero percent to six percent of transient room sales. Furthermore, while the state tourism office, visit Florida, is responsible for the overall promotion of tourism for the State of Florida, each county also has a Tourism Development Council which uses the bed tax revenue to promote and develop tourism within the county.

For the purposes of this study destination touchpoints were defined as the specific locations in physical space in which photos were taken. In order to maintain a manageable number of touchpoints for each DVS network and ensure adequate coverage of touchpoints (i.e. enough travellers to each touchpoint), the latitude and longitude coordinates of each photo were rounded from a precision of up to six decimal places down to a precision of three decimal places. In this way all photos

geotagged within an approximately 2.5-acre area were aggregated to a single touchpoint (Vrotsou, Andrienko, Andrienko, & Jankowski, 2011). This resulted in network nodes that represented areas approximately the size of one city block. The issue of irrelevant touchpoints within the data set was also addressed. Because the data set may have contained photos that were not travel related (e.g. photos of a new-born taken at home), this study followed the methodology of Vrotsou et al. (2011) and only included touchpoints where photos were taken by at least five unique Flickr users.

This study operationally defined the traveller as any unique Flickr user that photographed (i.e. visited) at least one touchpoint within the destination. Consequently, this analysis did not consider whether or not a traveller was a local inhabitant or whether or not they were staying overnight in the destination. Instead, this operational definition of traveller allows for all flows between touchpoints within a destination to contribute to the overall destination value creation system. Related to the traveller construct, a trip segment was defined as a traveller's movement from one touchpoint to another within a 7 day period beginning on a Wednesday and ending on a Tuesday. If visits between touchpoints occurred within different weeks, then they were treated as independent events and were not considered to be connected by a trip segment.

Based on the above operational definitions, traveller activity networks for each destination were created from the Flickr VGI data. The set of photos taken by each unique user was identified and sequenced according to time taken (as reflected in the metadata of the photo). This generated a list of times and places that a single Flickr user was in the destination and that list was segmented into week long blocks, which in turn, was used to create an adjacency matrix representing each traveller's activated path through the destination. Next, all user adjacency matrices for a specific destination and quarterly time period were summed, and resulted in a weighted adjacency matrix where each cell value represented the weight of the tie (i.e. how many travellers took the trip segment) connecting two touchpoints nodes. Last, each weighted adjacency matrix was used as the input to perform traditional network analysis resulting in quarterly destination metrics for each destination.

Destination value creation was operationally defined as the quarterly tourism and recreation related taxable sales as reported by the Florida Department of Revenue (2015). As classified by the Florida Department of Revenue, tourism and recreation sales come from the following 12 kind codes representing distinct sectors of the Florida economy: Hotels and Motels, Bars and Restaurants, Liquor Stores, Photo and Art Stores, Gift Shops, Admissions, Sporting Goods, Rentals, and Jewellery Stores. The quarterly network metrics data for each destination were then merged with the quarterly taxable tourism-related sales data for each destination in order to create the final data panel used in this study.

As described above, the creation of network metrics was dependent on a sufficiently large sample of VGI data for each destination for each quarter. Consequently, a number of panel observations were omitted and considered missing because the metrics could not be reliably calculated. Also, following Nunnally (1967) those Florida destinations with fewer than 10 quarterly

observations were excluded from the econometric analysis. As a result, the final panel used for econometric analysis consisted of 43 separate destinations spanning 36 quarterly time periods for a total of 1,364 observations.

4 Results

The model used for this study is specified as follows:

$$\begin{aligned} LTRS_{it} = &\alpha_i + \beta_1 D_{it} + \beta_2 IDC_{it} + \beta_3 ODC_{it} + \beta_4 BC_{it} + \beta_5 GCC_{it} \\ &+ \beta_6 CC_{it} + \beta_7 Q2_t + \beta_8 Q3_t + \beta_9 Q4_t + u_{it} \end{aligned} \quad (1)$$

where the sub index i is for one of the 43 Florida destinations included in the panel and t is for one of 36 quarterly time periods between the years 2007 and 2015. Variables in the proposed model are specified as below:

- $LTRS_{it}$ is the natural log of total taxable tourism-related sales for destination i during time period t
- α_i is the constant term for each destination which takes into account the individual specific characteristics of the destination
- D_{it} is the network density of destination i during time period t
- IDC_{it} is the network in-degree centralization of destination i during time period t
- ODC_{it} is the network out-degree centralization of destination i during time period t
- BC_{it} is the network betweenness centralization of destination i during time period t
- GCC_{it} is the network global clustering coefficient for destination i during time period t
- CC_{it} is the count of subcommunity clusters found in the network for destination i during time period t
- $Q2_t$ is the dummy variable for quarter two that takes the value 1 in the second quarter and 0 elsewhere
- $Q3_t$ is the dummy variable for quarter three that takes the value 1 in the third quarter and 0 elsewhere
- $Q4_t$ is the dummy variable for quarter four that takes the value 1 in the fourth quarter and 0 elsewhere
- u_{it} is the random error term.

Based on the requirements of both model consistency and efficiency, a number of econometric estimation techniques were rigorously evaluated including ordinary least squares, fixed-effects, random effects, first difference, two-way effects, and feasible generalized least squares (FGLS). Based on the Hausman test for model consistency and the Breuch-Godfrey test for serial correlation, the FGLS method was selected for final estimation of the proposed model. The advantage of this

Table 1 FGLS model estimation results

Variable	Coefficient	Variable	Coefficient
D	−0.27[a]	CC	0.0002[a]
	(−14.89)		(6.06)
IDC	0.12[a]	Q2	0.05[a]
	(14.44)		(7.35)
ODC	−0.07[a]	Q3	0.01
	(−9.32)		(0.56)
BC	0.24[a]	Q4	−0.08[a]
	(23.90)		(−13.07)
GCC	−0.02[a]	R-Squared	0.98
	(−17.57)		

Note Values in parentheses are t-statistics, [a] = significant at the 0.001 level

estimator is that it is robust to serial correlation in the idiosyncratic errors and also to heteroscedasticity (Wooldridge, 2002, pp. 276–278). The FGLS estimator also controls for individual heterogeneity of subjects (i.e. the unique constant term α_i for each destination) while increasing degrees of freedom, reducing collinearity, and improving efficiency (Baltagi, 2013). Results of the FGLS model are reported in Table 1. The total variance in tourism-related spending for each destination explained by the FGLS model was 98 percent, $R^2 = 0.98$, $p < 0.001$. With the exception of the Quarter 3 dummy variable, all regression coefficients were statistically significant. Network density was found to have the strongest negative effect on tourism and recreation sales, while network betweenness centralization was found to have the strongest positive effect.

5 Discussion

Based on these results, it is determined that DVS network structures have mixed effects on destination value creation. Three characteristics of network structure (density, out-degree centralization, and global clustering coefficient) were found to have negative effects, while three characteristics of network structure (in-degree centralization, betweenness centralization, and subcommunity count) were found to have positive effects on destination value creation. Likewise, there were mixed seasonal effects. While all network structure variables were found to have statistically significant relationships with destination value creation, the directions of the relationship for density, in-degree centralization, out-degree centralization, and global clustering coefficient were opposite from what was hypothesized. Table 2 summarizes the result of hypothesis testing based on the FGLS model coefficients.

Table 2 Results of Hypotheses Testing

H_1: DVS network density will have a significant positive effect on destination value creation.	Not supported
H_2: The out-degree centralization of a DVS network will have a significant positive effect on destination value creation.	Not supported
H_3: The in-degree centralization of a DVS network will have a significant negative effect on destination value creation.	Not supported
H_4: The betweenness centralization of a DVS network will have a significant positive effect on destination value creation.	Supported
H_5: Global clustering coefficient of a DVS network will have a significant positive affect on destination value creation.	Not supported
H_6: The number of network clusters (i.e. sub communities) in a DVS network will have a significant positive effect on destination value creation.	Supported
H_7: Seasonality, measured by quarterly time period, will have a significant and variable impact on total value creation within a destination.	Supported

Although not all hypotheses were supported, there is still strong empirical evidence of relationships between DVS network structures and destination value creation, which supports the overarching proposition that network structures and destination value creation are related. That statistically significant relationships between DVS structures and value creation exist (regardless of hypothesized direction of the relationships) confirms the basic tenet of network theory that outcomes within a network are constrained by the structure of the network. The results of this study are, therefore, consequential because they establish that network principles hold true for tourism destinations, and validate the assumptions on which the DVS model are based, namely that destination systems can be managed through an understanding of their network structures. In other words, this study has established a foundation on which to further develop destination value creation network theories.

Importantly, the network paradigm supported by the DVS model argued that we need to shift from a "value added" approach (i.e. the return on investment from marketing and sales activities) to a "value creation" approach to destination management which highlights relationships between stakeholders that can enhance differentiation or reduce costs (Porter, 1985). The proposed DVS model provides a framework upon which "smart" destination systems will enable destination managers to gain competitive advantage by recognizing the patterns of traveller activities within a destination and understand how those activity patterns create value. Furthermore, the network approach upon which the DVS model is based emphasizes that destinations are not static systems (i.e. structures fluctuate and evolve over time), which is consistent with the recent destination models put forth by Beritelli, Bieger, and Laesser (2013) and Sfandla and Björk (2013), and argues that management must realign so that it can better address the huge degree of variation in traveller markets. Thus, forecasting models which include simulation should be developed.

Tourism destinations are networks that effect value creation. From a theoretical perspective, these questions can be in part answered through continued development of the DVS model, and, in particular, the next step in the DVS model's development is to understand the antecedents of destination network structure formation and the ways in which these network structures can be encouraged and supported.

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An Integrative Model of the Pursuit of Happiness and the Role of Smart Tourism Technology: A Case of International Tourists in Seoul

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Abstract Tourists pursue life happiness through travel and feel happy when their destination's travel services are satisfying. This study may be the first to examine an integrated perceived experience of smart tourism technology (STT) and destination value. Using a sample of 191 international tourists in Seoul, the model assesses two distinct motivational routes (STT and perceived values) to a greater experience of satisfaction. The findings explain the positive effect of the STT experience and destination experience on tourist happiness. Importantly, tourists are likely to perceive destination value as a primary factor influencing overall happiness. This paper's theoretical and practical applications extend the literature on tourist happiness.

Keywords Tourist happiness · Smart tourism technology attributes · Perceived value · Tourism satisfaction · Seoul tourists

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1 Introduction

In recent research, academics and industry specialists have examined quality of life (QOL) as achieved through leisure or tourism activity (McCabe & Johnson, 2013; Neal, Uysal, & Sirgy, 2007). In tourism, QOL studies have addressed various dimensions of travel in relation to the idea that a higher level of tourist happiness increases overall life satisfaction (Neal et al., 2007; Sirgy et al., 1982, 2011). Subsequently, with the remarkable advent of Information Communication Technology (ICT), enhancing tourist satisfaction through ICT has become a primary goal in destination tourism and one that has a direct influence on tourist satisfaction (Buhalis & Amaranggana, 2015). Through smart tourism technology, tourists' interests have become oriented towards a destination's experience value. The smart tourism technology of a destination contributes to the tourist's service experience by connecting the tourist to information sources, increasing access to information, providing unlimited directional interaction, and enabling the tourist to personalize information.

Despite the numerous investigations of perceived value and travel and service satisfaction, studies on significant questions related to smart technologies are limited. Thus, this paper aims to fill the research gap by integrating the effect of smart technologies on the tourist's perceived value of a destination. In this respect, the paper identifies theoretical antecedents that enrich the smart technology experience and the perceived value of a destination. We empirically examined a research model to discover the level of significance of tourist happiness generated by service satisfaction and travel satisfaction.

2 Theoretical Background

2.1 Happiness and Tourism

Based on philosophical studies, happiness research has extensively adopted the following two types of psychological concepts: subjective well-being (SWB) and psychological well-being (PWB) (Ryff, 1989). For Diener, Suh, Lucas, and Smith (1999) SWB is associated with human emotional responses, life satisfaction, and a positive judgment of overall life satisfaction. In contrast, PWB is based on Aristotle's theory of happiness, which is oriented toward self-development and personal potential (Ryff, 1989). For Ryff (1989), this measure of happiness is closely related to multiple dimensions of life satisfaction, not only one's psychological functioning. In this study, the theoretical framework is based on the theory of life satisfaction, or subjective well-being (Neal et al., 1999; Su, Huang, & Chen, 2015). In recent research, increased interest in the overall quality of life (i.e., the well-being) of individuals has broadened our understanding of how individuals pursue happiness (McCabe & Johnson, 2013). As economic circumstances improve, individuals can

increasingly afford to travel and have more leisure time in which to pursue their view of happiness. That is, today, tourists seek unique travel experiences that are tailored to meet their needs with respect to increasing quality of life.

2.2 Perceived Value of a Destination

Woodruff (1997) simply stated that perceived value is the associated benefit one receives relative to price, psychological sacrifice, worth, and quality. Numerous studies that define the perceived experience value have examined tourism contexts (Prebensen, Woo, Chen, & Uysal, 2012). Based on Rintamäki, Kanto, Kuusela, and Spence (2006) perceived customer value can be evaluated in a three-value perspective: utilitarian, hedonic, and social. In the utilitarian value perspective, monetary benefits are a key factor. For instance, in destination tourism, the utilitarian value increases when a tourist assesses the overall evaluation of what is provided and what is received in terms of service and quality (Prebensen et al., 2012). Compared to utilitarian value, which is focused on cognitive assessment, hedonic value concerns affective matters. In the context of tourism services, Lee, Yoon, and Lee (2007) emphasized the emotional response of the tourist to how pleasant a travel experience is. In addition, a customer typically desires to express his or her personal beliefs or values in a manner that enhance his or her social status and/or self-esteem and that contributes to increasing social value (Rintamäki et al., 2006). Finally, many studies have shown that these three attributes are foremost effective predictors of the perceived value of a destination (Prebensen et al., 2012). Bardley and Sparks (2012) suggest that the antecedents of the perceived value can change according to the tourist's perceived value, destination experience, and travel services experience.

2.3 Travel Service and Experiences

Neal et al. (2007) demonstrated that the tourist's activities at the destination are strongly associated with overall travel/tourism satisfaction. Specifically, tourism services that include pre-trip services (e.g., reserving a hotel or a restaurant, a ticket reservation), on-the-way services (e.g., the use of airlines or public transportation), destination services (e.g., the use of destination resources), and after-trip services (e.g., return-flight services) critically influence a tourist's evaluation (Neal et al., 2007). In addition, a positive relationship between tourism satisfaction and tourist life satisfaction was confirmed (Neal et al., 2007).

In the evaluation of perceived service quality, Parasuraman, Zeithaml, and Berry (1985) declared that service quality is an intricate measure because it involves not only tangible judgment but also service intangibility. Service intangibility is required to understand service quality perceptions of customers on how well customers' expectations are met with service performance. Zeithmal et al. (1993)

explained the disconfirmation of service quality is resulted when the discrepancy between predicted expectations and perceived service performance is realized. Based on the service quality literature, the development of information technology may assist in providing the actual tangible and intangible services to the customers who are able to control information and adjust as desired (Buhalis & Amaranggana, 2015). Recent research has examined which factors increase tourist satisfaction when experiencing destination services (Buhalis & Amaranggana, 2015; Vicini, Bellini, & Sanna, 2012) and concluded that information technology at the destination has a significant impact that enables a consistent communication.

2.4 Smart Tourism Technologies

Although the effects of various practices in fostering destination competitiveness to facilitate tourist demands have been demonstrated, implementing smart technology at a tourism destination has been intensively discussed (Buhalis & Amaranggana, 2015). Gretzel, Werthner, Koo, and Lamsfus (2015) used the term "smart" in connection with city tourism to describe the trend of creatively using technology for various benefits: resource maximization, effective management, destination sustainability, and quality of life. Vicini et al. (2012) argued that sowing smartness in the destination city benefits residents and visitors by coordinating information and communication technology (ICT). Smart technology creates an opportunity to better communicate and engage with citizens that subsequently results in improved quality of life in general (Buhalis & Amaranggana, 2015). The cooperation of social systems and travel service for city residents and travelers helps expand the efficiency of city activities and services and eventually improves quality of life for all city users. Buhalis and Amaranggana (2015) note several dimensions of smart technology that could be usefully applied at a tourism destination: (1) technology-implemented environments for information sharing, (2) interactive communication systems; (3) end-user-friendly devices (i.e., smartphone) stations to encourage extended accessibility; (4) engaged stakeholders to provide tailored information and services. Based on the degree to which these four dimensions of smartness are implemented at a destination, the tourist experience can be perceived as satisfactory or happy (Vicini et al., 2012).

3 Research Model and Hypotheses

3.1 Attributes and Satisfaction of Smart Tourism Technologies

According to No and Kim (2015) Smart Tourism Technology (STT) consists of informativeness, accessibility, interactivity, and personalization. Informativeness refers to the usefulness and trustworthiness of travel information. Jeong and

Lambert (2001) argue that information is one of the factors that affect customer intention to use. According to Kim and Garrison (2009) accessibility plays a crucial role in mobile Internet service and affects the tourist's perception of usefulness (Muhtaseb et al., 2012). STT interactivity facilitates directional communication with other users and access to real-time information sharing or communication. It enhances their tourism or service experience through immediate feedback. In addition, STT personalization makes tourist decision making more efficient (Buhalis & Amaranggana, 2014) and provides tailored information that accommodates tourist needs. Mills and Morrison (2004) found that the perceived service quality of travel websites that were multi-dimensional (e.g., accessibility, interactivity, search, navigation, and security) influenced customer satisfaction. The STT experience enables tourists to receive distinctive service and enriches their travel experience (Tussyadiah & Fesenmaier 2007). Therefore, the increased use of STT attributes is expected to improve the tourist service experience in a manner that strongly guides the tourist's trip evaluation toward positive feelings or satisfaction (Park & Gretzel, 2007). Hence, the following two hypotheses are proposed.

H1a The attributes of smart tourism technologies have a positive impact on travel service satisfaction.

H1b The attributes of smart tourism technologies have a positive impact on travel experience satisfaction.

3.2 Perceived Value of Destination and Satisfaction

Perceived value is understood as the comparison, or trade-off, between "getting" or "giving" (Bradley & Sparks 2012; Gallarza & Saura, 2006), while satisfaction is the difference between expectation and results. Thus, prior studies have examined that perceived value is an important predictor of satisfaction, loyalty, and behavioural intention (Parasuraman & Grewal, 2000; Petrick & Backman, 2002). The previous studies demonstrated a strong association between the customers' perceived value and satisfaction (Murphy et al., 2000; Petrick, 2002; Gallarza & Saura, 2006). Lee et al. (2007) proposed a theoretical model that shows the effect of tourist perceptions regarding the demilitarized zone (DMZ) on satisfaction. The results revealed that tourists who perceive visiting DMZ as valuable are likely to have high level of DMZ experience satisfaction. In particular, because a tourist perceives products, services, and experience simultaneously at a destination (Prebensen et al., 2012), the tourist's perception is likely to affect the service experience at a destination. Therefore, in this study, the following two hypotheses are proposed.

H2a The perceived value of a destination has a positive impact on travel service satisfaction.

H2b The perceived value of a destination has a positive impact on travel experience satisfaction.

3.3 Tourist Satisfaction and Happiness

The research on the relationships between happiness and tourism, the idea of subjective well-being (SWB) has been proposed as a means to measure happiness. Dagger & Sweeny (2006) indicated that SWB is defined according to a particular experience or an environment, such as one's job, tourism, health, or family. Based on the SWB concept, Andereck & Nyaupane (2011), Filep (2014), and Neal et al. (2007) demonstrated relationships between the travel experience and SWB. In addition, Neal et al. (1999) and Sirgy et al. (2011) indicated that travel satisfaction can be attained through travel experience and that travel satisfaction affects quality of life, tourist SWB, and happiness. However, the effect of service experience on satisfaction and happiness has been less examined than that of the travel experience (Su et al., 2015, Su et al. 2016). Because tourism service is an interactive factor during travel and tourists are affected by travel services at a destination, tourism service could create tourist happiness (Filep, 2014). If tourists receive high-quality services, they are likely to have positive feelings. Dagger and Sweeny (2006) found that service-experience satisfaction in the health industry affects quality of life, well-being and happiness. Based on previous studies, following two hypotheses are proposed.

H3 Travel service satisfaction has a positive impact on tourist happiness.

H4 Travel experience satisfaction has a positive impact on tourist happiness.

4 Research Method

4.1 Instrument Development

All of ten constructs (Fig. 1) were operationally defined in previous studies (Table 1). The constructs were measured using multi-measurement items adapted from prior studies. All forty items used a seven-point Likert scale.

4.2 Data Collection

The data for this study were collected at or near famous tourist attractions in Seoul, South Korea. A total of 210 responses were collected using random sampling over a 3 week period (27 June to 15 July 2016). After excluding partial or incomplete questionnaires, 191 responses were used for analysis. The survey was similarly distributed to men (50.3%) and women (49.7%). Most respondents were aged 20–29 years (63.9%) and came from Asian countries (38.7%), followed by North Americans (24.6%) and Europeans (20.4%).

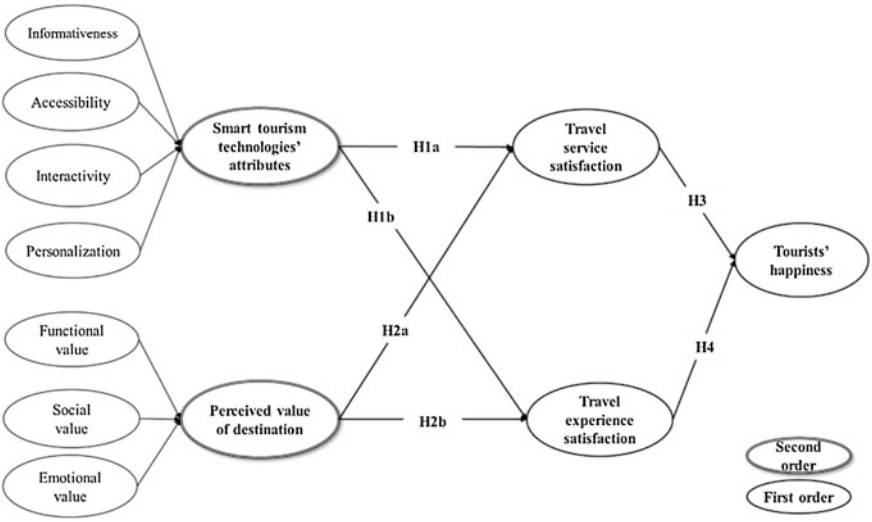

Fig. 1 Research model

Table 1 Operational definitions of constructs

Variable	Operational definition	Reference
Informativeness	The degree to which tourists perceive STT attributes as useful, trustworthy or valuable during travel	Pavlou, Liang, and Xue (2006)
Accessibility	The degree to which tourists perceive STT attributes as easy or uncomplicated during travel	No and Kim (2015)
Interactivity	The degree to which tourists perceive that STT attributes made interaction between users immediate or active during travel	No and Kim (2015)
Personalization	The degree to which tourists perceive that STT attributes provided specific tourism information that meets their needs during travel	No and Kim (2015)
Functional value	The tourist's perceived rational and economic valuations based on experiences at the destination	Lee et al. (2007)
Social value	The tourist's perceived value regarding the social impact of the experiences at the destination	Sanchez, Callarisa, Rodriguez, and Moliner (2006)
Emotional value	The tourist's perceived feelings or emotions based on experiences at the destination	Sanchez et al. (2006)
Travel service satisfaction	Tourist satisfaction with the quality of travel professionals, efficiency, and the cost of services during travel	Neal et al. (1999)
Travel experience satisfaction	The tourist's general satisfactory feelings regarding the travel experience	Neal et al. (1999)
Tourist happiness	The tourist's overall judgment of the extent to which they are happy or unhappy during travel	Lyubomirsky and Lepper (1999)

5 Analysis and Results

5.1 Measurement Model

The convergent validity was assessed using factor loadings, composite reliability, and average variance extracted (AVE). As shown in Table 2, all factor loadings were higher than the recommended value of 0.7 (Chin, 1998). In addition, the composite reliability values for each construct satisfied the requirements and ranged from 0.834 to 0.893 (Bagozzi, Yi, & Phillips, 1991). The AVE value was greater than the recommended value of 0.5 (Hair, Ringle, & Sarstedt, 2011).

Next, the discriminant validity was examined (Table 3). The square root of the AVE is higher than the correlations between each construct, and these results demonstrate adequate discriminant validity (Fornell & Larker, 1981).

5.2 Structural Model and Hypotheses Testing

The structural model was examined using the bootstrapping technique with a sample size of 500 through SmartPLS 3.0. The attributes of smart tourism technologies were significantly related to travel service satisfaction (H1a; $\beta = 0.175$, $t = 3.714$) but had no significant effect on travel experience satisfaction (H1b; $\beta = 0.049$, $t = 0.970$). The tourist's perceived value of the destination had a significantly positive impact on service experience satisfaction (H2a: $\beta = 0.487$, $t = 7.490$) and travel experience satisfaction (H2b: $\beta = 0.759$, $t = 15.970$). Finally, the travel service experience satisfaction (H3: $\beta = 0.202$, $t = 2.926$) and travel experience satisfaction (H4: $\beta = 0.596$, $t = 10.013$) were significantly and positively associated with tourist happiness (See Fig. 2).

6 Discussions

The primary purpose of this study was to develop a research model that explains the effect of smart tourism technology attributes and the destination experience on tourist happiness. The study found that traveller service satisfaction and travel experience satisfaction has a significant effect on tourist happiness. The results provided supporting evidence that the four dimensions of smart tourism technology attributes are equally promising predictors that enhance travellers service satisfaction in an overall sense. Interestingly, the attributes of smart tourism technologies significantly influence travel service satisfaction but in contrast were not meaningful with respect to travel experience satisfaction. Consequently, we believe that the user's perception of travel service is satisfying according to the level of tech-synchronized environment.

Table 2 Analysis of reliability and convergent validity

Variables		Items	Factor loading	Cronbach's alpha	Composite reliability	AVE
Attributes of smart tourism technologies	Informativeness	Infor 1	0.794	0.842	0.894	0.678
		Infor 2	0.836			
		Infor 3	0.842			
		Infor 4	0.821			
	Accessibility	Access 1	0.865	0.846	0.897	0.687
		Access 2	0.866			
		Access 3	0.847			
		Access 4	0.731			
	Interactivity	Inter 1	0.800	0.834	0.889	0.668
		Inter 2	0.854			
		Inter 3	0.792			
		Inter 4	0.821			
	Personalization	Personal 1	0.846	0.874	0.914	0.726
		Personal 2	0.865			
		Personal 3	0.849			
		Personal 4	0.848			
Perceived value of destination	Functional value	FV 1	0.781	0.854	0.902	0.696
		FV 2	0.837			
		FV 3	0.881			
		FV 4	0.836			
	Social value	SV 1	0.790	0.862	0.906	0.708
		SV 2	0.883			
		SV 3	0.852			
		SV 4	0.839			
	Emotional value	EV 1	0.887	0.893	0.926	0.757
		EV 2	0.877			
		EV 3	0.890			
		EV 4	0.825			
Travel service satisfaction		SS 1	0.835	0.846	0.897	0.684
		SS 2	0.837			
		SS 3	0.819			
		SS 4	0.817			

(continued)

Table 2 (continued)

Variables	Items	Factor loading	Cronbach's alpha	Composite reliability	AVE
Travel experience satisfaction	TS 1	0.840	0.868	0.910	0.717
	TS 2	0.813			
	TS 3	0.855			
	TS 4	0.878			
Tourist happiness	TH 1	0.825	0.859	0.904	0.703
	TH 2	0.848			
	TH 3	0.845			
	TH 4	0.834			

Table 3 Analysis of discriminant validity

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Infor	**0.823**									
(2) Access	0.709	**0.829**								
(3) Inter	0.810	0.814	**0.817**							
(4) Personal	0.629	0.819	0.756	**0.852**						
(5) FV	0.636	0.528	0.627	0.565	**0.834**					
(6) SV	0.539	0.505	0.550	0.545	0.816	**0.841**				
(7) EV	0.595	0.425	0.536	0.429	0.824	0.800	**0.870**			
(8) TSS	0.687	0.558	0.695	0.665	0.722	0.763	0.736	**0.827**		
(9) TES	0.627	0.427	0.509	0.419	0.810	0.789	0.866	0.743	**0.847**	
(10) TH	0.609	0.512	0.575	0.495	0.815	0.745	0.806	0.682	0.836	**0.838**

Note The diagonal values in bold are square roots of the average variance extracted (AVE)

This study found that emotion is the most powerful value that tourists perceive. Hoarau and Kline (2014) indicated that the evaluation of destination values starts from a cognitive judgment that is a relatively simple comparison of what is paid and what is received (Bradley & Sparks, 2012; Gallarza & Saura, 2006). Enhancing a positive destination experience thereby relies on multiple layers of personal involvement (i.e., physical, emotional, intellectual) with destination activities and services (Jennings et al., 2009). A series of findings indicate that travel service satisfaction is influenced by tourist perceptions of smart tourism technology (STT) attributes and the destination experience. The perceived value of a destination has slightly more impact on travel service satisfaction than STT attributes. In a sense similar to the previously elaborated manner in which tourists process and evaluate their experience, Prebensen et al. (2012) also state that evaluating the tourism experience captures product, process, quality, and emotional preferences as a whole and at one point. According to this logic, tourists are likely to recognize smart tourism technology attributes as part of the processing mechanism (i.e., a

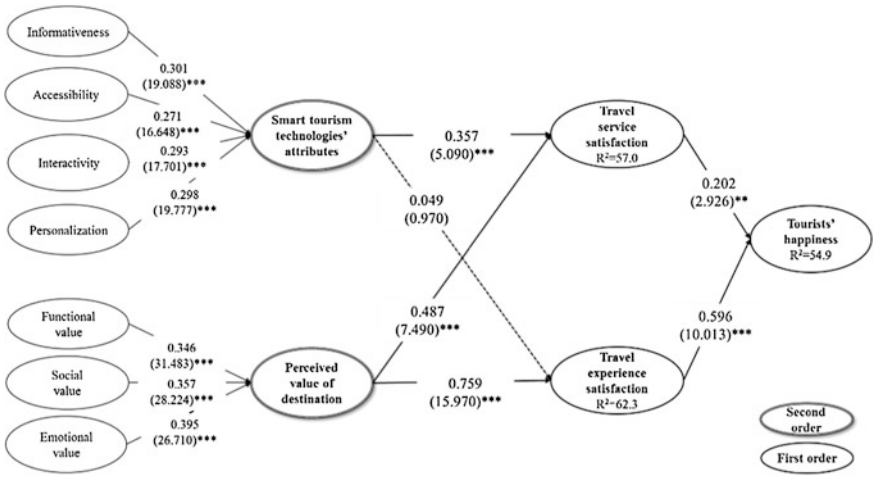

Fig. 2 Structural model results

tool) and to promote destination information as a general perception of tourism experience.

This study contributes a valuable insight regarding travel experience satisfaction that it has no association with STT attributes but a strong correlation with the perceived value of a destination. This insight supports prior studies that emphasize the emotional or personal factor in the tourism experience (Jennings et al., 2009; Pine & Gilmore, 1999; Prebensen et al., 2012) and according to which tourists are likely to encounter STT features as cognitive sources that increase the level of satisfaction with respect to the travel service experience. It is clear that the decision whether travel was satisfactory requires a multidimensional process that involves cognitive and emotional assessments. As expected, the result showed that tourist happiness could subjectively be the result of travel or leisure activities during which satisfying travel services are perceived. For two tourist motivational routes, the research found travel experience satisfaction to influence tourist happiness more than tourist service satisfaction.

This study also contributes to the theoretical and practical tourism literature in several ways. Regarding the theoretical implications, we extend the understanding of perceived happiness by establishing two distinct means in the research model to determine tourist happiness: travel service acquired using the attributes of smart tourism technologies and travel experience gained by evaluating destination values. In addition, the integration of the IT-based experience and the destination value experience is a valuable contribution to the tourism literature. Regarding practical implications, our results should assist all relevant stakeholders with useful insights. According to these findings, we conclude that destination cities should design a dynamic platform that mediates STT to promptly respond to tourist demands. If the travel service experience is enhanced, tourists will positively value their travel

experience (Bahalis & Amaranggana, 2014). Thus, providing easy access to information, establishing integrated information systems, and creating a technology-friendly environment would increase tourist engagement and contribute importantly to the overall travel experience. However, this study has several limitations. First, because the analysed data were for a single destination in Seoul, the results may not be easily generalized to all tourists who experience smart tourism technologies and destination values in other parts of the world. Second, even if the attributes of smart tourism technologies depend on an individual's ability (e.g., self-efficacy) to use technology, this study may not treat technology-related variables with due consideration. Last, future research could investigate additional relevant variables to determine factors that influence tourism happiness in general.

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Big Data as Input for Predicting Tourist Arrivals

Wolfram Höpken, Dominic Ernesti, Matthias Fuchs, Kai Kronenberg and Maria Lexhagen

Abstract International tourist arrivals increased by over 4,000% during the last 60 years, and as a labour-intensive business, tourism destinations and suppliers strongly depend on precise predictions of tourism demand. This study compares an autoregressive approach to predict tourism demand which is using past arrivals as input with an approach which predicts arrivals based on big data information as additional input, like the destination price level or the web search traffic per sending country, respectively. As prediction methods, the study uses the statistical approach of the linear regression and the data mining technique k-nearest neighbour (k-NN). Both approaches are executed and evaluated for the leading Swedish mountain destination Åre on the base of arrival data and big data sources for the time period 2005–2012. Study results show that (1) big data information sources can significantly increase the prediction performance of tourist arrivals compared to using past arrivals alone (i.e. autoregressive approach) and (2) data mining techniques (i.e. k-NN) can outperform statistical approaches, like linear regression.

Keywords Tourist arrival prediction · Big data · Data mining · K-nearest-neighbour

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1 Introduction

Tourism is one of the most important business sectors, representing 7% of total world exports, and, still, tourism is a growing market. Tourist arrivals increased by over 4,000% during the last 60 years and reached 1.2 billion arrivals in 2015 (UNWTO, 2015). Being a labour-intensive branch of economic activity, tourism destinations and suppliers strongly depend on precise predictions of the future demand in order to cope with long-term demand trends. However, besides such long-term trends, tourist arrivals typically follow strong seasonal trends. Therefore, autoregressive approaches, predicting future tourism demand simply on the base of past arrivals, typically lead to quite satisfactory results and have, thus, been used quite widely in tourism in the past (Song & Li, 2008, p. 210). However, tourism demand, especially international arrivals, are heavily influenced by external factors as well, like economic factors, such as exchange rates and consumers' available income (Frechtling, 2002; Song & Witt, 2000) or destination-specific factors, like destination marketing efforts (Brida & Schubert, 2008; Divisekera & Kulendran, 2006). Additionally, the increasing usage of Internet platforms by tourists for information gathering and corresponding electronic footprints of the customers regarding specific needs constitute promising new information sources as potential input to improve the accuracy of demand prediction, especially enabling to encounter singular or unexpected demand fluctuations induced by, e.g. natural disasters or mega events. Thus, besides tourist arrivals used by autoregressive prediction approaches, such external and internet-based information sources, often referred to as big data sources (Larose, 2005), can be used as additional input to improve tourism demand prediction models.

The objective of this study is to extend autoregressive demand prediction approaches by making use of big data information sources, like economic factors or data on the web search behaviour of potential customers per sending country, as additional input for predicting tourist arrivals. Particularly, the study evaluates whether including big data information sources can increase the performance of predicting tourist arrivals compared to autoregressive approaches (i.e. research proposition 1). As a second objective, the study will make use of data mining techniques for predicting tourist arrivals (e.g. k-nearest neighbour) additionally to statistical approaches, like linear regression, offering the advantage of not being restricted to a linear model and being more robust against biased and statistically inconvenient data (e.g. collinearity of input attributes). More concretely, the study will evaluate whether the data mining technique k-nearest neighbour (k-NN) achieves a better prediction performance than the statistical approach of linear regression (i.e. research proposition 2). The study will be executed for the leading Swedish mountain destination Åre on the base of arrival data for the period of 2005–2012 and additional big data information sources, like web search behaviour, exchange rates, consumers' available income and advertising expenditures for the most important sending countries, such as the United Kingdom and Denmark.

The chapter is structured as follows. Section 2 describes related work as well as past and current approaches tackling the problem of tourism demand prediction. Sections 3 and 4 discuss the methods for data collection and preparation as well as model building and evaluation employed in this paper. Section 4 discusses the study results and major findings while Sect. 5, finally, summarizes the results and provides an outlook on future research activities.

2 Related Work

Being one of the important areas in tourism research, demand modelling and prediction has attracted much attention of both academics and practitioners. These studies focus on the application of different techniques, both qualitative and quantitative, to model and predict the demand for tourism in various destinations (Song & Li, 2008, p. 203). Typically, the performance of demand models varies according to data frequencies used in the model, the destination-origin country/region data pairs under consideration, and the length of the prediction horizons considered. The tourist arrival variable is still among the most popular measures of tourism demand, although it is often decomposed into holiday tourist arrivals and business tourist arrivals (Song, Li, Witt, & Fei, 2010). Some studies used tourist expenditure in the destination as the demand variable (e.g. Kulendran & Wong, 2005).

Literature on quantitative demand modelling and prediction is dominated by two sub-categories: non-causal time series models and causal econometric approaches. A time-series model explains a variable with regard to its own past and a random disturbance term. In the past four decades integrated autoregressive moving average (ARIMA) models proposed by Box and Jenkins (1970) dominated the tourism literature (Song & Li, 2008, p. 210). Similarly, exponential smoothing models have appeared in the literature. By contrast, one of the major advantages of econometric approaches over time-series models lies in their ability to analyse causal relationships between the tourism demand (dependent) variable and its influencing factors (explanatory variables). Recent econometric studies of tourism demand have shown that consumer price index (i.e. tourism prices in a destination relative to those in the origin country, tourism prices in competing destinations [substitute prices]), gross domestic product (as proxy for tourists' income), exchange rates, but also interest and unemployment rate, money supply (M3), and export/import rates are among the most important (economic) determinants of tourism demand (Cho 2001; Song & Li 2008, p. 211). In addition, man-made events (i.e. especially mega-events), advertising investments (Divisekera & Kulendran, 2006; Kronenberg, Fuchs, Salman, Lexhagen, & Höpken, 2016), but also crises (e.g. financial crisis, terrorist attacks) and natural disasters (SARS, foot and mouth disease, etc.) significantly determine tourism demand (i.e. external shocks). In order to avoid spurious regression results, typically accruing with ordinary least square (OLS) techniques if applied to time series data, autoregressive distributed lag models (ADLM), the error correction model (EDM), the vector autoregressive (VAR) model and the time varying

parameter (TVP) model emerged as the main econometric models (Peng et al.2014). In addition, also the linear structural equation model (SEM) has been used for tourism demand modelling (Turner & Witt, 2001).

Since the availability of new, web-based data sources, like search engine traffic, web traffic, or customer feedback on online review platforms, having a natural relationship with tourism demand, such "big data" sources have been used for tourism demand prediction, as well. Bangwayo-Skeete & Skeete (2015) show that Google search engine traffic significantly increases forecasting performance, when using autoregressive mixed-data sampling (AR-MIDAS) models. Similarly, önder & Gunter (2016) proof that Google search engine traffic for web and image search improves tourism demand prediction accuracy, compared to a purely autoregressive model or an exponential smoothing time-series model, such as Holt–Winters. A recent study by Yang et al. (2015) uses web search volume to predict tourist arrivals for a popular tourist destination in China and demonstrates that search engine data help to significantly increase forecasting accuracy, compared to auto-regressive moving average (ARMA) models. Finally, a study by Yang et al. (2014) confirms the value of web traffic data from local Destination Marketing Organizations (DMOs) in predicting the demand for hotel rooms in a tourist destination.

Rather recently, non-statistical, i.e. artificial intelligence (AI) methods have been applied to modelling and predicting tourism demand. The main advantage of AI techniques is that they don't require any preliminary information about data, such as distribution, linearity, and probability (Song & Li 2008, p. 212). Typically, the following techniques have been applied: While trying to imitate the human brain, the Artificial Neural Network (ANN) emerged as the best performing model to predict tourism demand over decomposition, exponential smoothing, ARIMA and multiple regression (Kon & Turner 2005; Song & Li 2008, p. 212). Other ANN applications for tourism demand modelling and prediction are found in Law and Au (1999), Palmer, Jose Montano, and Sese (2006) and Lin, Chen, and Lee (2011). Rough Set Theory deals with the classificatory analysis of imprecise, uncertain or incomplete data (Song & Li 2008, p, 213). The rough set approach is a decision rule induction method to model relations that exist amongst a set of numeric and non-numeric variables. Its application to tourism demand modelling can be seen, for instance, in Law and Au (1988) and Goh, Law, and Mok (2008). The Fuzzy Time-Series method proved to be most suitable to analyse short time series with limited past observations (Hadavandi, Ghanbari, Shahanaghi, & Abbasian-Naghneh, 2011). Genetic Algorithms (GAs) are adaptive heuristic search algorithms premised on the evolutionary idea of natural selection and genetics (Song & Li 2008, p. 213) and are, thus, ideal in recognizing changes in the composition of tourism demand (Hernandez-López, 2004; Hong et al., 2011). Finally, Support Vector Machines (SVM) are used in solving the classification, non-linear regression estimation and prediction problem and were applied for tourism demand analysis by Pai, Hong, Chang, and Chen (2006) and Chen & Wang (2007). Empirical evidence shows that SVM was superior to ARIMA models in predicting tourism demand (Song & Li, 2008).

3 Data Collection and Preparation

3.1 Specification of Data Set

The data set contains tourist arrival data for the Swedish mountain destination Åre on a monthly level for a total period of 77 months (i.e. from December 2005 to April 2012), specified separately for the five most important sending countries Denmark, Finland, Norway, Russia and the United Kingdom. Overall, the data set contains 385 data entries.

Besides the tourist arrivals itself, the data set contains eight additional attributes, most of them belonging to the area of big data sources, described in more detail below. As most of these attributes are sending country specific, the prediction task is executed for each sending country separately.

- *Tourist arrivals*: The number of international tourist arrivals at the leading Swedish mountain destination Åre is specified for each month and sending country (i.e. Denmark, Finland, Norway, Russia and United Kingdom), ranging from 0 to 17,112 arrivals, provided by Åre's destination management organisation (Åre Destination AB).
- *Income*: The gross domestic product (GDP) of each sending country (i.e. in US dollar per inhabitant), available for this study on a quarterly basis, is used as substitute for consumers' disposable income. Previous research found a significant empirical influence of this variable on consumer demand in tourism (see: Song & Witt, 2000; Song et al., 2010).
- *Destination price level*: As tourists typically base their travel decision on expected costs arising in the destination (i.e. measured in terms of their local currency), the price level for international tourists in Sweden is calculated as the ratio of the consumer price index (CPI) for Sweden and the CPI of the sending country adjusted by the corresponding exchange rate (Song & Witt, 2000).
- *Price level of alternative destinations*: The price level of competing destinations affects the price elasticity of tourism demand (Divisekera & Kulendran, 2006). The price level of alternative destinations is calculated in an analogous way to the above destination price level. The choice of competitor destinations for each sending country is based on a qualitative interview with the marketing manager of SkiStar Åre (as the biggest tourism supplier of the destination).
- *Transportation costs*: Transportation costs, a significant share of the overall travel budget, affect travel decision behaviour (Frechtling, 2002; Song et al., 2010). As this study focusses on international tourism, only air transportation costs are considered and, due to the unavailability of past ticket fares, these cost data are substituted by global jet fuel prices, i.e. crude-oil prices traded at the Amsterdam-Rotterdam stock exchange market (European Commission, 2008).
- *Advertising expenditures*: Previous research has shown that advertising expenditures affect tourism demand (Divisekera & Kulendran, 2006; Kronenberg et al., 2016). In this study, the advertising expenditures attribute captures investments by SkiStar Åre in various advertising channels for the five

international sending countries listed above. Data on advertising investments are available on a yearly base, thus, equally distributed to a corresponding 12-month period.

- *Web search traffic*: Data for web search traffic for the destination Åre stems from the publicly available *Google Trends* data base. More precisely, *Google Trends* provides the percentage share per month in relation to the peak month of search requests for specific search terms. As search terms an appropriate combination of words using each country's alphabet (e.g. [Å,A]re, [Å,A]re winter, [Å,A]re ski) has been used.
- *Mega event and winter season effect*: In order to reflect the influence of mega events on tourist arrivals, a dummy attribute is employed to consider the effect of the FIS Alpine Ski World Championship held in the destination Åre in February 2007. Similarly, a dummy attribute *winter* is included and set at one for the 5 winter months (i.e. December to April) in order to highlight the significance of winter tourism for the Swedish mountain destination Åre.

Figure 1 shows tourist arrivals and web search traffic, exemplarily for the sending country Denmark, clearly demonstrating a strong correlation between the number of Google search requests for Åre-related search terms and the number of tourist arrivals in Åre over time. The strong correlation and clearly visible time-lag between Google search requests and tourist arrivals makes Google search requests a promising big data-based input to improve tourism demand prediction.

Figure 2 shows tourist arrivals and jet fuel price as substitute for transportation costs, exemplarily for the sending country Denmark. As to be expected, an increase of jet fuel price in the time period 2007–2008 comes along with a decrease of tourist arrivals from 2008 to 2009, while a strong decrease of jet fuel price in 2009

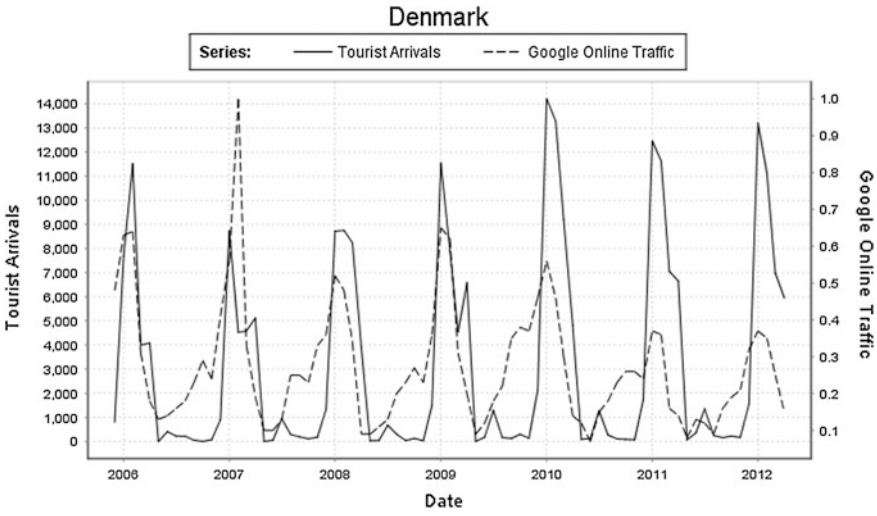

Fig. 1 Tourist arrivals and Google search requests for sending country Denmark

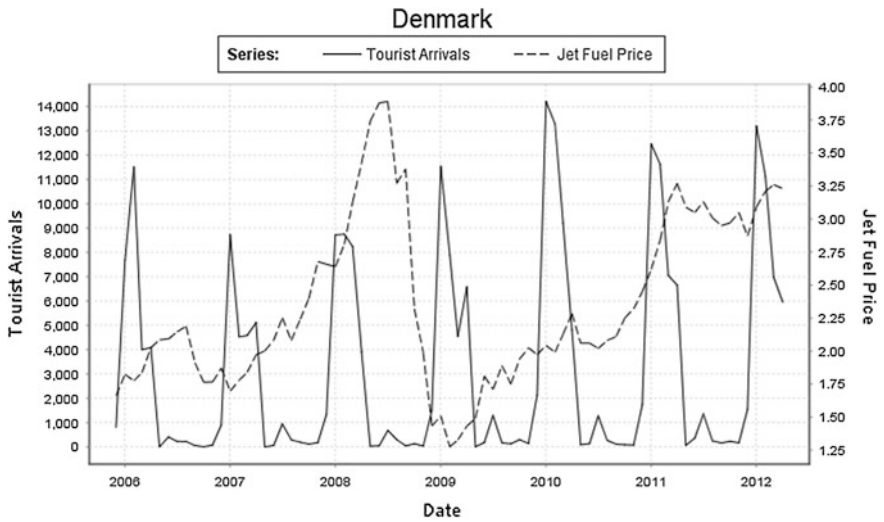

Fig. 2 Tourist arrivals and jet fuel price for sending country Denmark

is associated with a significant increase of tourist arrivals in 2010. Thus, jet fuel price can similarly be attributed with an (i.e. negative) effect on tourism demand showing a 1-year time-lag.

3.2 Data Preparation

Autoregressive prediction models use past arrival data to predict future arrivals, thus, the target attribute *tourist arrivals* has been used with different time-lags as input attributes, as well. Time-lags are also meaningful for other input attributes listed above, like web search traffic or advertising expenditures, as tourists search for information on their planned holiday in advance (cf. Fig. 1), and advertising investments will have a positive influence not necessarily on current, but more likely on future tourist arrivals.

In contrast to linear regression, most data mining techniques (e.g. k-nearest neighbour, decision trees or artificial neural networks) do not require specific statistical characteristics to hold true for the data set, e.g. non-collinearity of input attributes (Larose, 2005; Tan, Steinbach, & Kumar, 2006). Thus, when learning a prediction model, input attributes can be included in the data set for all different time-lags within a certain time window. The size of the time window has to be selected carefully in order to make sure that all relevant patterns and trends are comprised (Hastie, Tibshirani, & Friedman, 2009). In this study, a time window of 24 months has been chosen in order to cope with seasonality as well as trends over several years. Consequently, the resulting data set contains 216 input attributes (i.e.

arrivals and all other attributes discussed above at time t-1 to t-24, serving as independent or exogenous attributes) and one target attribute (i.e. arrivals at time t, serving as the dependent or endogenous attribute).

4 Model Building

This study compares an autoregressive approach (i.e. arrivals at time t are estimated based on arrivals at time t-1 to t-24) with a *big data-based* approach (i.e. arrivals at time t are estimated based on multiple input attributes (see above discussion on model attributes) at time t-1 to t-24. For both approaches, a linear regression and k-nearest-neighbour are used as estimation techniques, in order to compare statistical and data mining approaches, respectively.

Linear regression: The linear regression as a statistical approach for estimating a numeric target attribute is also well suited for predicting tourist arrivals (cf. Sect. 2). In order to avoid the inclusion of irrelevant or highly correlated input attributes into the regression model (caused by including attributes with different time-lags—cf. section data preparation above), a *forward* selection has been executed as a data-driven model building approach, successively adding the most significant attributes to the model as long as a predefined performance increase can be achieved (Hastie et al., 2009).

k-nearest neighbour (k-NN): The k-NN algorithm estimates the target attribute of a new data entry, based on the k most similar data entries within the training data set (Tan et al., 2006). In case of predicting tourist arrivals, based on time windows (cf. section data preparation), the algorithm estimates the arrivals at time t based on past points in time with the most similar input attribute values within the respective time window. This study applies the two nearest neighbours (k = 2) and the Euclidian distance measure to identify the most similar past time windows. In order to avoid an uneven influence of different input attributes on the distance calculation, a Z-score standardisation has been used for data preparation to normalize input attribute values (Larose, 2005).

Evaluation: The prediction performance of the different approaches described above is evaluated by a sliding window validation (Hastie et al., 2009). In order to avoid overfitting, i.e. a model being too specific for the data it has been learned from, the data set is divided into a training data set used for model learning, and a test data set used for model evaluation. A cross-validation would select training and test data entries randomly and, thus, would destroy the natural order of data entries. Thus, by contrast, the sliding window validation approach uses a window (or fraction) of data entries as training data and a consecutive window of data entries as test data and successively moves these two windows along the complete data set (ibid, 2009). This study used a sliding window validation with a training window size of 24 and a test window size of 12 data entries.

5 Results

The prediction of tourist arrivals has been executed autoregressively (i.e. based on past tourist arrivals alone) and based on big data-based attributes as additional model input. For both approaches, the estimation techniques linear regression and k-NN have been employed. Figure 3 shows the actual and predicted tourist arrivals for the approach of a linear regression with additional big data-based attributes, exemplarily for the sending country Denmark.

The four different prediction models have been learned and evaluated for all five sending countries, separately. Table 1 shows the root mean squared error (RMSE) and the mean absolute error (MAE) for all prediction methods, typically used as the most expressive performance measures when comparing different prediction methods on the same data set (Hastie et al., 2009).

When looking at the performance of the two applied prediction methods based on an autoregressive approach, it becomes apparent that both methods reach quite satisfactory results. In the case of the sending country Denmark, for example, the MAE of 753 arrivals for the linear regression and 509 for the k-NN constitute good results in light of an average of 3,223 arrivals and a maximum of 14,199 arrivals per month (Frechtling, 2002; Hastie et al., 2009). The performance deviation between different sending countries is simply caused by different arrival scales, e.g. Norway having 4,875 arrivals on average compared to UK with 1,082 average arrivals per month.

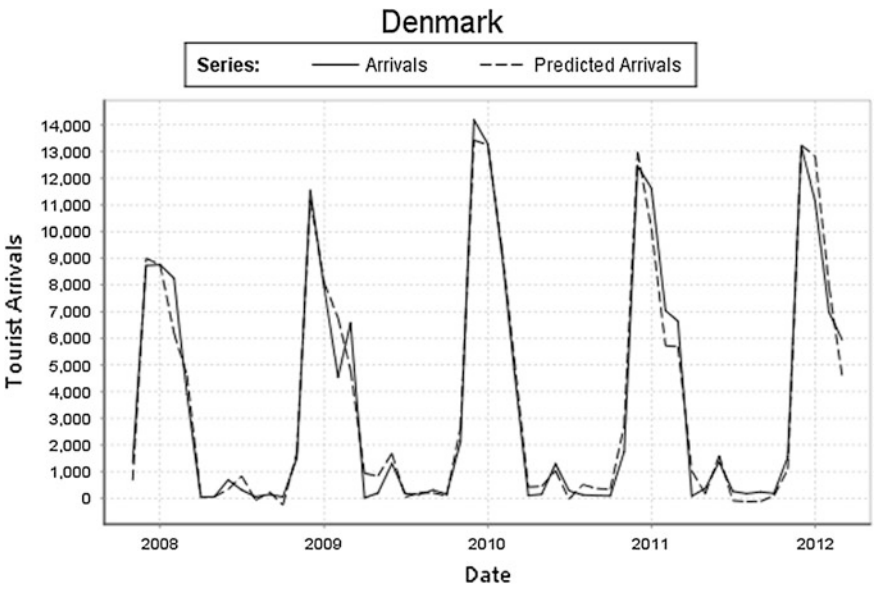

Fig. 3 Tourist arrivals and predicted arrivals for sending country Denmark

Table 1 Performance of prediction methods

Prediction method	Sending country	Autoregressive		Big data	
		RMSE	MAE	RMSE	MAE
Linear regression	Denmark	1,320.27	753.20	553.37	413.96
	Finland	1,035.21	619.40	713.11	458.23
	Norway	1,462.34	1,045.97	934.29	684.91
	Russia	1,962.57	806.64	475.02	281.86
	UK	412.59	274.77	331.91	239.89
k-NN	Denmark	812.10	509.15	653.32	360.06
	Finland	753.40	413.25	525.99	272.55
	Norway	1,725.59	1,220.95	1,687.94	1,157.65
	Russia	760.14	352.318	603.96	270.02
	UK	343.97	204.67	299.50	180.48

Comparing the autoregressive and the big data-based approach, it becomes obvious that for both prediction methods, linear regression and k-NN, adding big data information sources as additional input significantly increases the prediction performance—the linear regression benefitting much more than the k-NN. More concretely, the average MEA over all sending countries for the prediction method k-NN is reduced from 620 to 432, thus, by 30%. Interestingly enough, the big data-based information sources *web search traffic* (i.e. Google trends), *price level of alternative destinations* and *transportation costs* (i.e. jet fuel prices) show the strongest influence on tourist arrivals. Thus, research proposition 1 "*big data information sources can increase the accuracy of predicting tourist arrivals, compared to autoregressive approaches*" is supported both for statistical estimation methods as well as data mining methods, like k-NN. Additionally, using big data information sources offers the advantage of enabling a prediction of tourist arrivals under changing external conditions or singular events. In case of extraordinary changes in e.g. exchange rates or transportations costs as well as singular events, like mega sport events or natural crises or disasters, autoregressive approaches cannot take advantage of this additional knowledge in contrast to big data-based approaches. Thus, especially in extraordinary situations, big data-based tourist arrival prediction can constitute a valuable support of tourism decision making.

Comparing the two prediction methods k-NN and linear regression, first based on an autoregressive approach, k-NN clearly outperforms the linear regression. The contrary result for the sending country Norway is caused by an extreme peak of arrivals in 2010, which is better handled by the linear regression. However, over all five sending countries it can be concluded that in case of an autoregressive prediction, the data mining method k-NN is better suited than the statistical method of linear regression. When comparing the two prediction methods based on the big data approach, again k-NN outperforms the linear regression, although the difference is smaller than in the case of the autoregressive approach. Thus, similar to previous studies (Kon & Turner, 2005; Chen & Wang, 2007; Hadavandi et al.,

2011), research proposition 2 "*the data mining technique k-nearest neighbour (k-NN) achieves a higher prediction accuracy than the statistical approach linear regression*" is supported for both the autoregressive as well as the big data approach. At the same time, data mining techniques, like k-NN, are more flexible and powerful in recognizing also non-linear patterns as well as more robust against biased input data and the violation of input data prerequisites, like non-collinearity, etc. (Larose, 2005; Hastie et al., 2009).

6 Conclusion and Outlook

This study compared an autoregressive tourist arrival prediction, using only past arrivals as input attributes, with an arrival prediction based on big data information sources as additional input. More concretely, the attributes *income per capita* (i.e. GDP-based), *destination price level*, *price level of alternative destinations*, *transportation costs* (i.e. jet fuel price), *advertising expenditures*, and *web search traffic* (Google trends) have been added as input for predicting tourist arrivals. As prediction method, the study compared the statistical approach of linear regression with the data mining technique k-nearest neighbour (k-NN), which proofed to be more powerful than other data mining estimation techniques not explicitly tabled in this paper (e.g. artificial neural networks). The different approaches explained above have been executed and evaluated for the leading Swedish mountain destination Åre and corresponding arrival data and big data sources for the time period 2005–2012. All analyses and data mining processes have been executed with the data mining tool set *RapidMiner Studio*®.

The results of the study clearly show that (research proposition 1): additional big data information sources show the potential to significantly increase the accuracy to predict tourist arrivals compared to using past arrivals alone (i.e. autoregressive forecasting approach) and (research proposition 2): data mining techniques (in this case k-NN) show the potential to outperform statistical approaches, like linear regression. Additionally, data mining techniques can identify any kind of non-linear relationships between input and target attribute and are more robust against biased input data and violations of input attribute preconditions, like non-collinearity, etc. (Hastie et al., 2009).

The current study is limited on a restricted number of big data information sources, like web search traffic (i.e. Google trends data) or (macro) economic data per sending country, respectively. In future studies, therefore, additional big data information sources can be added, like, for example, web navigation data from destination or tourism supplier websites and platforms, or customer traffic data on social media platforms, like Twitter, Facebook or YouTube.

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Part IV
Virtual and Augmented Reality

Measuring the Media Effects of a Tourism-Related Virtual Reality Experience Using Biophysical Data

Elena Marchiori, Evangelos Niforatos and Luca Preto

Abstract Tourism is among the domains that might see in Virtual reality (VR) several advances for promoting its products and services. This study is one of the first that proposes the use of biophysical data for investigating the media effects of a tourism-related VR experience and discusses the use of such technique for studying media effects in VR settings. A VR experience proposed to the public by Ticino Tourism, a regional Swiss Destination Management Organization (DMO) was tested with 23 people who participated in an experiment in which biophysical reactions were tracked. Findings show that specific media characteristics of the VR experience, such as proposing an unusual horizon perspective to the VR viewer, hold the potential to lead to the formation of strong memories. These results might enable a better understanding of the effects of VR technology on consumer behaviour and eventually lead to the design of more engaging VR content.

Keywords Virtual reality · Biophysical data · Tourism destination · Destination management organization · Emotional responses

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1 Introduction

Virtual reality (VR) is a topic that is expanding rapidly both in terms of technological advances and the domains of its applications. Tourism is among the domains that might see in VR several advances for promoting its products and services (Wan, Tsaur, Chiu, & Chiou, 2007; Guttentag, 2010; Huang, Backman, K. F., Backman, S. J., & Chang, 2015). VR allows for the simulation of places and, therefore, of experience. For example, people might explore a destination that is difficult to reach and discover if an experience is worth their investment (Huang et al., 2015).

Exploring the effects of VR is an upcoming topic of research (Guttentag, 2010). Traditional research methods such as user tests, in which pre-post-test questionnaires are administered to viewers of VR, can investigate the effects of VR media, including what people understand of the content displayed during a VR experience, the possible changes in their level of awareness about the object displayed, their behavioural intentions (e.g. their willingness to visit a place), and their learning curve (e.g., what they remember over time). However, this study posits that investigating the biophysical reactions of people experiencing VR applications can provide a further understanding of the elements that most affect their memory recall and related emotions. This information might enable a better understanding of the effects of technology on consumer behaviour and eventually lead to the design of more engaging VR content.

Biophysical body reactions, such as electrodermal activity (EDA) and heart rate (HR), are considered as valid indicators for recognizing and measuring emotions and arousal levels (i.e., the intensity of an emotion) during an experience (Hamann, 2001; D'Argembeau, Comblain, & Van der Linden, 2003; Schaefer & Philippot, 2005; Shah, Su, & Veledar, 2011). A recent study applied biophysical data to investigate travellers' emotions in a natural setting (Kim & Fesenmaier, 2015), confirming the relevance of such an approach. As indicated in the study, a natural setting is sensitive to external stimuli (e.g., sounds) that are not controlled and that can create bias in the data interpretation. By contrast, a VR setting presents a different context. VR applications are generally experienced using head-mounted devices that tend to reduce the effects of external stimuli (e.g., external visual stimuli and, when earplugs are used, sounds). Thus, any detected effects on collected EDA and HR data during a VR experience can generally be attributed to the VR content displayed.

The design of the VR experience is still under research. The traditional storytelling approach has a new challenge in VR as content is displayed in a different setting where a user is the centre of the experience and decides where to look and what to look at (Lauria & Ford Morie, 2015). Indeed, a viewer might miss important elements of the story because he/she was looking in a particular direction. VR requires an articulation of its own grammar in terms of content design. At the same time, a VR solution for the tourism domain also requires its own grammar (Guttentag, 2010).

Understanding what kind of content and format should be placed where, in what manner, and at what time during a VR experience represents not only a challenge for the VR designer but also an important goal for communicators interested in using such technology to convey messages and propose new valuable experiences. Hence, this study is part of a contemporary research quest that studies VR media effects with the purpose of designing better VR content.

This study is one of the first to propose an approach for assessing users' reactions in a tourism-related VR setting based on biophysical data. A VR experience proposed to the public by Ticino Tourism, a regional Swiss Destination Management Organization (DMO), and viewed 12,857 times between June and August 2016, was tested with 23 people who participated in an experiment in which an Empatica wristband was used to track their biophysical data. The participants were followed for a month after the experience in order to evaluate their recall and their learning curve of the content displayed during the VR experience. Our expectation was that arousing VR experiences, such as the one we investigate in this work, hold the potential to successfully simulate visual and audible sensorial details that lead to the formation of strong memories. Furthermore, participants' full immersion in a VR experience while being stationary provides a strategic opportunity to examine the potential of HR as an indicator of strong memory formation.

2 Literature Review

2.1 Virtual Reality Characteristics and Tourism

Sherman and Craig (2002) underline that Virtual Reality (VR) can be considered as a medium and that its definition is still in flux. Lauria & Ford Morie elaborate on this concept, defining VR as a "metamedium—one that we call virtuality—which transcends the ability to merely statistically represent and present data, but increasingly alters our very perception of reality" (2015, p. 141). "Virtual" is defined as "existing in essence or effect though not in actual fact," while "reality" is "the state of being actual or real, the state of the world as it really is rather than as you might want it to be, the quality possessed by something that is real" (http://wordnetweb.princeton.edu). These definitions reveal the essential component of VR: experiencing a new dimension that we might consider as real. Guttentag specifies that VR can be considered as "the use of a computer-generated 3D environment—called a 'virtual environment' (VE)—that one can navigate and possibly interact with, resulting in real-time simulation of one or more of the user's five senses" (2010, p. 638). The concepts of presence and immersion are considered as key aspects of VR. Presence refers to an individual's reactions to stimuli in the environment (the virtual world) as if they were actual/real and not computer-generated, while immersion refers to the objective level of sensory fidelity (Slater, 2003). As Biocca and Nowak (2001) point

out, assessing the level of presence is a crucial aspect for VR designers and is of key importance in designing VR content.

VR content has so far been composed of many visual aspects that help to achieve sensory fidelity. In particular, the "effects of gravity on unsupported objects must be incorporated" in VR applications (Sherman & Craig, 2002; p. 52). Indeed, current VR applications offer mainly a 360° video footage and/or a 3D video reconstruction of existing places or new objects/virtual worlds. As Highton (2015) states, the horizon perspective is a key component in creating a higher level of immersion. Moreover, Earnshaw et al. point to the human brain's ability, defined as motion parallax, "to render a three dimensional mental picture of an object simply from the way it moves in relation to the eye. Rotations offer the best results because key positions located on the surface move in a larger variety of directions. Furthermore, in a perspective projection, depth perception is further accentuated by the speed in which features flow in the field of view-points located closer to the eyes move faster than the ones situated in the back" (1993, p. 148). Therefore, in VR applications, size, rotation, and speed of animated objects are considered as relevant media characteristics.

VR applications represent a valid aid for DMOs in communicating memorable experiences (Guttentag, 2010). It enables tourism managers to provide a sample of their offers and to enrich their existing marketing materials with a more vivid and engaging experience. Indeed, as confirmed by scholars (Wan et al., 2007; Guttentag, 2010; Huang et al., 2015), an increase in information about a destination can lead to more realistic expectations and, in turn, a more satisfying tourism experience. However, measuring VR effects, particularly for the tourism domain, is still a new field that requires work (Guttentag, 2010).

2.2 Emotions Recognition Using Biosensors. the Role of HR Analysis

Several studies in neuroscience and psychology have found a correlation between arousal (i.e. intensity of an emotion) during an experience and memory recall of the specifics of that experience. For example, participants who viewed arousing stories exhibited a greater emotional reaction than when viewing neutral stories, leading to better remembering the stories when they were more aroused (Hamann, 2001). Arousal was found to hold significantly more variance in autobiographical characteristics than valence (i.e. positivity or negativity of an emotion) or age of the memory per se (LaBar & Cabeza, 2006; Talarico, LaBar, & Rubin, 2004; Weinberg, Hasni, Shinohara, & Duarte, 2014). Emotional memories have been found to better support the recall of perceptual, sensory and semantic elements of an experience in comparison to neutral memories (Schaefer & Philippot, 2005), though findings are not always consistent. As such, Shah et al. (2011) found a statistical significant positive association between HR and verbal, but not visual, Story Recall Test (SRT) scores,

where in fact the most statistically significant association was found between Very Low Frequency (VLF) HR and verbal total recall SRT. This phenomenon is ascribed to the function of hippocampus, a lower area in the human brain that is strongly related to memory creation. In fact, increased blood flow as result of exercise has been found to increase the size of hippocampus and thus, improve one's memory (Erickson, Voss, & Prakash, 2011; Weinberg et al., 2014). Besides the effects of arousal, emotions and HR on memory enhancement, positive memories were found to contain more sensorial (visual, smell, taste) and contextual (location, time) details than negative or neutral events (D'Argembeau et al., 2003).

3 Research Design

The VR experience investigated in this study was about the tourism destination Ticino, which is the southernmost Canton of Switzerland. The VR experience was developed by Ticino Tourism (ticino.ch), the related Swiss regional DMO, with the support of the agency Responsive.ag, with the intention to use it as a marketing material (http://www.ticino.ch/en/campaigns/alptransit/vr.html) to promote the destination in occasion of the Gotthard tunnel opening, which occurred in June 2016. The length of the VR experience was 5.45 min, and was comprised of 11 scenes of unequal duration displaying a journey from a tunnel to the main landscapes of the destination. The VR experience under study was already introduced to the public in several events organized by the destination using three Oculus Rift, but never tested. Moreover, the same VR experience was introduced to the visitors of a transport museum in Switzerland for a limited period of time in which there was a dedicated station with two Oculus Rift displaying the same VR experience. Thus, from the launch of the VR experience (June 2016) to the end of August 2016, the VR video under study has been viewed 12,857 times (data provided by Ticino Tourism).

3.1 Research Setting

Through an advertisement done by the regional destination published on its official Facebook page that invited people from central Switzerland to test the new Virtual Reality experience of the destination under study, 23 people (4 females and 19 males) have been selected to participate in the experiment. The experiment took place on June 8, 2016 in Zurich, Switzerland. Each participant was invited at a pre-arranged time in an office hosting the experiment and equipped with two Oculus Rift. After having signed a consent form, each participant was provided with an Empatica E4 wristband, a multisensory device for real-time computerized biofeedback, synchronized with the VR video, allowing to track their physical responses to content viewed (e.g. Heart Rate—HR). In addition, to each participant

three questionnaires were administered: one immediately before the experience, one immediately after, and one approximately a month after the experience, allowing to study what has been appreciated, understood and remembered of the VR experience.

Moreover, a content analysis of the elements displayed per each scene of the VR video was performed, classifying the components of the VR media characteristics presented during the VR experience. Based on the above literature review (Sect. 2.1), the following four components were identified and coded for each scene:

- *Format of the scene*: the scene might be presented as a 360° photo or as a 3D video reconstruction.
- *Horizon perspective:* the view of the scene can be from a regular perspective (eye-level perspective) or from an unusual perspective. For an unusual perspective is intended a visual perspective where there is a tilting of the horizon lines upward or downward that can create unusual effects.
- *Animated elements in the scene*: the scene contains only static objects or presents also animated elements in the form of objects moving within the scene.
- *Sound effects*: the scene may have no sound at all, a music background, or a combination of sound alterations (e.g. sound of a train passing by).

Table 1 presents the results of the content analysis of the VR experience.

3.2 Data Analysis

Results of the content analysis of the elements displayed during the VR experience are combined with the biophysical data generated by the wristband, and with the most memorable contents/scenes, as reported by participants during the two follow-up phases. The analyses will determine if there is a correlation among the main biophysical reactions (e.g. an increase in HR), what is recalled, and specific media characteristics.

4 Results

Results showed that most of the participants had already visited the destination (20 of 23), while half of them (11 out of 23) had a prior experience with a VR headset/VR experience. Participants enjoyed in general the VR experience, reporting the following elicited feelings: happiness, excitement, being impressed and surprised. The experience has been primarily classified as informative, entertaining, and playful. The recall questionnaire administered 1 month after the

Table 1 Virtual reality media characteristics of the VR experience under study

Scene no	Scene description	Format[a]	Horizon perspective	Animated elements in the scene	Sound effects
1	Miners working on the tunnel	B	Regular	Rocks thrown by the explosion	Explosion and rocks rolling
2	Passage of the train in the tunnel	B	Unusual (aside of a train)	Train moving toward the observer	Train whistle
3	Drilling machine and explosion in the tunnel	B	Regular	Rocks thrown by the drilling machine	Drilling machine noise
4	The train passes at high speed and leads out of the tunnel	B	Unusual (aside of a train)	Train moves together with the observer	Train announcing the next stop
5	At the castles	A	Regular	Some flowers moving	Chirping of birds
6	Looking at a valley from a river side	A	Regular	Water surface movement, and a butterfly flying	River flow
7	Sitting in the middle of the square	B	Regular	A Cheetah moving on a screen	Roar of the animal
8	Flying on a hot-air balloon	B	Unusual (flying: view from top to horizon)	Movement of the hot-air balloon	Wind blow
9	Looking at a valley from a mountain peak perspective	A	From top to horizon	Bees flying	Bees buzzing
10	Sitting in a typical restaurant	B	Unusual (sitting at a table: view from top to horizon)	Light of the candles and leaves moving	Crickets chirping
11	In a boat on a lake	B	Unusual (sitting on a boat: view from ground level to horizon)	Water surface movement and fireworks	Fireworks exploding

[a]Format: A = 360 photo; B = 3D video reconstruction

experience had taken place, collected 18 answers out of 23 participants in total. Participants still recalled the experience as very positive, and classify it as informative and entertaining.

4.1 Scenes Effects on Memory Recall

Table 2 presents the results of the comparison between the self-reported description of the VR experience and the related top scenes declared by participants at time 0 (immediate after the experience), and at time 1 (1 month after the experience). To note that a person could have reported more than one aspect of the VR experience, and/or scene.

From the recall question (namely "Please describe what you have just experienced") the same three scenes have been recalled on the two follow-up phases, suggesting a relevance of those specific scenes, which were: Scene 3, Scene 8, and Scene 10. Interestingly, during the second recall phase, Scene 11 was reported but not indicated as a top scene, while in the immediate recall phase (after the experience) Scene 11 was not reported in the description but was mentioned among the top scenes. Participants who experienced VR for the first time, reported more frequently their feeling of "being there", instead of reporting what was actually displayed. We believe this is due to a novelty effect that a first VR experience imposes.

When investigating the media characteristics of the most reported and recalled scenes, as reported and recalled by the participants, it is shown that the top reported/recalled scenes were the ones characterised by an unusual horizon perspective (namely Scene 8 and 10). In fact, in both cases, the view of the scene was introduced from an unusual perspective: Scene 8 simulates a flight on a hot air balloon, while Scene 10 presents a landscape view from the balcony of a restaurant located on top of a mountain. Moreover, in both cases, there were animated elements in the scene and a particular sound (e.g. wind blow when on the balloon), which underlined the mood of the scene, suggesting how those aspects might have had an effect on participants' ability to recall a scene.

Table 2 Frequencies of self-reported mentions on the VR experience

	Follow-up time 0 (23 respondents)		Follow-up time 1 (18 respondents)	
Scene no	Self-reported description	Self-reported top scene	Self-reported description	Self-reported top scene
1	5		4	1
2				
3	9	1	9	1
4			3	
5	5	1	4	
6	2		1	
7	5		5	
8	7	11	6	9
9			2	2
10	10	4	7	3
11		4	6	1

4.2 The Role of HR on VR Characteristics

Figure 1 presents the average HR response of 23 participants throughout the duration of the VR video. As we can see, the HR level increased during the first phase of the video (corresponding to Scene 1–2–3–4), and gradually decreased during Scenes 5, only to gradually increase again during Scene 8 and 10. In Fig. 1 are underlined the correspondence of the peaks matching to the most recalled scenes, namely: Scenes No 3, 8, and 10.

In order to further investigate the role of HR on VR characteristics, participants' exhibited HRs have been grouped by 11 distinct scenes on unequal duration. Then, for estimating the effect of a scene on participants' HR, we performed a one-way repeated measures analysis of variance (one-way repeated measures ANOVA) with participants' HR as a dependent variable and scene number as an independent variable. Mauchly's Test of Sphericity indicated that the assumption of Sphericity had been violated ($\chi^2(54) = 1452.059$, $p < 0.001$) and thus, a Greenhouse-Geisser correction has been used. The analysis displayed a significant main effect of Scene on participants' exhibited HR ($F(6.536,1947.789) = 15.019$, $p < 0.001$, $\eta_p^2 = 0.048$) (see Table 2). Post hoc pairwise comparisons using the Bonferroni correction showed that participants during Scene 4 ($M = 89.747$, SD = 12.215,

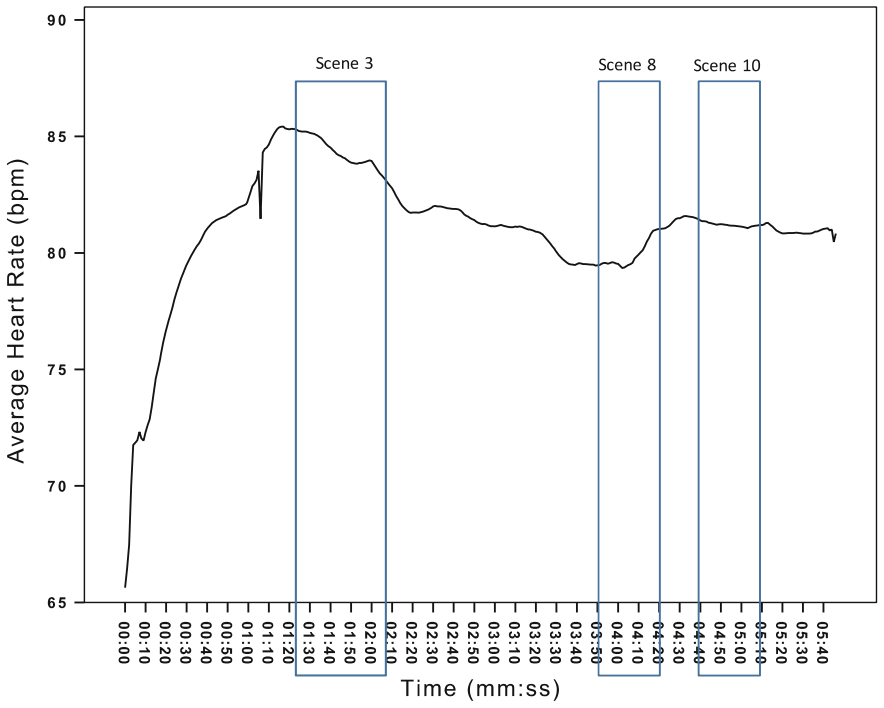

Fig. 1 Results of HR level during the duration of the VR experience

$p < 0.001$) on average systematically displayed the highest HR as opposed to all other Scenes, including Scene 2 ($M = 85.27$, SD = 17.135, $p < 0.05$), except for Scene 3 ($M = 88.611$, SD = 12.6). In fact, participants during Scene 3 ($M = 88.611$, SD = 12.6, $p < 0.05$) exhibited on average significantly higher HR than during all other scenes, except for Scene 2 ($M = 85.27$, SD = 17.135) and Scene 4 ($M = 89.747$, SD = 12.215). Furthermore, participants during Scene 8 ($M = 83.48$, SD = 12.854, $p < 0.05$) displayed on average significantly higher HR than in Scene 1 ($M = 78.765$, SD = 12.097). Similarly, participants during Scene 10 ($M = 84.397$, SD = 12.741, $p < 0.001$) displayed significantly higher HR than in Scene 1 ($M = 78.765$, SD = 12.097).

At this point, we need to note that we expect, at some extent, a "carry over" effect on currently measured participants' HR levels induced by previous temporally adjacent scenes. In other words, we expect that the HR levels exhibited and measured continuously in a previous scene may influence the HR levels measured in the next scene. In fact, in order to avoid such phenomenon from manifesting, we had to pause the VR experience every time a Scene was ended, let participants calm down for some period (e.g. 5 min) and continue with the next scene. However, this was not considered a viable option both from the perspective of time and that of quality of experience. In fact, a heavily segmented VR experience would have been perceived as disruptive and unpleasant by our participants. Hence, for example we expect that participants' HR during Scene 3 may have influenced participants' HR measured during Scene 4.

5 Conclusion

The findings of this study want to contribute to the body of knowledge on human–computer interaction applied to the tourism domain providing evidences on the use of biosensors for investigating the media effects of a tourism-related VR experience. In particular, the results contribute to the study of VR media effects, introducing techniques from neuroscience and psychology and, in particular, proposing an approach that uses HR to test VR effects.

The results show that the detected HR peaks appear to correspond to VR graphic design elements that tend to change the usual perspective of users, forcing them to focus on re-adapting their view to a new scene. These effects were generated in scenes where the viewer simulates a flight in a hot-air balloon and where a landscape is viewed from a restaurant located on the top of a mountain. The results also show that those who participate in a VR experience for the first time tend to remember and report more frequently the feeling of immersion, rather than what was actually displayed. We believe this is due to the novelty effect that a first VR experience imposes.

This case presents a VR experience that has been viewed 12,857 times between June and August 2016 during several events organized by Ticino Tourism for promoting the destination itself (e.g. in particular in occasion of the Gotthard tunnel

opening), and as a station at the transport museum. The great attention that the VR experience received by the users demonstrates the capacity of VR to generate curiosity and willingness to experience this new form of enjoying a promotion of a destination by tourists and prospects. Moreover, the length of the studied VR experience (approximately 6 min), represents a significant length for a marketing campaign. Furthermore, the setting of the VR itself represents a significant aid for a quality attention span devoted by a person to the displayed contents (e.g. a user is generally fully immersed in the virtual world with a strong reduction of external stimuli). Thus, these VR aspects represent a marketing opportunity for DMOs. Hence, DMO managers interested in proposing new experiences to their audiences using VR applications may find this study useful, as it underlines which type of content that can contribute to eliciting memorable experiences.

There are some limitations associated with this study. First, the results are from a limited sample and based on a test using a specific VR application, and so they cannot be generalized. Therefore, future research should consider enlarging the sample and testing the protocol using different tourism-related VR applications. Second, the "carry over" effect on participants' HR levels induced by temporally adjacent scenes needs to be addressed, and an ad hoc test should be considered in order to avoid this potential bias. For example, it could be changed randomly the order of scenes in order to verify the effect of randomizing carry over effects. Another limitation is related to a lack of investigation on the moderated effect of previous visits due to a small number of respondents who have not visited the destination under study. Therefore, future research should consider investigating perceptions and HR reactions of participants with a visiting experience versus a no-experience background towards the object under study, in order to control if places/experiences previously visited could be easier to recall for respondents. Future research should also consider to investigate the baseline HR of the respondents in order to verify if the VR experience represents an increase or decrease in HR compared to baseline of the respondent, and overall to further investigate the role of the HR baseline data in such protocol. A one-way ANOVA analysis with the participants' HR as a dependent variable and the four VR media characteristics as independent variables is also suggested for future research in order to identify which VR media characteristics influence on users' experience. The effects of similar content displayed using traditional formats (e.g., videos, websites, and brochures) could also be compared with those induced by a VR application in order to better assess VR's potential. Finally, the research protocol should introduce specific post-questions devoted to investigating to what extent the perceived levels of presence and immersion are associated with the content viewed during a VR experience.

Overall, this study is one of the first that proposes the use of biophysical data for investigating the media effects of a tourism-related virtual reality experience and that discusses the use of "neuromarketing" techniques for studying media effects in virtual reality settings.

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To Catch Them All—The (Un)intended Consequences of Pokémon GO on Mobility, Consumption, and Wellbeing

Florian J. Zach and Iis P. Tussyadiah

Abstract In order to better understand the effectiveness of location-based mobile games in shaping user behaviour, this study investigates the behavioural impacts of playing Pokémon GO on mobility (i.e., travel) and consumption (i.e., spending) and its effects on users' wellbeing. Based on a survey with 405 players in the United States (US), three types of impacts were identified: sense of community (social), mobility (visitation to places), and physical activities. Two dimensions of players' wellbeing were also identified: improved daily functions and psychosocial functions. Enjoyment of the game as well as motivation to win a battle were consistently found to affect these behavioural impacts. Additionally, these factors also increase the probability of players' spending money on induced consumption, such as for retail, restaurants, and travel.

Keywords Mobile gaming · Location-based game · Mobility · Travel · Consumption · Wellbeing

1 Introduction

Pokémon GO, at 500 million downloads by September 2016, brought the combination of mobile gaming and augmented reality to the masses. The game relies on smartphone's geolocation to enable gameplay, in that in-game mobility is triggered by physical travel. To succeed in the game, users have to be in the vicinity of real world locations to find and catch Pokémon characters and to interact with Gyms to battle or with PokéStops to collect necessary game items. While some of these

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items can be bought through in-app purchases, others can only be found when users are in the vicinity of a PokéStop.

Mobile games are changing the game industry significantly. At the expense of console games, smartphone games today account for 27% or $36.9 billion of the market share, up from 24% in 2015 (Newzoo, 2016). Mobile games typically generate revenue through app download and in-app purchases and can be played on a smartphone regardless of the physical location of the player. However, Pokémon GO, and the less successful predecessor Ingress, augmented the game by requiring users to be at specific geographical locations to have access to relevant game features. In Pokémon GO, PokéStops are placed at landmarks, such as statues, commemorative signs, churches, and other public places. As such, it is expected that gameplay affects users' surroundings. Furthermore, different types of Pokémon are spawned in different geographic areas, forcing players to walk and visit different areas to catch them all.

The large scale success of Pokémon GO warrants a closer look at the benefits derived for users and potential effects for businesses located near Pokéstops. Indeed, the media have speculated the impacts of the game for its users (e.g., health benefits, meeting other players at PokéStops or collaborating with players from the same team to battle at a Gym), for local businesses (e.g., increased foot traffic, induced consumption), and for cities (e.g., improved civic engagement) (e.g., Dicker, 2016; Hahn & Judkis, 2016; Walker, 2016). Importantly, the nature of gameplay in Pokémon GO also leads to consequences of mobility, leading to speculations of its benefit to travel and tourism (Abbey-Lambertz, 2016; McIntosh, 2016). Therefore, the aim of this study is to investigate the behavioural consequences of playing Pokémon GO with regards to consumption and mobility as well as its effects on players' wellbeing.

2 Behavioural Consequences of Games

The use of mobile devices affects experiences as users take advantage of new opportunities presented by various mobile applications to manage and complete their days differently (Schwanen & Kwan, 2008). For example, mobile applications that rely on geolocation data (i.e., using Geographical Positioning Systems/GPS) improve experiences in space by providing users with prompts for wayfinding and other task fulfilment (Hahn, 2012; Tussyadiah & Zach, 2012). As such, these applications can guide users to certain locations (e.g., points of interest, tourism attractions, restaurants) to enable specific behaviour (e.g., sightseeing, dining) (Tussyadiah, 2012). Furthermore, mobile game applications influence experiences by offering users the hedonic benefit of enjoyment (Nysveen, Pedersen, & Thorbjørnsen, 2005). Indeed, Okazaki, Skapa, and Grande (2008) found that intention to play mobile games can be explained by such factors as escapism and visual appeal. Game applications on smartphones exploit these drivers by offering more playful and fun activities. Location-based mobile games combine geolocation

and enjoyment to allow users to immerse in real or mixed environments by relying on their physical position and mobility to enable completion of local tasks (Klopfer & Squire, 2008). Comparably, Pokémon GO relies on enjoyment of mobile gaming and requires players to move about the physical space to advance in the game.

Importantly, due to the hedonic characteristics of play, mobile games have been suggested as an effective behavioural intervention tool in different areas, such as healthcare (e.g., Chittaro & Sioni, 2012; Klasnja & Pratt, 2012) and education (e.g., Klopfer & Squire, 2008; Sintoris et al., 2010). By adding a factor of enjoyment to certain activities, mobile games are designed to target attitude change and, in turn, shape players' behaviour. For example, it is generally acknowledged that physical activity has a beneficial effect on health (Penedo & Dahn, 2005). To that end, various mobile games were designed to support physical activities such as walking and running in order to promote a healthier lifestyle (e.g., Chittaro & Sioni, 2012). Studies also found that electronic games that respond to players' movements (e.g., Nintendo Wii) can be used for rehabilitation purposes. In education, location-based mobile games provide playful learning activities to instil motivation among students to interact more meaningfully with cultural spaces, using the games to link physical artefacts with abstract cultural concepts (Sintoris et al., 2010). Similarly, the integration of games (and gamified applications) into tourism experience has been suggested as effective in shaping tourists' motivation and behaviour (e.g., Ballagas, Kuntze, & Walz, 2008; Bulencea & Egger, 2015; Negruşa Toader, Sofică, Tutunea, & Rus, 2015; Xu, Tian, Buhalis, Weber, & Zhang, 2015). Indeed, mobile games have been developed to increase tourists' motivation to explore tourism destinations, influence tourists' paths throughout a destination, and encourage a higher level of engagement with tourism destinations (Ballagas et al., 2008; Xu et al., 2015).

Behaviour change through games stems from players' enhanced skills by receiving feedback from the game and efficacy in engaging in the new game-driven behaviour (Baranowski, Buday, Thompson, & Baranowski, 2008). As consumer behaviour is typically goal directed (Bagozzi & Dholakia, 1999), setting goals focuses players on following the new behaviour to be successful (Ryan, Rigby, & Przybylsk 2006). To advance in Pokémon GO (i.e., to collect experience points), players need to walk to reach a PokéStop or a Gym to collect items, catch Pokémon, or battle. As such, with the goal of catching Pokémon and winning Gym battles, the game induces players to travel to places with a high concentration of PokéStops and Gyms. While it is less about building skills (as in sports), it is expected that players continue to engage in the game-driven behaviour (i.e., walking, exploring), which will lead to physical and mental fitness (Morin, 2016; Villeneuve, 2016). As such, tourism destinations can utilize the game feedback (e.g., spawning of rare Pokémon) to induce targeted behavioural outcomes: visitation and consumption of places.

Furthermore, to add an element of fun, mobile games typically build the targeted behaviour around (fantasy) storylines and interactive features (Baranowski et al., 2008). In tourism, previous studies suggested that storytelling creates extraordinary experiences that visitors recall (Mossberg, 2008; Tung & Ritchie, 2011). Taking

advantage of mobile games, tourism destinations can offer tourists with a storyline that matches the destination image to create memorable tourism experiences. Finally, location-based mobile games are expected to cast an impact on the immediate surroundings. Indeed, Pokémon GO affects businesses and individuals around PokéStops and Gyms by generating an influx of visitations to public places and patrons to local businesses. For example, upon release of the game in Japan, the game maker collaborated with McDonalds to place PokéStops near its restaurants. Therefore, this study proposes that mobile games requiring physical movements between geolocations affect player behaviour and business patronage.

3 Method

A questionnaire was developed to gauge information with regards to patterns and behavioural consequences of playing Pokémon GO. To measure behavioural consequences, statements relevant to suggested impacts of Pokémon GO found on various news outlets (via Google's news search) up to July 20th, 2016 were presented in the questionnaire. In order to measure enjoyment of the game, respondents were asked to evaluate the game using 18 bipolar statements from the Physical Activity Enjoyment Scale (PACES, Kendzierski & DeCarlo, 1991). The questionnaire also includes questions regarding spending while playing the game. The questionnaire was distributed to US-based Amazon Mechanical Turk users with a 99% approval rating on August 1st, 2016 when the game was available for download for about 4 weeks. This effort resulted in 405 responses. Respondents are 50% female, mostly younger (53% between 25 and 34 years of age), mostly college-educated (50% have at least a Bachelor Degree), and with household income less than US$ 60,000 (about 65%). The top five states of residence are California (12.4%), Florida (8.7%), Texas (8.4%), Pennsylvania (7.2%), and New York (6.9%). About half of respondents were below Level 10 trainers on Pokémon GO at the time of taking the survey, with 17% below Level 5 (i.e., beginners). About 5% were at Level 20 or higher.

4 Findings

Motivation. Respondents were asked to rate the importance of various achievements as designed in the gameplay, including to level up (moving up to a higher level), catching as many Pokémon as possible, finding rare Pokémon, winning Gym battles, taking over Gyms from other teams, etc. Two main motivations were identified from the dataset: (1) catching Pokémon (consisting of catching as many Pokémon and catching rare Pokémon) (*Mean* = 2.32, *SD* = 1.13) and (2) winning

battles (consisting of supporting own team Gyms and taking over other teams' Gyms) (*Mean* = 3.34, *SD* = 1.10).

Play. The majority of respondents (38%) reported playing the game every day, followed by 2–3 times a week (27%) and 4–6 times a week (19%). About 20% of respondents reported playing for at least 2 hours on any given day, while about 39% reported playing for less than 30 min. When asked to indicate their perceived intensity of play (from 1—"far too little" to 5—"far too much"); responses were relatively neutral (*Mean* = 3.28, *SD* = 0.884). As of now, for the sole purpose of playing the game, 47% of respondents reported walking and 47% driving beyond their neighbourhood. Only about 10% reported taking a daytrip to other cities and 4% traveling to and staying overnight in other cities to play Pokémon GO. When asked about future plans, 44% of them stated that they plan to take a daytrip and 46% plan to travel to and stay overnight in other regions for the sole purpose of playing the game, indicating the significant potential of gaming impacts for the travel and tourism industry.

Enjoyment. Reponses to all items in the PACES scale are consistently positive, with mean values ranging from 3.34 (for "*I felt as though I would rather be doing something else.*"—"*I felt as though there is nothing else I would rather be doing.*") to 4.33 (for "*I dislike it.*"—"*I like it.*"). The overall mean for enjoyment of Pokémon GO is 4.00 (*SD* = 0.71). The construct explains 61% of variance in the dataset with Cronbach's Alpha value of 0.959, indicating internal consistency.

Money Spent. A low number of respondents reported spending money for in-app purchases (18%). However, as consequences of playing the game, they reported spending money for unplanned consumption while catching Pokémon, typically at local businesses located next to PokéStops, such as for goods at retail outlets (11%), food and beverage at restaurants (29%), services (13%), and traveling (17%). These are the local businesses, retail outlets and restaurants that the respondents would not have visited otherwise.

Behavioural Consequences. Factor analysis on perceived behavioural consequences of playing Pokémon Go yielded three factors, accounting for 77% of variance in the dataset (see Table 1). The first factor (*Community/Social*) represents social interactions and sense of belonging to a community or a generation. The second factor (*Travel/Visitation*) reflects patterns of visitation to different places in the neighbourhood. The third factor includes intensity of physical activities (*Physical Activities*). Seven items were eliminated from the pool due to low factor loadings (less than 0.4) or significant cross-loadings to more than one factor. The values of Cronbach's Alpha for the three factors support the internal consistency.

Impacts on Wellbeing. Factor analysis with perceived impacts of playing Pokémon GO on personal wellbeing yielded two factors, accounting for 81% of variance in the dataset (see Table 2): (1) *Daily functions* reflects improvement in day-to-day functions (eat, sleep, work, etc.) and (2) *Psychosocial functions* reflects

Table 1 Perceived behavioural consequences of play

Perceived behavioural consequences	Factor loading	Eigen-value	Cum. %	Cronbach's Alpha
Community/Social		5.279	52.789	0.828
… I feel a strong sense of belonging to a community	0.854			
… I interact more with strangers	0.777			
… I feel a strong sense of belonging to a generation	0.750			
… I spend more time with my friends/family	0.666			
Travel/Visitation		1.235	65.143	0.905
… I visit places in my area/neighbourhood that I have never visited before	0.894			
… I visit places in my area/neighbourhood that I would not visit otherwise	0.859			
… I visit places in my area/neighbourhood that I rarely visit	0.811			
Physical activity		1.183	76.972	0.897
… I walk much more	0.876			
… I spend more time outdoors	0.869			
… I am more physically active	0.797			

Table 2 Perceived impacts of play on personal wellbeing

Perceived impacts on well-being	Factor loading	Eigen-value	Cum. %	Cronbach's Alpha
Daily functions		5.017	62.718	0.951
… I perform better at work	0.908			
… I eat better	0.898			
… I manage my home better	0.897			
… I sleep (rest) better	0.887			
Psychosocial functions		1.484	81.271	0.886
… improves my communication	0.875			
… improves my social interactions	0.875			
… increases my alertness (active attention)	0.799			
… improves my emotions	0.747			

improvement in cognition, emotion, and communication. Cronbach's Alpha values of the two constructs are higher than 0.70, indicating internal consistency.

Table 3 presents the correlations among the perceived behavioural consequences of playing Pokémon GO and perceived impacts on personal wellbeing. Strong positive correlations were found between the variables, notably between

Table 3 Correlation matrix: perceived impacts of Pokémon GO

Variables	Mean (SD)	Correlation			
		(1)	(2)	(3)	(4)
(1) Community/Social	3.18 (1.00)	1			
(2) Travel/Visitation	3.38 (1.11)	0.527***	1		
(3) Physical activity	3.90 (0.93)	0.533***	0.530***	1	
(4) Daily functions	3.22 (1.01)	0.744***	0.492***	0.505***	1
(5) Psychosocial functions	2.56 (1.00)	0.524***	0.330***	0.396***	0.543***

Note *** significant at $p < 0.001$

community/social impacts and perceived improvements of performance ($r = 0.744$, $p = 0.000$).

Determinants of Perceived Impacts. Regression analyses were conducted to assess the influence of game motivation and enjoyment on perceived impacts of playing the game, including behavioural consequences and impacts on wellbeing. In order to assess the influence of play, dummy variables representing frequency and intensity of play were also included in the analyses. The correlation matrix between motivation, enjoyment, and impacts is presented in Table 4.

The results of regression analyses with the three perceived behavioural consequences of playing Pokémon GO are presented in Table 5. All models are statistically significant, independent variables explaining 28% of the variability in Community/Social, 17% in Travel/Visitation, and 18% in Physical Activity (based on R^2 values). The analysis revealed consistent significant effects of Enjoyment on all perceived behavioural consequences of playing the game. Significant effects of Winning Battle were found on Community/Social and Travel/Visitation. Catching Pokémon significantly influences Physical Activity. In terms of dummy variable, the analyses only reveal a statistically significant effect of higher duration of play on Travel/Visitation.

Table 4 Correlation matrix: motivation, enjoyment, and impacts

Variables	Correlation		
	(1)	(2)	(3)
(1) Motive: Catching Pokémon	1		
(2) Motive: Winning Battle	0.441***	1	
(3) Enjoyment	0.528***	0.401***	1
(4) Community/social	0.351***	0.391***	0.477***
(5) Travel/visitation	0.280***	0.295***	0.359***
(6) Physical activity	0.411***	0.285***	0.499***
(7) Daily functions	0.334***	0.458***	0.544***
(8) Psychosocial functions	0.208***	0.290***	0.380***

Note *** significant at $p < 0.001$

Table 5 Regression analyses on perceived behavioural consequences

	Community/Social	Travel/Visitation	Physical activity
R^2	0.281	0.169	0.282
F	31.070 (0.000)	16.202 (0.000)	31.315 (0.000)
Independent variables			
Motive: Catching Pokémon	0.062 (0.246)	0.057 (0.317)	0.180 (0.001)
Motive: Winning Battle	0.213 (0.000)	0.150 (0.005)	0.045 (0.359)
Enjoyment	0.346 (0.000)	0.234 (0.000)	0.367 (0.000)
Play daily (dummy)	−0.019 (0.697)	0.007 (0.888)	0.021 (0.661)
Play 1 h or more (dummy)	0.063 (0.179)	0.102 (0.042)	0.032 (0.486)

The results from regression analyses on perceived impacts on wellbeing are presented in Table 6. The models are statistically significant; R^2 values indicate that the independent variables explain 37% variability in Daily Functions and 16% in Psychosocial Functions. The analyses show consistent significant effects of Winning Battle and Enjoyment on both dependent variables: increasing motivation to win battles at the Gyms and increasing enjoyment are associated with increase in perception that playing the game has improved players' Daily and Psychosocial Functions.

Determinants of Spending Money. Logistic regression analyses were performed to ascertain the effects of game motivation, enjoyment, frequency and intensity of play on the likelihood that respondents spent money on goods, food and beverage, and travel, as consequences of playing Pokémon GO. The results are as follow:

- *Spending money on goods at retail outlets*. The logistic regression model was significant with χ^2 (5) = 23.038 (0.000). The model explained 10% (Nagelkerke R^2) of the variance in dependent variable and correctly classified 86.5% of cases. Significant effects of winning battle and enjoyment were found.
- *Spending money on food and beverage at restaurants*. The logistic regression model was significant with χ^2 (5) = 37.765 (0.000). The model explained 29%

Table 6 Regression analyses on perceived impacts on wellbeing

	Impact 1: daily functions	Impact 2: psychosocial functions
R^2	0.367	0.159
F	46.069 (0.000)	16.207 (0.000)
Independent variables—Beta (p)		
Motive: Catching Pokémon	−0.033 (0.514)	−0.045 (0.437)
Motive: Winning battle	0.286 (0.000)	0.172 (0.001)
Enjoyment	0.437 (0.000)	0.336 (0.000)
Play daily (dummy)	−0.023 (0.604)	0.032 (0.528)
Play 1 h or more (dummy)	0.057 (0.190)	0.034 (0.496)

(Nagelkerke R^2) of the variance in dependent variable and correctly classified 67% of cases. Significant effects of winning battle and enjoyment were found.

- *Spending money on travelling*. The logistic regression model was significant with χ^2 (5) = 31.103 (0.000). The model explained 10% (Nagelkerke R^2) of the variance in dependent variable and correctly classified 79% of cases. Significant effects of enjoyment and playing 1 hour or more were found. Respondents who play 1 hour or more are less likely to spend money on traveling for the game (odd ratio = 0.486).

5 Conclusion and Recommendation

This study contributes to our understanding of the effects of playing mobile games that require the player to interact with their environment. The majority of respondents indicated that they move beyond their neighbourhoods to play the game and nearly half of them indicated that they are planning to take a daytrip to or stay overnight in other areas for the sole purpose of playing the game. This demonstrates the impacts the game has in shaping travel motivations among its players. Three behavioural consequences of playing the game are feeling of community (e.g., feeling the connection with other players), travel and visitation (mobility), and physical activity. Based on a series of regression analyses, it was found that enjoyment of the game significantly results in the feeling of community, increases travel and visitation to other geographic areas, and increases physical activities outdoors. Additionally, the motivation to win Gym battles (i.e., letting own Pokémon to battle other's) also positively influences the sense of community and encourages travel. In terms of wellbeing, two dimensions of players' wellbeing were identified: daily and psychosocial functions. Enjoyment of the game was found to positively influence daily and psychosocial functions of its users. Similar effects were also found from motivation to win battles. In terms of spending, it was found that increasing motivation to win battle and enjoyment are associated with increasing probability of spending money on goods (at retail shops), on food and beverages (at restaurants), and on travel.

Previously, playing electronic games were identified to be useful to pass time and to compete with friends in the case of mobile games or to advance physical rehabilitation in the case of console games with motion-based controllers. This study provides empirical support that playing mobile games that require interaction with geographical locations can have positive consequences to funnel consumer behaviour into certain activities (e.g., staying physically active, visiting places beyond own neighbourhoods) and induce spending that, in turn, affect the immediate environment. From a theoretical point of view, the study provides a better understanding of the relationships between enjoyment of a game and the behavioural consequences of playing the game, supporting the effectiveness of gaming as a behavioural intervention tool. From a managerial point of view, it can be

suggested that marketers and decision makers can capitalize on this success by designing game feedback to induce targeted behaviour. Tourism decision makers can use the underlying concept to create destination specific games that move visitors through a destination. Visitors can be guided to locations within the destination, thus allowing control of visitor flow, providing educational information, and creating memorable experiences. For example, the REXplorer engaged visitors through a game to interact with "spirits" to explore the city of Regensburg. Similar to Pokémon GO, players had to walk and could interact with the game at certain locations (Ballagas et al. 2008).

While the results are useful to better understand the consequences of games on mobility and consumption, it is noteworthy that the study was conducted shortly after the introduction of the game. The novelty of the game might cause bias in the results due to: (1) respondents were highly motivated to play the game causing inflation in perceived enjoyment or (2) respondents were in a learning process and unaware of the full potential of the game. Future research should address these issues.

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Virtual Reality and Attitudes Toward Tourism Destinations

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Abstract Recent developments in Virtual Reality (VR) technology present a tremendous opportunity for the tourism industry. This research aims to better understand how the VR experience may influence travel decision making by investigating spatial presence in VR environments and its impact on attitudes toward tourism destinations. Based on a study involving virtual walkthrough of tourism destinations with 202 participants, two dimensions of spatial presence were identified: being somewhere other than the actual environment and self-location in a VR environment. The analysis revealed that users' attention allocation to VR environments contributed significantly to spatial presence. It was also found that spatial presence positively affects post VR attitude change toward tourism destinations, indicating the persuasiveness of VR. No significant differences were found across VR stimuli (devices) and across prior visitation.

Keywords Virtual reality · Spatial presence · Attitude change · Virtual tourism · Non-travel

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1 Introduction

Virtual reality (VR) is touted to be one of the important contemporary technological developments to greatly impact the tourism industry. While VR has been around since the late 1960s, recent developments in VR platforms, devices, and hypermedia content production tools have allowed for the technology to emerge from the shadows into the realm of everyday experiences. The (potential) roles of VR in tourism management and marketing have been discussed in tourism literature (e.g., Cheong, 1995; Dewailly, 1999; Guttentag, 2010; Huang, Backman, Backman, & Chang, 2016; Williams & Hobson, 1995). VR has been suggested as a substitute for travel and tourism products (i.e., a substitution for actual visitation) (Cheong, 1995), making it beneficial for the management of protected areas, such as natural and cultural heritage sites (i.e., to limit the number of tourists or restrict visitation), and, thus, a positive contributor to sustainability (Dewailly, 1999). Recent innovations in VR offer unbounded potential for mass virtual visitation to actual tourism destinations. The availability of low cost VR devices and the abundance of tourism-related VR content make it easier for people to experience virtual tours of tourist cities and attractions. Studies also argue that VR is a powerful tourism marketing tool (Huang et al., 2016; Williams & Hobson, 1995; Williams, 2006). It provides marketers opportunities to offer more compelling imagery of tourism destinations to potential tourists by giving them a sense of what it is like to be there, a "try before you buy" experience.

As VR provides an environment in which users can retrieve information via multi-sensory (e.g., visual, auditory and kinaesthetic) modalities, users are able to perceive realistic representation of the environment it portrays (Slater & Usoh, 1993). Consequently, the immersive nature of the VR experience has been identified as a means to facilitate consumer learning of products (Suh & Lee, 2005), increase brand recognition, product recall, and memory of experiences (Kim & Biocca, 1997; Mania & Chalmers, 2001), and generate positive attitude and behavioural responses. Importantly, an immersive VR experience allows users to perceive a sense of being in the virtual environment, a perception of presence (Slater & Usoh, 1993; Steuer, 1992), which is key to the effectiveness of persuasive VR content. Indeed, literature in VR has focused on theorizing presence and conceptualizing its determinants, correlates, covariates, and consequences in various contexts, such as in education, healthcare, entertainment, retailing, etc. (e.g., Burke, 1996; Mania & Chalmers, 2001; Steuer, 1992). However, these studies, as well as VR studies in tourism context (e.g., Huang et al., 2016), mainly dealt with simulated virtual worlds where resemblances to real places were coincidental (e.g., virtual seminar room, 3D tourism attractions).

From a theoretical point of view, researching VR experience with actual tourism destinations will provide: (1) a better understanding of presence in VR experiences involving virtual depictions of real environments where possible actions resemble actual consumption (e.g., sightseeing) and (2) a conceptualization of the role of the VR experience in shaping attitudes toward actual consumption (i.e., visitation).

From a managerial point of view, as destinations are faced with strategic decisions about investment in different VR platforms and modalities, understanding how travel consumers respond to various VR stimuli (i.e., attitudinal consequences of "having been" to a destination) is of practical importance. Therefore, the aim of this study is to investigate the perceived spatial presence during a virtual walkthrough of a tourism destination and how it influences users' attitude toward the destination.

2 Theoretical Foundation

The discussion of the persuasiveness of VR experiences is centred on presence theory. Presence is understood as the psychological state in which media users feel lost or immersed in the mediated environment; the degree to which users feel that they are somewhere other than the actual environment (Slater & Usoh, 1993). As VR environments facilitate sensory and motor engagement (e.g., moving head allows changes in point of view, walking or haptic feedback enables navigation in VR environment), they allow users to perceive vivid mental representations of the mediated spaces (e.g., tourist cities) and, thus, enhance the feeling of embodiment (Wirth et al., 2007). Slater, Usoh, and Steed (1994) used a navigation metaphor of presence in virtual environment, which includes the user's sense of being there and the locality of the virtual environment. Using the transportation metaphor, Kim and Biocca (1997) operationalized presence as having two dimensions: arrival (i.e., a feeling of being present in the mediated environment) and departure (i.e., a feeling of separation from the physical environment). Finally, Wirth et al. (2007) associated spatial presence with two dimensions: self-location (i.e., the feeling of being located in mediated environments) and, in most cases, perceived action possibilities. Recent studies apply the aforementioned definitions of presence in various contexts (e.g., Weibel et al., 2015; Leonardis, Frisoli, Barsotti, Carrozzino, & Bergamasco 2014). This study defines presence as the users' perception of self-location in a VR environment and separation from the actual environment.

Previous studies have identified various factors that contribute to spatial presence, including those associated with the users. Spatial ability, which is an individual's ability to produce vivid spatial images in his/her mind, has been suggested as an important factor influencing spatial presence. For example, when presented with a blueprint of a building, individuals with higher spatial ability will be able to imagine the structure of the building easily. Wirth et al. (2007) argue that spatial ability may contribute to the formation of spatial representation of the mediated environment in VR experiences. That is, users with higher spatial visual imagery may find it easier to imagine the VR environment and fill in missing spatial information from their memory (Wirth et al., 2007). Therefore, it can be suggested that users' spatial ability contributes to the feeling of presence in the VR environment.

H1 Spatial Ability has a positive effect on sense of Presence during the VR experience.

Another important user factor contributing to presence is (user-controlled) attention during the VR experience. In order for users to interact with VR environments, they must allocate sufficient attentional resources to objects and events within the VR environments (Bystrom, Barfield, & Hendrix, 1999; Draper, Kaber, & Usher, 1998). Wirth et al. (2007) suggest that only those who pay attention to the VR environment will experience spatial presence. That is, a greater allocation of attentional resources to the VR environment will bring about a higher sense of presence (Bystrom et al., 1999; Weibel et al., 2015); distractions to users' attention to the VR environments will diminish the feeling of presence (Draper et al., 1998).

H2 Attention Allocation has a positive effect on sense of Presence during VR experience.

Research has shown that sense of presence in the VR environment has positive consequences on user behaviour. Indeed, the key propositions and findings in VR research suggest that an enhanced sense of reality with VR generates positive effects on attitude, belief, and intention (Kim & Biocca, 1997; Suh & Lee, 2005). For example, Klein (2003) identified that (tele)presence positively influences consumer attitude towards products advertised in computer-mediated environments. In the context of tourism, Hyun and O'Keefe (2012) found that (tele)presence via web-mediated information directly leads to positive virtual destination image. Therefore, it can be suggested that a higher sense of presence in the VR environment will result in positive attitude toward tourism destinations.

H3 Sense of Presence during the VR experience has a positive effect on Post VR Attitude Change toward destination.

Literature has also explored the role of media affordance in facilitating presence and its consequences. Wirth et al. (2007) suggest that users respond to highly immersive technology with strong feelings of spatial presence. VR environments that synchronously stimulate several sensory channels (e.g., visual, auditory, haptic) are more likely to cause users to feel that they are in the mediated environment (Wirth et al., 2007). For example, Ruddle, Payne, and Jones (1999) identified differences between users navigating VR environments using helmet-mounted displays and those using desktop displays, in that the more natural interaction with the helmet-mounted display results in more accurate space orientation. Therefore, it can be suggested that different immersive capabilities of VR devices (e.g., head-mounted Samsung Gear VR vs. hand-held Google Cardboard) and the stimuli they presented (e.g., street view vs. realistic video), which influence the nature of user interaction, will result in different degrees of presence and, in turn, attitude change toward destinations.

H4 The sense of Presence during the VR experience will vary according to different types of VR stimuli.

H5 The degree of Post VR Attitude Change will vary according to different types of VR stimuli.

Users' prior experience with tourism destinations (i.e., prior visitation) plays a role in VR experience of the destinations. Memory of first-hand experiences with the actual environment (i.e., prior knowledge of the space) can serve as a reference in perceiving the mental representation of the VR environment, which will influence the sense of spatial presence during the VR experience. Therefore, it is expected that the sense of presence and, consequently, attitude change toward tourism destination after VR experience will vary between users who have visited the destination and those who have not.

H6 The sense of Presence during the VR experience will vary according to Prior Visitation to destination.

H7 The degree of Post VR Attitude Change will vary according to Prior Visitation to destination.

3 Method

A questionnaire was developed to test the hypothesized relationships between Spatial Ability, Attention Allocation, Spatial Presence, and post VR Attitude Change. In order to measure Spatial Presence, presence scales from SUS questionnaire (Slater et al., 1994), telepresence (Kim & Biocca, 1997), and MEC Spatial Presence Questionnaire (MEC-SPQ; Vorderer et al., 2004) were included (a total of 22 items). Spatial Ability (four items) and Attention Allocation (four items) were measured using MEC-SPQ (Vorderer et al., 2004). These were measured using a 5-point Likert-type scale with Strongly Disagree—Strongly Agree anchored statements. The scale for Post VR Attitude Change targeted perceived changes in liking, preference, and interest in the destination (from 1—"Much Weaker" to 5—"Much Stronger").

Recent studies have found that the younger the customers, the more likely they are to be interested in VR (eMarketer, 2015; Global Web Index, 2016). To represent the group of customers who are highly likely to experience and be influenced by VR, undergraduate and graduate students were invited to participate in the study. In order to ground this research in the context of personal use of VR, existing VR applications and personal VR devices were used. Participants with Apple iOS smartphones were asked to download the Cardboard app and use Google Cardboard VR viewer to visit Tokyo, Japan (i.e., street view stimuli). Others were asked to use Samsung Gear VR (with a Samsung smartphone) to experience Porto, Portugal (i.e., video stimuli). After the VR experience, all participants were asked to complete the questionnaire online. In order to test the hypotheses, data were analysed using factor analysis and analysis of variance (ANOVA).

4 Findings

A total of 202 participants completed the questionnaire. The majority of participants are between the ages of 18 and 24 (97%), female (80%), and have a 4-Year University Degree (76%). Most participants ($N = 136$; 67%) used Google Cardboard, and most had never visited the destination portrayed in the VR experience ($N = 144$; 71%).

Dimensions of Presence. Factor analysis was performed to identify the dimensions of presence during the VR experience. As presented in Table 1, two dimensions were identified, each with four items, explaining 80% of variance in the data. These factors were labelled as Departure and Self-Location. The factor loadings of all items are higher than 0.80. Cronbach's alpha values for both factors are higher than 0.90, indicating internal consistency of the factors. The first factor, Departure, reflects the state of mind of respondents during the VR experience, whereby the sense of being in the VR environment was stronger than being in the actual environment. This is consistent with the concept of spatial presence as "being there" (i.e., destination) as opposed to "being here" (i.e., experiment room) (Kim & Biocca, 1997; Slater et al., 1994). Self-Location represents the sensing of presence and actions of self in the VR environment, which is consistent with MEC-SPQ's (Vorderer et al., 2004) self-location scale. None of the items representing Locality (Slater et al., 1994) or Possible Actions (Vorderer et al., 2004) emerged as meaningful factors; items were eliminated due to cross-loadings or low factor loadings.

Table 1 Dimensions of presence

Presence	Factor loading	Eigen-value	Cum. %	Alpha
Factor 1: Departure		3.260	40.752	0.922
During the VR experience, the sense of being in VR environment was stronger than being elsewhere	0.894			
During the VR experience, there were times when I felt I was actually there	0.831			
During the VR experience, I felt the sense of being there	0.830			
During the VR experience, I often thought to myself that I was actually there	0.827			
Factor 2: Self-location		3.172	80.403	0.912
It seemed as though I actually took part in the action (sightseeing)	0.860			
I felt like I was actually in the VR environment	0.855			
I felt as though I was physically present in the VR environment	0.821			
It was as though my location had shifted into the VR environment	0.800			

Table 2 Between-subjects effects on departure

	Type III sum of squares	df	Mean square	F	Sig.	Effect size
Corrected model	62.951	5	12.590	18.199	0.000	0.319
Intercept	1.677	1	1.677	2.245	0.121	0.012
Attention allocation	54.273	1	54.273	78.450	0.000	0.288
Spatial ability	1.310	1	1.310	1.894	0.170	0.010
Device/Stimuli	0.951	1	0.951	1.374	0.243	0.007
Prior visitation	0.000	1	0.000	0.982	0.982	0.000
Device X prior visitation	0.106	1	0.106	0.154	0.695	0.001
Error	134.211	194	464			
Total	2078.563	200				
Corrected total	156.090	199				

Factors Influencing Presence. Two-way, between-subjects ANOVAs were performed to assess the effects of Attention Allocation and Spatial Ability (as covariates), as well as Types of VR Stimuli (i.e., Google Cardboard/Tokyo vs. Samsung Gear VR/Porto), Prior Visitation (visited vs. never visited), and interaction between Types of VR Stimuli and Prior Visitation on Departure and Self-Location. As illustrated in Table 2, the results revealed the significant influence of Attention Allocation on Departure (Effect Size = 0.288, $p = 0.000$; $R^2 = 0.319$). However, the other factors were not significant. It can be suggested that the higher the level of attention devoted to the VR experience, the greater the extent of perceived departure from the physical environment. Figure 1 illustrates the estimated marginal means of Departure with different Types of VR Stimuli and Prior Visitation. Even though there are mean differences between these groups (i.e., respondents using Samsung Gear VR reporting higher presence, especially among those who had never visited the destination), these differences are not statistically significant.

Table 3 presents the results of a two-way, between-subjects ANOVA to identify the effects of Attention Allocation, Spatial Ability, Types of VR Stimuli, and Prior Visitation on Self-Location. The results revealed the significant influences of

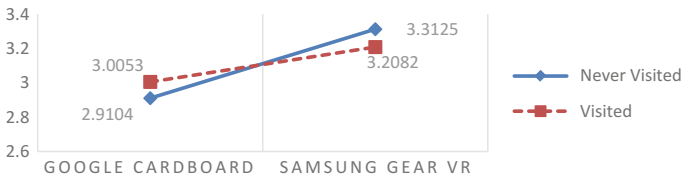

Fig. 1 Estimated marginal means of departure. *Note* Covariates are evaluated at: Attention Allocation = 3.575, Spatial Ability = 3.243

Table 3 Between-subjects effects on self-location

	Type III sum of squares	df	Mean square	F	Sig.	Effect size
Corrected model	66.023	5	13.205	28.442	0.000	0.423
Intercept	2.560	1	2.560	5.515	0.020	0.028
Attention allocation	62.575	1	62.575	134.783	0.000	0.410
Spatial ability	0.642	1	0.642	1.382	0.241	0.007
Device/Stimuli	0.055	1	0.055	0.008	0.731	0.001
Prior visitation	0.294	1	0.294	0.633	0.427	0.003
Device X prior visitation	0.045	1	0.045	0.097	0.756	0.000
Error	90.067	194	464			
Total	2351.174	200				
Corrected total	156.090	199				

Attention Allocation on Self-Location (Effect Size = 0.410, $p = 0.000$; $R^2 = 0.423$). However, the other factors were not significant. Similar to the other dimension of presence, it can be suggested that when respondents are focusing their attention during the VR experience, they are more likely to feel a stronger sense of locating the self in the VR environment. Figure 2 illustrates the estimated marginal means of Self-Location with different Types of VR Stimuli and Prior Visitation. It can be observed that among those who had never visited the destination, the use of Samsung Gear VR yielded higher level of perceived self-location. However, the mean difference is not statistically significant.

Presence Influence on Attitude Change. A two-way, between-subjects ANOVA was also performed to test the influence of Departure and Self-Location on post-VR Attitude Change toward a destination. The effects of Types of VR Stimuli and Prior Visitation were also estimated (see Table 4). Significant influences of Departure (Effect Size = 0.022, p = 0.035) and Self-Location (Effect Size = 0.039, p = 0.006) were identified ($R^2 = 0.184$), even though the effect sizes are small. Other factors are not significant. It can be suggested that spatial presence contributes to positive attitude change toward tourism destinations. Figure 3 presents the estimated marginal means of Attitude Change with different Types of VR

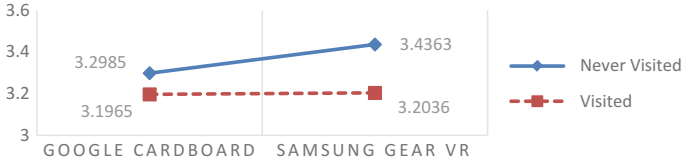

Fig. 2 Estimated marginal means of self-location. *Note* Covariates are evaluated at: Attention Allocation = 3.575, Spatial Ability = 3.243

Table 4 Between-subjects effects on post-VR attitude change

	Type III sum of squares	df	Mean square	F	Sig.	Effect size
Corrected model	11.675	5	2.335	8.815	0.000	0.184
Intercept	79.628	1	79.628	300.611	0.000	0.605
Presence: departure	1.190	1	1.190	4.492	0.035	0.022
Presence: self-location	2.079	1	2.079	7.850	0.006	0.039
Device/Stimuli	0.651	1	0.651	2.456	0.119	0.012
Prior visitation	0.009	1	0.009	0.034	0.853	0.000
Device X prior visitation	0.166	1	0.166	0.627	0.429	0.003
Error	51.918	196	265			
Total	2606.222	202				
Corrected total	63.593	201				

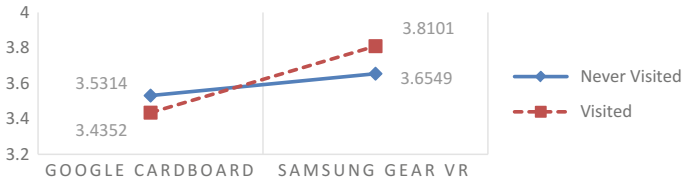

Fig. 3 Estimated marginal means of post-VR attitude change. *Note* Covariates are evaluated at: Departure = 3.063, Self-Location = 3.313

Stimuli and Prior Visitation. It can be observed that among those who have visited the destination, post VR attitude change was more prominent in those using Samsung Gear VR, especially among those who had visited the destinations.

5 Conclusion

The technological drive for VR experiences, characterised by the development of VR platforms and devices for convenient personal use, indicates great potential for widespread consumption of VR tourism content. Destination marketers and managers are faced with challenges in making strategic investment decisions to leverage VR technology to influence consumers' travel decisions. This development also presents research challenges to better understand the effectiveness of VR in shaping consumer attitudes toward tourism destinations. In order to answer these challenges, this study investigates spatial presence in the VR experience involving virtual walkthrough of actual tourism destinations using personal devices (smartphones

and VR viewers). It was found that the sense of being there (i.e., spatial presence) was significantly influenced by attention allocation (*H2* was supported); the more the users allocated attentional resources to the VR environment during the experience, the higher the degree of spatial presence (consistent with Bystrom et al., 1999; Draper et al., 1998; Wirth et al., 2007). This indicates that in order for VR users to achieve higher spatial presence, regardless of their spatial ability, it is imperative to eliminate any distractions that would prevent users from allocating sufficient attention to objects or events in the VR environment. These distractions can originate from the content (e.g., disappearing objects as users move forward), user experience (e.g., hovering buttons in a supposedly natural environment), or the devices used (e.g., seeing the floor during a virtual walkthrough).

Importantly, it was identified that spatial presence contributes positively to attitude change toward destinations (*H3* was supported); a higher sense of spatial presence leads to stronger interest and liking toward the destinations. This confirms the effectiveness of the VR experience for marketing. While there are differences in terms of spatial presence and attitude change across different devices (Samsung Gear VR yielding higher degree of spatial presence and attitude change), the differences are not statistically significant. This indicates that the use of low cost, less sophisticated devices such as Google Cardboard still results in comparable experiences and responses to more sophisticated ones. However, this could also result from statistical representativeness issue due to the small number of Samsung Gear VR users who had visited the destination before.

This study contributes to a better understanding of spatial presence, its determinants, and its consequences on user attitudes in experiences involving depictions of real tourism destinations. This study provides empirical support to literature suggesting the potential role of VR in tourism marketing and management. Importantly, it provides theoretical explanation for the effectiveness of VR in influencing users' response to marketing stimuli, which is helpful for destination marketers justifying investment in VR. However, the results of this study are limited by the characteristics of the participants, a group dominated by young, female consumers. Future research should include a wider range of participants and devices/stimuli to test the generalizability of the findings.

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An Afternoon at the Museum: Through the Lens of Augmented Reality

Larissa Neuburger and Roman Egger

Abstract This paper addresses how Augmented Reality (AR) can be used as a tool to provide a different dimension to the museum experience, by furbishing the actual environment with extra information, which enables users to have a different perception of reality. When integrating both the concepts of AR and Experience, the authors discovered that this could be a powerful tool for museums, which have to grapple with the question of how to engage their visitors and present information in a captivating way. Therefore an AR application prototype was developed. Museum visitors were subsequently invited to participate in an experiment, which had the objective of gauging the value of AR and whether or not it made a significant difference towards the museum experience. On the whole, this paper aims to show how technology can be used in the curation process, by facilitating and enhancing the presentation of exhibits in a museum.

Keywords Augmented reality · Museum experience · Experience economy · Museum · Visitor experience

1 Introduction

The authors of this paper advocate a need to assess the state of affairs in museums critically, as visitor numbers in the Federal Museums in Austria have been on the decline over the past few years (Standard, 2012). Instead of relying on tried and tested approaches, there is a need for museums to reinvent themselves and to use the vast array of possibilities offered by new media, in order to draw in more visitors. The typical museum visitor is discontent, restless and on a quest for stimuli. To put it succinctly, people are not satisfied with ordinary, homogenous

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tourism products anymore but are looking for customized, emotional experiences (Brunner-Sperdin, 2008). No longer willing to be passive consumers, the contemporary tourist has certain aspirations, namely to be at one and to immerse themselves in the tourist experience. They now demand information, entertainment, active participation and multisensory stimulation in combination with innovative design elements (Pine II & Gilmore, 1999). Bearing in mind these findings by previous researchers, the authors of this paper are particularly interested in the concept of experience and how to integrate this with AR, in order to ascertain how the experience of museum visitors can be improved and enhanced. The authors hope that this paper will be able to provide concrete suggestions and valuable insights for museums to re-strategize and embrace the potentialities of AR. This paper seeks to clarify what AR is about, and to present its relevance, benefits and challenges.

The primary thrust behind the research presented here, is the assessment of the museum visitor's experience and how it can be enhanced with an AR application. In this paper, the authors distinctly outline the different permutations of AR and how it can be used in different ways to enhance visitors' experience. The central question is formulated below and the subsequent questions listed afterwards, are also relevant to this paper:

Can Augmented Reality enhance the experience of visitors in museums?

RQ1: Which factors influence the experience of a museum's visitor?
RQ2: In which ways can Augmented Reality enhance the experience of visitors in museums?
RQ3: How can Augmented Reality be implemented in museums from a technical point of view?

2 Theoretical Background

2.1 The Experience Economy

The concept of the Experience Economy derives from the process of tertiarization of the economy and is defined by the enrichment of products or services, through components of experiences. According to Weiermair (2001), a plethora of factors have led to this development: conventional transactions failing to yield healthy profits, modern technologies creating new possibilities for production, a different set of customer expectations, as well as a desire to break away from the perpetual slashing of prices.

A model about staging experiences was developed by Pine and Gilmore in (1999), which take into account all of the circumstances leading to the development of the Experience Economy. Within this model, they propose that the perfect experience straddles the polarities of being active and passive. More precisely, it

involves a balance between absorption and immersion, as well as active and passive participation. The perfect experience also encompasses elements from the four domains of 'entertainment', 'education', 'esthetics' and 'escapism'. 'Entertainment' involves both absorption and passive involvement and can refer to attending a performance, listening to music or leisurely reading books. In contrast to 'entertainment', 'education' requires the active participation of the visitors. The third realm of 'escapism' describes not only the total immersion of the visitors into the experience but also his active participation. This in turn, precipitates 'escapism', where the consumers momentarily forget the banalities of daily life and enter a different realm and imaginative space. In the realm of 'esthetics', the consumers are immersed as well into a different world but does not influence it and leaves the external event untouched. This realm is the most multisensory one of all four domains, as the experience of all five senses plays an important role. The richest experiences are those that encompass all aspects and elements of all dimensions. This spot in the middle can be named as the "sweet spot" and represents the perfect overall experience (Pine II & Gilmore, 1999).

2.2 Museum Experience

Ever since the publication of Falk & Dierking's work 'The Museum Experience' in 1992, there has been a growth of museums around the globe. While the museum industry has attained an impressive degree of professionalization since that time, there is a more urgent need than ever before, for museum curators to turn their attention to the experience of museum visitors. The challenge of museums in the 21st century is to redefine their existence within the tangled web of tangible and intangible objects, digital technologies and social media (Falk & Dierking, 2013). Museums also face very real pressures, as they have to garner sufficient funds from the public, the private sector and governmental organizations, in order to ensure their continuity, and have to find a balance between being an institution for collection and preservation and to be sufficiently attractive as a visitor-oriented place, which provides unique experiences that cannot be replicated (Priddat & van den Berg, 2008). So rather than focusing on the collection and marketing campaigns to increase visitor numbers and to broaden the target audience, the museum has to concentrate on the visitors and the visitor experience (Falk & Dierking, 2013).

The museum experience can be compared with a journey the visitors are travelling through. The visitor experience can also be compared to the customer journey, which is a basic tool for the analysis of visitor experiences in the tourism sector. Falk and Dierking (2002) conceive of the museum experience as an entire narrative trajectory—from the visitor's first thoughts about the museum, moving onto the actual visit all the way up to the final moments, where memories linger on in the mind of the visitors after the museum visit. The museum experience has to be seen within the background context and the individual situation of each visitor. Therefore, the visitors are involved in a personal, social and physical context of

which the certain experience depends on. The personal context refers to the personal background of the visitors, their experiences and the knowledge they brings to the museum as well as their interests, motivations and concerns. This renders the museum experience an intensely personal one, as every visitor arrives with his own background, expectations and experiences. The social context describes the social interaction the visitors have with other visitors or the staff of the museum. The museum experience depends on the company of the visitor and the group, which the visitor is part of, the degree of crowd density and the knowledge as well as the friendliness of the museum staff. The physical context refers to the spatial dimension that confronts the visitors when they enter the museum. In colloquial terms, it is the "feel" of the museum, or more concretely its architecture or ambience. This spatial dimension has a profound and long-lasting impact on the visitors; it influences their behaviour consciously and subconsciously, and can affect the duration of their stay and whether or not it is inviting enough to warrant a second visit. When the visitors feel at ease and enjoy the multisensory stimulation in the space, they would feel that their needs are met and expectations possibly surpassed, and thus would be more likely to stay on for a prolonged period, or to revisit and recommend the museum to others. So it is important for museum professionals to not only focus on one or two of the concepts but to see the museum experience as a holistic construct influenced by the personal, social and physical context (Falk & Dierking, 2002).

2.3 Augmented Reality

AR "[…] describes the concept of augmenting a view of the real world with 2D images or 3D objects […]." (Woods et al., 2004, p. 230). As AR is a fairly new concept in tourism and still in its rudimentary phase of development, a clear and ultimate definition cannot be given yet (Han, Jung, & Gibson, 2013). Smartphones and tablets are now used on an unprecedented scale and this has led to changes not only in communication and human behaviour, which in turn stimulated the development of AR. An important aspect of AR is its ability to "[…] enhance a user's perception of and interaction with the real world." (Azuma, 1997, p. 3). AR works in several ways; the augmented objects can be seen through a visor, which can be head-mounted, where the camera is installed on the head of the user mostly with a see-through-display on smart glasses or hand-held mobile devices like smartphones or tablets. The visor consists of a display screen and a small camera, which captures the real world around the user and sends those pictures to the computer, which tracks the position, the elements and the rotation of the camera. Then the artificial components of the AR application are sent back to the display screen. In this way, the user has the illusion of looking through the augmented content into the real world. The big advantage of virtual objects not being limited to costs or physical limitations makes AR a practical and powerful tool. Virtual objects can be 2D images, 3D

objects, videos (animated 2D images), animated 3D objects and sound (Woods et al., 2004; Mehler-Bicher, Reiss, & Steiger, 2011). With advancements and developments over the recent years, AR can be seen as a flexible and practicable tool with high visual quality to overcome the problems associated with limited space and objects being too valuable such that they can be liabilities, while providing a strong source of support that enhances museum content. Within the museum industry, AR is still in its infantile stage but it is becoming increasingly embraced as a credible, versatile and powerful technological tool among the scientific community and the public (Woods et al., 2004; Noh, Sunar, & Pan, 2009). Another advantage of AR is that it does not exclude museums with limited financial resources, as they too, can make use of an AR system. The AR system is one that does not require the acquisition of expensive hardware systems that have to be acquired and many AR software providers offer systems, which can be implemented and applied by museum professionals without any IT expertise (Wojciechowski et al., 2004). The average visitor would not find AR too alienating, foreign or radical, as he/she would already be accustomed to holding mobile devices for the purpose of photography. Therefore, scanning an AR object with the device is a very natural gesture and can lead to an organic museum experience (Sherman, 2011).

3 Methodology

The primary aim of this paper is to explore the influence of AR on the experience of museum visitors. Based on the results from the existing literature, an empirical research study with an experimental design was conducted in order to corroborate and reiterate what had already been discovered. Therefore the sample had to be split up in two groups—the experimental and the control group—in order to determine if the manipulated independent variable affects the dependent variable. As the setting for this study is a museum, a field experiment was conducted (Bryman, 2012, p. 50). In order to assess the experience of the museum visitors from both sample groups, a quantitative questionnaire had to be completed by the participants in the aftermath of the conducted experiment. The two groups filled out the same questionnaire, in order to gauge the differences between their respective experiences.

For the empirical data analysis of this paper, the concept of measuring the experience is important. Therefore, the authors chose to utilize the experience model conceptualized by Pine and Gilmore (2011). The four realms of the model (‘entertainment’, ‘education’, ‘esthetics’ and ‘escapism’) were operationalized in order to deduce suitable questions for the survey. In order to adequately measure how special the museum experience was for the participants, the concept of the Museum Experience Scale (MES) by Othman, Petrie, and Power, (2013) was also added to the survey. The MES also consists of four dimensions, which are defined by ‘engagement’ with the museums and its exhibitions, ‘knowledge’ and ‘learning’ obtained from the museum exhibition and its artefacts, ‘meaningful experiences’ by

interacting with the artefacts of the museum exhibitions and 'emotional connection' with the exhibits and the exhibition. For the process of the operationalization of the concept, different papers were used that had already applied the concepts in empirical studies, with proven validity of the constructs. Due to these previous studies and the tested validity to measure the different concepts, the authors decided that these two models, the one proposed by Pine and Gilmore (2011) and the concept of MES, were the most appropriate and relevant ones for this paper. In addition, questions were specially adapted in order to cater to the unique nature of the AR experimental design.

For this particular research experiment, an AR prototype was developed which could gauge the degree of enhancement experienced by the museum visitors. In order to create a more enjoyable and meaningful visit for the visitors, the AR application was designed to provide background information on the selected artworks. The development of the AR application prototype was made possible through the support of the Dommuseum in Salzburg, the software company Wikitude and the cooperation with a software engineer in order to enhance the quality of the prototype. The objects that were chosen for use in the AR prototype were on the one hand, the most important objects of the exhibition and on the other hand, contained some additional information in the background that could be shown to the visitors through the AR application. The concept of the shown augmented content was also based on the experience model of Pine and Gilmore (2011). Therefore, the augmented content of the different objects was categorised according to one of the four dimensions of the model. In the 'entertainment' dimension, images combined with narrative elements were presented. The 'education' dimension contained detailed description of parts of a painting that could be activated by interactive buttons. The dimension of 'esthetics' consisted of a picture that showed the interior of a book that was showcased in a sealed glass display in the museum. The remaining museum objects from the dimension 'escapism' were augmented with videos where a male and female narrator provided extra commentaries. The experiment was conducted over nine full-day sessions in the Dommuseum Salzburg. After the random selection of participants in the museum, participants were also randomly assigned to two different groups, the control group and the experimental group. Participants of the control group were asked to visit the four rooms of the museum individually and independently in order to fill out a questionnaire afterwards. An additional clause stated that they were not obliged to focus on something special in the exhibition or to remember specific details. The experimental group was asked to try out a museum app with additional information about several museum objects. After confirmation of their participation, the author explained the process of the experiment to them and handed them a paper guide with the objects, which they could experience with the AR app.

4 Results

The collected data from the written questionnaires was recoded and analysed with SPSS 21. Thereafter, the data was registered manually into the program. Due to illegible writing and partially filled out questionnaires, some cases had to be excluded from the sample. Therefore, the number of questionnaires had to be reduced from n = 185 to n = 176.

4.1 Reliability Analysis

The purpose of the reliability scale was to verify if the measurement instrument (in this case the questionnaire) could represent the several constructs completely and consistently and if the same results would emerge with a repeated experiment. In order to ensure the inner consistency of the constructs, the Cronbach's Alpha test, one of the most popular tools, was also applied in this research. The values of the Cronbach's Alpha reliability test are acceptable in almost all constructs as they meet the required $\propto = 0.7$ and therefore demonstrate a strong internal reliability of the items representing the different constructs. Only the construct of 'entertainment' shows a value of $\propto = 0.56$. When items of this construct are deleted, the value does not show a significant increase. Although the required value for most tests is $\propto = 0.7$, a value of $\propto \geq 0.5$ can be accepted in order to compare two groups, which was also conducted in this research (Mücke, 2010).

4.2 Comparison of Groups

In order to evaluate the different results between the groups, the independent t-test was used. The analysis focused on whether differences exist due to random fluctuations or if the differences are rationally explicable (Bühl, 2014). In order to avoid an analysis of every single item, the items of the different constructs were summed up to a common value for each construct of the model. The independent t-test was now applied to test the different hypotheses that were formulated in order to answer the research questions. In order to test the hypothesis, the author also wants to analyse the results separately. Therefore, the different items of the questionnaire were deliberately tested with a 7-level Likert-Scale. As the middle point was located at M = 3.5 it can be said that values in between $3.5 \leq M \geq 7$ can be evaluated as high. The closer the values were towards the value 7, the more positive were the answers of the museum visitors. In addition to the results of the t-test, the effect size was also indicated. The effect size proves if the detected significance of the conducted test also shows an important and meaningful effect. Therefore the effect

measures the extent of the observed effect with a standardized measure, in order to be able to compare them (Field & Hole, 2003).

H1: AR enhances the overall experience of the museum visitors.

Hypothesis 1 could be accepted because of the significant difference between the value of the experimental group ($M = 5.53$, $SD = 0.86$) and the value of the control group ($M = 4.92$, $SD = 1.00$); $t(176) = 4.36$, $p < 0.001$ and therefore, this accounts for the difference of $\Delta M = 0.61$. With an effect size of $d = 0.66$, it can be said that the significant difference shows an intermediate effect. Therefore, it is evident that the experience of visitors who used the AR application to explore the museum exhibition exceeded in quality, the experience of visitors who visited the exhibition only with an audio guide or without any additional information. In order to deepen the analysis of the overall experience, the different concepts and constructs were also explored. The values of the overall experience can be generally evaluated as relatively high values for the overall experience in the museum.

H1a: AR enhances the 'entertainment' realm of the museum visitors.

The construct of 'entertainment' also shows a significant difference ($\Delta M = 0.89$) between the experimental group ($M = 5.47$, $SD = 0.97$) and the control group ($M = 4.58$, $SD = 1.10$); $t(176) = 5.70$, $p < 0.001$. The construct of entertainment also shows the biggest effect size with $d = 0.86$ and therefore represents a highly significant and important result. Entertainment is one of the biggest aspects when it comes to enhancing the experience of a museum. Museum visitors are often confronted with too much information or obtuse exhibition content, which can be too intimidating for most people. Providing visitors with information and access to the museum exhibitions in an entertaining and playful way also enhances the overall experience. This concept of 'edutainment', which had already been mentioned in this paper, combines education and entertainment in a way where the visitors can have fun while learning and yet are able to retain more content and information long after they depart from the museum. The AR application offers boundless possibilities to enhance the entertainment factor in a museum, as it is interactive and summarizes information in the form of multimedia content. Therefore, the visitors can experience the real exhibition and at the same time, obtain stimulation from videos or pictures, which refer to the real artefacts of the museum.

H1b: AR enhances the 'education' realm of the museum visitors.

The difference ($\Delta M = 0.65$) between the experimental group ($M = 6.06$, $SD = 0.95$) and the control group ($M = 5.41$, $SD = 1.27$), $t(176) = 3.86$, $p < 0.001$ is also significant and shows an intermediate effect size $d = 0.58$. Therefore, this hypothesis can also be accepted. One of the greatest priorities of museums is the educational aspect and having to deal with the transmission of information to the visitors. As already mentioned, the biggest opportunity here is to combine education with entertainment, to transfer knowledge to the visitors interactively through multimedia features. Museums always face the challenge of finding the right balance of designing the exhibition in an aesthetically appealing way but at the same

time, they have to take care not to pay too much attention to form at the expense of substance, as the visitor fundamentally needs to be provided with solid information so as to be able to interpret the exhibition and engage with the artefacts. The usage of AR can provide visitors with additional information to the artefacts that often cannot be envisaged otherwise, as different visual perspectives of artefact (such as the inside of the book in the Dommuseum) show and moreover provide this information interactively and in an entertaining, playful way. Therefore, it can be said that AR can enhance the museum-going experience and educate visitors in a memorable way.

H1c: AR enhances the 'escapism' realm of the museum visitors.

This hypothesis can also be accepted due to the value's significant difference ($\Delta M = 0.62$) between the experimental group ($M = 4.79$, $SD = 1.34$) and the control group ($M = 4.17$, $SD = 1.43$), $t(176) = 2.98$, $p < 0.001$, with an effect size of $d = 0.45$ which is still in the desired values. 'Escapism' describes the situation of the visitors who are so thoroughly immersed in the experience so that they temporarily forget about their everyday life, all his problems and concerns. A museum experience itself is able to lead the visitor into this alternative psychological condition. AR can additionally enhance this aspect by showing the visitor a whole new virtual world without letting him lose the connection to the real museum exhibition. Therefore, the application of AR can immerse the visitor totally into the museum situation, let him forget about time and his everyday life beyond the museum, leaving him with a heightened, impressionable and enhanced experience.

H1d: AR enhances the 'esthetics' realm of the museum visitors.

The difference of the two groups in the realm of 'esthetics' is not significant enough to lead to a rejection of the hypothesis. This insignificant difference can probably be explained through the external influencing factors concerning the location of the museum. Due to its location in a side wing of the Cathedral, the visitors can see and experience the church through the windows of the Dommuseum. In that way, visitors can be influenced by stimuli from the church like the Holy Mass every Sunday or organ concerts which are organised a few times per week. As visitors from the experimental group as well as from the control group are influenced by the described stimuli, there can be no significant difference found between the two groups.

H2: AR enhances the overall museum experience of the museum visitors.

The result shows the significant difference ($\Delta M = 0.60$) between the experimental group ($M = 5.33$, $SD = 0.90$) and the control group ($M = 4.74$, $SD = 0.99$), $t(176) = 4.24$, $p < 0.001$ regarding the overall museum experience. The effect size of $d = 0.66$ shows again an intermediate effect. Therefore, the hypothesis can be accepted and it can be said that the museum experience of those visitors who use the AR application is higher than the museum experience of visitors who visit the museum in a traditional way.

H2a: AR enhances the engagement of the museum visitors.

Within the dimension of 'engagement', a significant difference ($\Delta M = 0.67$) was found between the visitors being part of the experimental group ($M = 5.96$, $SD = 0.97$) and visitors of the control group ($M = 5.29$, $SD = 1.24$); $t(176) = 4.01$, $p < 0.001$. Again the effect size was middle to large $d = 0.60$. Therefore, the engagement of the visitors with the museum and the museum artefacts can be enhanced with the application of AR. Especially because of the additional, visualized information, the visitors feel more engaged with the museum and its exhibition and this information helps them to understand the content and interpret it in the right context.

H2b: AR enhances the knowledge of museum visitors.

When comparing the results of the two scales, it is interesting to see that the values of the items 'education' as part of the experience scale, and 'knowledge' and 'learning' as part of the MES are almost identical. Therefore the hypothesis can be accepted, as there is also a significant difference ($\Delta M = 0.65$) between the experimental group ($M = 6.07$, $SD = 0.94$) and the control group ($M = 5.42$, $SD = 1.11$); $t(176) = 4.20$, $p < 0.001$. The effect size shows a similar intermediate characteristic as the construct of 'engagement', $d = 0.63$. As already mentioned, the transfer of knowledge and information can be enhanced with the application of AR to visualize additional information.

H2c: AR enhances the 'meaningful experience' of the museum visitors.

The realm of 'meaningful experience' as part of the MES also shows a significant difference. Therefore, the hypothesis can be accepted with the significant difference ($\Delta M = 0.60$) between the experimental group ($M = 5.31$, $SD = 1.09$) and the control group ($M = 4.72$, $SD = 1.16$); $t(176) = 3.55$, $p < 0.001$. Again, the construct of 'meaningful experience' shows an intermediate effect $d = 0.54$. So it can be concluded that the experience not only can be enhanced by the application of AR but this can also lead to a meaningful experience. This 'meaningful experience' can be influenced by the balance of the content visualized in AR application and the context AR is used in.

H2d: AR enhances the 'emotional connection' of the museum visitors.

The 'emotional connection' refers to the rapport and affinity that museum visitors build up with the artefacts of an exhibition. It shows a significant difference in the dimension of the emotional connection between the two groups but only on a significant level of $p < 0.05$. Nevertheless the hypothesis can be accepted with the significant difference ($\Delta M = 0.48$) between the experimental group ($M = 4.00$, $SD = 1.60$) and the control group ($M = 3.52$, $SD = 1.31$); $t(176) = 2.19$, $p < 0.05$. The effect size $d = 0.33$ shows the lowest value in all constructs and represents a small effect. The values in general are relatively low and are not much higher than the middle point of the frequently-used Likert Scale of 3.5. This can be explained by the religious content of the exhibition. Religious content in a museum is very

complex for the visitors as well for the museum itself. Therefore, visitors cannot build up an emotional connection with the exhibition especially visitors from other countries that are not familiar with the culture and religion of Austria, and therefore face actual limitations. Therefore, AR can be used to familiarize the visitors with these religious artefacts in a way that facilitates their understanding and appreciation for them.

5 Conclusion and Implications

While AR has already been around for more than 20 years, the development of this technology has yet to reach its limits and no one can really predict where these limitations lie. AR is increasingly finding its way through contemporary life, a phenomenon that is compounded by new technological developments. In contrast to VR that appears to be at the peak of its popularity right now, there is plenty that hints at AR being the new supreme technology of the future, which is why it is even more important to investigate its effects, uses and influences in different areas. Furthermore, the importance of museums is something that will persist, despite decreasing visitor numbers. Museums are formidable institutions that showcase the numerous cultural treasures of this world and the accumulation of centuries worth of historical knowledge.

The 21st century poses some challenges to the relevance of museums and museums have to strive hard to avoid coming across as inaccessible ivory-towers. Potential museum visitors have less leisure time but at the same time, more possibilities than ever before to spend their leisure time, with a wide array of activities at their disposal. People also have higher expectations of what they can derive from their leisure activities and do not only want to spend their time and money without discernment, but to engage in unforgettable experiences as well as escaping from their everyday life routine or problems. The museum experience is a highly complex construct that has to be considered in this context. Today, the materialisation of museum artefacts and the digital world can be bridged, by including high-tech components and invisible technologies in order to meet the expectations of the visitors and enhance their experiences on the one hand, without affecting, disturbing or influencing the specially-designed exhibitions.

Given the results of the conducted experiment in the Dommuseum Salzburg, it can be said that AR definitely has the potential to enhance the experience of museum visitors. The results can answer the overall research question and show that both the overall experience defined by Pine and Gilmore (2011) and the Museum Experience by Othman, Petrie, & Power, (2013) has been unequivocally enhanced by AR. When broken down into the different realms and dimensions of the two tested models, it can be said that the realms of ‘entertainment’, ‘education’ and ‘escapism’ as well as ‘engagement’, ‘knowledge/learning’ and ‘meaningful experience’, all demonstrate higher numerical values, alluding to the success of AR. These results also show an intermediate to large effect size. Only the realms of

'esthetics' being part of the experience model and 'emotional connection' as part of the Museum Experience Scale do not show significant values or suggest only a very low effect size due to the special location of the museum next to the Cathedral of Salzburg and its special religious artefacts with their complex meaning. Once again, the authors would like to reiterate that AR enabled the museum visitors to feel more entertained and engaged, to gain more educational knowledge, while being able to experience escapism and simultaneously have an exceptionally meaningful experience.

The question of how AR can enhance the experience of the visitors can be addressed with the different types of content that were used in the application prototype. The content that can be used to augment the various museum exhibits depends on the available additional information of the different artefacts. The older the artefacts, the harder it is to find suitable multimedia content that can be shown with an AR application. In order to find out which content the visitors preferred, the different types of content were classified by using the experience model of Pine and Gilmore (2011) with its four different realms.

According to visitors from the experimental group who tried out the AR application they strongly had a preference for pictures that either showed different aspects of the artefact (background images, inside insights or detail view) or reference images to explain the background of the artefacts. Additionally the presentation of these detailed views or interactive reference pictures that allowed visitors to press buttons or other interactive elements can increase this effect even more. The videos were not favoured unanimously, as some visitors complained that the videos obscured the actual museum object, served as a disturbance to other viewers because of the sound projection and thus made them quite self-conscious. However, most of them agreed that these videos were useful. According to these observations, it can be deduced that videos ought to be used but with an improved technology like overlay videos with transparent background where only the speaker is seen as a small figure next to the artefact instead of one that dominates the whole object. Additionally, headphones and subtitles can overcome the issue of sound, minimizing disruption to non-AR users in the museum. Obviously limited text should be used, in order to avoid information overload. The appearance of the actual object has to be visible and fully-preserved, as many museum visitors are still on a quest to view the 'real' thing as opposed to something replicated.

From a technical point of view, the usage of iPads showed that tablets are suitable devices for AR due to their appropriate size. Differences can always be observed as they vary accordingly to the version of the device. Different qualities of the camera from the different devices face different challenges. Better cameras can track the target image faster but are more sensitive towards light or mirroring effects and the other way around. Therefore, it is still a challenge to develop a stable application for all possible devices on the market. New technological developments and improvements can improve this situation. The most important technical aspect is the implementation of the AR application for usage on the visitor's own devices. The visitors should have the possibility to download the app for their own devices (iOS as well as Android) for free or to include it in the ticket price with a special

code. In this context, the availability as well as the free usage of a WIFI connection is important. Afterwards, the visitors can explore the exhibition individually at their own pace without disturbing other visitors. The AR experience then also depends on the visitor's device, its computing power and its display resolution. Very small devices have other requirements that differ from tablets with relatively big display screens. In addition, the museum could provide some devices for the visitors but one has to foresee that this creates additional responsibilities for the staff, such as having to deal with deposits and ensuring proper returns. In summary, it can be said that it is relatively easy to implement AR in a museum and one of the undeniable advantages have to do with the fact that AR is a budget-friendly technology. The effect of AR on the experience of the visitors and its yet unforeseen consequences, can be seen as much bigger and priceless for the image of the museum, boosting its attractiveness of the museum and possibly cultivating a deeper sense of the loyalty the visitors, when used in an optimal way.

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Technology Acceptance of Virtual Reality for Travel Planning

Peter Disztinger, Stephan Schlögl and Aleksander Groth

Abstract The appearance of affordable hardware has made Virtual Reality (VR) one of 2015s most discussed electronic consumer devices. Its technological power lies in its intensity and the simulated realism it is able to provide. Although gaming is the main driver behind current developments, other domains may benefit as well. Tourism and destination management in particular can be considered for application. Within this context, this technology would not only allow for a more realistic pre-experience of potential destinations, but also enable tourism providers with novel ways of promoting their services to prospective tourists. In order to estimate the potential of VR in tourism, a survey based on the Technology Acceptance Model, has been conducted. After virtually travelling to a selected destination, participants had to complete a 36-item questionnaire. Results indicate significant effects of *Perceived Immersion*, *Interest*, *Perceived Enjoyment* and *Perceived Usefulness* on the *Intention to Use* VR technology for travel planning.

Keywords Virtual reality · Technology acceptance · Travel planning · Destination management

1 Introduction

Tourism areas around the globe have always been facing similar challenges when promoting their destination—prospective visitors have to be convinced to visit a destination and its attractions from afar. In recent years, however, the role

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technology plays in this process has significantly changed. In particular, the rapid dissemination of the Internet has had a fundamental impact on how travellers plan and book trips (Buhalis & Law, 2008). This effect has further intensified through the growing emergence of Social Media and Web 2.0 applications to the point that people today actively influence the reputation and standing of a destination by publicly posting relevant reviews, videos and photos (Boyd & Ellison, 2007). Yet, even with this rather technology-oriented destination marketing, competition between destinations is high and so marketers continuously search for new, more emotional and immersive ways of promoting their products (Hays, Page, & Buhalis, 2013). Virtual Reality (VR) may be seen as one such technology that has the potential to significantly change the way Destination Management Offices (DMO) advertise their region. Head Mounted Displays (HMD), transport the wearer into an 'artificial world' where he/she is able to interact with and experience digital content at a different level of immersion (Fox, Arena, & Bailenson, 2009). HMDs are designed to isolate the user from outside influences. This enhances the perception of presence in a virtual environment and intensifies the experience. For Facebook founder and CEO Mark Zuckerberg VR is thus "the next major computing and communication platform after phones".[1] This prediction led him to invest two billion US Dollars in Oculus VR, a company known for their high-end virtual reality headset called *Rift*. A different approach is pursued by Google, who released a design for a phone holder which transforms ordinary smartphones into VR headsets called *Google Cardboard*.[2]

Although VR may be considered a potential new marketing channel, its acceptance within the tourism domain is barely explored. So far the literature defines this unorthodox way of sampling a potential product as experimental marketing. That is, rather than looking at a destination through traditional advertising media (e.g. print or electronic catalogues) consumers can actually dive in, i.e. feel and experience, rather than just look at pictures. Consequently, travel agencies are able to address customer needs better and more directly. Given the novelty and immersion of this experience, the effect is particularly strong. In addition, people are unfamiliar to these types of experiences and thus have not built up resistances against marketing stimuli through VR interfaces (Pine & Gilmore, 2011). However, as with all new technologies, VR may only be successful when it is widely accepted. While this type of technology acceptance for VR applications has been researched in the educational and medical sector (e.g. Kothgassner et al., 2012; Bertrand & Bouchard, 2008), studies on VR for travelling or tourism are scarce, mainly focusing on augmented or mixed reality applications (e.g. Haugstvedt & Krogstie, 2012; Lee, Chung, & Jung 2015). Hence this study explores the following research quest: "Which influencing factors constitute the acceptance of VR technologies in the context of travel planning?"

[1]See Zuckerberg (2015).

[2]See Simonite (2015).

2 Related Work

VR generally refers to artificial, digital worlds in which users can interact and navigate. A VR system usually provides a real-time, viewer-centred head-tracking perspective with a large angle of view, interactive controls, and a binocular display (Cruz-Neira, Sandin, & DeFanti, 1993; Steuer, 1992). The users' movements are tracked and their surroundings are digitally rendered and visualized, according to these movements (Fox et al., 2009). The competing term Virtual Environment (VE) has a somewhat similar but more inclusive definition, which encompasses not only visual stimuli but also sound, touch, and smell (Cruz-Neira et al., 1993). The main goal of VR is to create an illusion of being in a believable environment where users interact efficiently in performing specific tasks. Two main factors are necessary to provide a VR experience: (1) physical immersion and (2) psychological presence. Physical immersion refers to the degree to which a user is isolated from reality. Additional stimuli, such as 3D-sound, increase the perceived sensation of immersion (Gutiérrez, Vexo, & Thalmann, 2008). Psychological presence refers to the sensation of being in a VE rather than in the place the user's physical body is actually located (Sanchez-Vives & Slater, 2005). The user gains the sensation of being in the VR and immerses into this new world. His/her attention shifts to the new reality and is therefore encapsulated from external stimuli and effects. In the literature this is often characterized as transportation. Users tend to feel immersed in a VR when they report the sensation of arriving in the artificial world (Schuemie et al., 2001). Presence therefore describes—on a subjective level—the extent to which the user is feeling present in the VE.

2.1 Virtual Reality in Tourism

As mentioned earlier, VR may significantly impact the tourism marketing sector. Sussmann and Vanhegan (2000) particularly refer to the possibility of creating new (virtual) touristic areas incorporated in online-communities to help with the travel planning process and consequently co-create future tourism destinations. VR technology could support future visitors by letting them experience what is not yet there. This sort of crowd testing is, according to the authors, not only cost effective but also helps tailor projects to the needs of tourists (Heldal, 2007). The concept of replacing the act of physical travelling through VR is also mentioned in many studies but there is no evidence of it becoming reality any time soon (Guttentag, 2010).

The potential of VR in tourism lies in its ability to provide additional sensory and visual information to prospective tourists. This characteristic has special significance in the tourism domain as most tourism products are defined as confidence

goods. A touristic service may not be tested in advance; hence customers rely in their booking decision solely on the descriptive information they receive through media or social channels. Within this complex decision process, VR can help by providing richer information. Users can travel to the virtual surrogate destination and perceive/sense a potential visit (Berger et al., 2007). Cheong (1995) studied persons planning to travel to an island and therefore virtually visiting different places that fit their interest; such as the Seychelles, the Virgin Islands, Jamaica, the Maldives, etc. People with access to this type of technology made more informed decisions due to the richness of the available information and also had more realistic expectations of their future journey. This may lead to a more satisfactory vacation for the tourist (Cheong, 1995; Williams & Hobson, 1995) and increase success for the destination (Berger et al., 2007).

There have been applications of VR with the aim to attract tourists for over a decade. These implementations are built upon virtual tours on websites and basically consist of simple panoramic or 360° photographs or videos. They already provide a better and richer information experience than traditional brochures, catalogues, or websites and consequently offer significant advantages for prospective tourists (Cho, Wang, & Fesenmaier, 2002). Many studies advocate the use of such interactive features (Fotakis & Economides, 2008; Wan, Tsaur, Chiu, & Chiou, 2007). Lee and Oh (2007) found that incorporating a virtual tour or panoramic photos offers psychological relief to people suffering from travel anxiety, and Thomas and Care (2005) showed that a virtual tour increases the interest in visiting a museum physically.

In cooperation with Samsung, the Marriot Hotel Group provided a so-called *VRoom Service* in selected hotel rooms. These rooms were equipped with a VR Kit, including a Samsung VR HMD, a Samsung Galaxy Smartphone, and an exclusively tailored application based on Samsung's *Milk* framework. Guests in these rooms had the opportunity to follow the adventures of three world-travellers from the Andres Mountains to a market in Beijing over to an ice-cream shop in Rwanda.[3] The combination of storytelling and VR experience led to a huge success: approx. 500 million social media impressions and over 300 million PR impressions.[4] The Thomas Cook Group already uses VR technology to promote their products in ten selected stores in the U.K., Germany and Belgium through try-before-you-buy tours. Their promotion for New York boosted their revenue by 190 percent.[5]

[3]Marriott Hotels' Samsung Gear VR postcards are little works of art disguised as adverts. Retrieved from http://www.t3.com/news/marriott-hotels-samsung-gear-vr-postcards-are-little-works-of-art-disguised-as-adverts.

[4]See Framestore Studio (2015)

[5]How Oculus and Cardboard Are Going to Rock the Travel Industry. Retrieved from http://www.bloomberg.com/news/articles/2015-06-19/how-oculus-and-cardboard-are-going-to-rock-the-travel-industry.

2.2 Technology Acceptance Model (TAM)

Through understanding *acceptance* as a positive reception of an idea, not only as reactive tolerance but more in the sense of active willingness, it stands as a complex interaction of cognitive and emotional processes, which leads to adoption (or rejection) of an innovation (Königstorfer & Gröppel-Klein, 2008). When measuring user acceptance, the *Technology Acceptance Model* (TAM) by Davis (1986) is one of the most applied models due to its straight forward and context-independent applicability. In its purest form TAM uses the two core constructs *Perceived Usefulness (PU)* and *Perceived Ease of Use (PEOU)* to explain *Behavioural Intention to Use (BI)* as a predecessor of *Actual System Use* or success of an information system. Various meta-analyses by King and He (2006), Lee, Kozar and Larsen (2003) and Legris, Ingham and Collerette (2003) could confirm the robustness, parsimony, and universal applicability of this approach. Also in tourism research, TAM has received considerable attention. Kim, Park and Morrison (2008) used the model to explore the willingness of adopting mobile devices in the trip planning process, and a study by Huang, Backman, Backman and Moore (2013) employed TAM in order to test the applicability of 3D virtual worlds in travel and tourism marketing.

3 Methodology

In order to expand previous work on technology acceptance, this study aims to understand the acceptance of VR technology as a suitable medium for travel planning. Davis' (1986) core constructs used in TAM, i.e. *PEOU* and *PU*, were applied in order to build the core basis of our research model. Davis' *Attitude toward Using* has, however, been omitted as an independent variable, as all participants actually used VR technology before. The study was set up and conducted employing a quantitative research methodology, testing and validating a number of hypotheses (Veal, 1997).

3.1 Proposed Research Design

Starting with Davis' (1986) original TAM core variables, the following two hypotheses act as a base for our research design:

H1: *Perceived Ease of Use (PEOU)* positively influences *Behavioural Intention to use (BI)* VR technology for travel planning.

H2: *Perceived Usefulness (PU)* positively influences *Behavioural Intention to use (BI)* VR technology for travel planning.

Building upon more of the above mentioned previous work, this core model is further modified and extended by adding the following independent variables (Fig. 1): *Perceived Enjoyment (PENJ)*, *Interest (INT)*, *Personal Innovativeness (PI)*, *Accessibility (ACC)*, *Skepticism (SKE)*, *Technology Anxiety (ANX)*, and *Perceived Immersion (PIM)*.

Within the technology acceptance literature, *Perceived Enjoyment (PENJ)* is defined as the extent to which a system or service is perceived to be enjoyable. Much of the early work in this area has been conducted in computer gaming (Davis, Bagozzi, & Warshaw, 1992). In the past decade, however, *PENJ* has gained attention in information systems research, covering a variety of application domains such as computer usage, Internet usage, e-learning, online shopping, and instant messaging services (Ayeh, Au, & Law, 2013). For utilitarian systems, *PENJ* has been found to be the weaker predecessor to user acceptance in comparison to *PEOU* and *PU* (Venkatesh & Davis, 2000). These systems are designed to provide mainly instrumental value to the user. For hedonic systems, on the other hand, the main objective is to encourage prolonged use. Within this context, a strong effect of *PENJ* has been observed (van der Heijden, 2004), confirming that it is important for fun-oriented system to be enjoyable. Thus, following Holsapple and Wu's (2007) categorization of VR being a hedonic rather than a utilitarian technology, the following hypothesis is proposed:

H3: *Perceived Enjoyment (PENJ)* positively influences *Behavioural Intention to Use (BI)* VR technology for travel planning.

General *Interest (INT)* in technology is also said to positively influence the intention to use. This construct has been applied as an extended TAM construct in the studies of Romm-Livermore (2012) as well as Soesanto (2013). Within tourism,

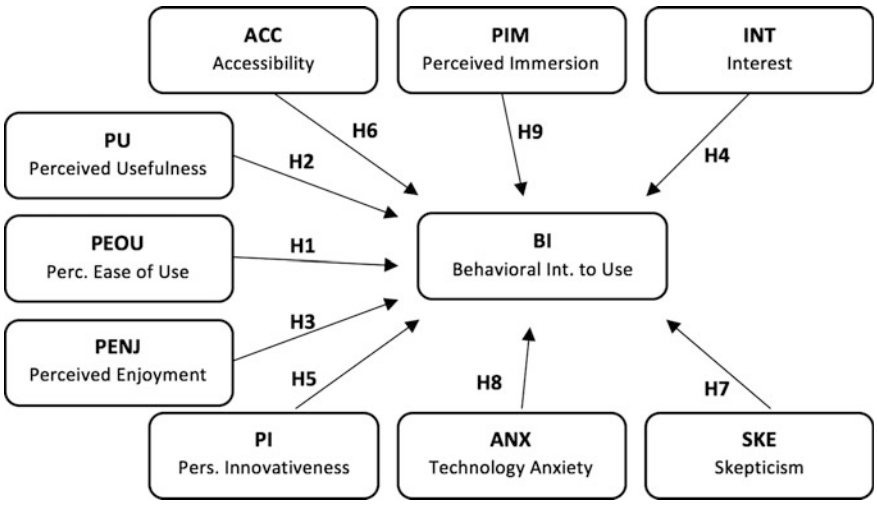

Fig. 1 Proposed research model

Freidl (2006) included *INT* in order to test the acceptance of new technologies in hotel rooms. Therefore the following hypothesis is proposed:

H4: *Interest (INT)* positively influences *Behavioural Intention to Use (BI)* VR technology for travel planning.

Agarwal and Prasad (1998) consider *Personal Innovativeness (PI)* as a user's willingness to try new technologies. *PI* is considered a personal trait derived from Roger's Diffusion of Innovations Theory (2003). A positive effect of *PI* on *BI* in a VR related context has been observed by Yusoff, Zaman and Ahmad (2011). Raaij and Schepers (2008) were able to confirm the same effect for virtual learning environments in China. Hence, the following hypothesis is proposed:

H5: *Personal Innovativeness (PI)* positively influences *Behavioural Intention to Use (BI)* VR technology for travel planning.

Accessibility (ACC) refers to whether a technology is perceived easy to obtain and affordable (Kothgassner et al., 2012). Karahanna and Limayem (2000) distinguish between physical accessibility and information accessibility. The first referring to the extent to which one has physical access to the system, the latter to the ability to retrieve the desired information form the system. Perceived access barriers might negatively influence the adoption of a technology, whereas easy accessibility may support the intention to use. Hence, the following hypothesis is proposed:

H6: *Accessibility (ACC)* positively influences the *Behavioural Intention to Use (BI)* VR technology for travel planning.

Skepticism (SKE) assesses whether a technology is perceived risky, harmful or disadvantageous. Distrust or skepticism is not widely applied in acceptance research. Nevertheless, Kornwachs and Renn (2011) as well as Kothgassner et al. (2012) include SKE in their information system studies. Although, it is more common to use trust as the positive equivalent (e.g. Gefen, Karahanna, & Straub, 2003; Jacques, Garger, Brown, & Deale, 2009; Alsajjan and Dennis, 2010) due to the physical invasiveness of VR it is proposed that:

H7: *Skepticism (SKE)* negatively influences *Behavioural Intention to Use (BI)* VR technology for travel planning.

According to Brown (2002) *Technology Anxiety (ANX)* evokes anxious and emotional reactions when using technology. It is also defined as one's fear of using technology (Simonson, Maurer, Montag-Torardi, & Whitaker, 1987). The construct has been widely used in acceptance studies, (Lee et al., 2003) also leading to its integration to the 3rd iteration of TAM, i.e. TAM3 (Venkatesh & Bala, 2008). Hence, it is proposed that:

H8: *Technology Anxiety (ANX)* negatively influences *Behavioural Intention to Use (BI)* VR technology for travel planning.

Perceived Immersion (PIM) is a characteristic unique to VR and closely related to technology use. It describes the extent to which a computer interface is capable of transporting an inclusive, surrounding and vivid experience. This definition is often criticized as it implies that every user is experiencing immersion the same way and with the same intensity (Schmidt et al., 2013). However, studies by Jennett et al. (2008) and Witmer and Singer (1998) have shown that individuals differ in their perception of immersion, even if they use the same technology. Consequently, *PIM* is defined as an individual's ability to fully engage in a virtual environment. Thus, following Kothgassner et al.'s (2012) argument that the degree of immersion into VR increases acceptance of the technology, it is proposed that:

H9: *Perceived Immersion (PIM)* positively influences *Behavioural Intention to Use (BI)* VR technology for travel planning.

3.2 Study and Questionnaire Design

In order to investigate the above proposed hypotheses, a mobile VR app focusing on travel planning has been utilized. First, a number of different apps were compared and evaluated based on their availability, content richness, trustworthiness, universality, subjective immersion as well as their professionalism. Three potential apps qualified, of which *Google Street View*[6] was selected as the most suitable. Next, a questionnaire survey was designed, which incorporated the relevant question sets to test the above established hypotheses (cf. Table 1).

The Technology Usage Inventory (TUI) (Kothgassner et al., 2012) has been used as a foundation. It was extended with additional (previously validated) items, all of which used a Seven-Point-Likert scale ranging from "fully disagree" to "fully agree". In addition, participants had to provide some demographic information such as age, country of origin and the VR device they used to try *Google Street View*. The survey, together with some instructions on how to install and use the app with various devices (i.e. Google Cardboard, HTC Vive, Oculus Rift), was posted on Reddit in the appropriate VR and subreddits for travelling, on various related Facebook groups, and VR community forums.

Before completing the survey, participants were asked to use *Google Street View* on their device and virtually visit a potential holiday destination. While a number of inspirational targets were given (e.g. Christ the Redeemer statue in Rio de Janeiro, the Maldives, or the Empire State Building in New York City) participants were not limited in their choice of destination nor the amount of time they could spend inside the VR, before eventually completing the survey.

[6]Google Street View: https://www.google.com/streetview/apps/.

Table 1 Questionnaire items and corresponding constructs

Construct	Statement
PEOU	PEOU1: Learning to operate the system was easy for me
	PEOU2: Overall, I find the system easy to use
	PEOU3: I think this technology is complicated to use
PU	PU1: Using this technology would make travel planning more comfortable
	PU2: This technology would help me making the task of travel planning more convenient
	PU3: I find the system useful for travel planning tasks
	PU4: This technology would support me in planning my future travels
BI	BI1: Given that I have access to the system, I intent to buy it
	BI2: Assuming I have access to the system, I intent to use it
	BI3: I would recommend such a system to my friends
PENJ	PENJ1: I find using the system enjoyable
	PENJ2: I have fun using the system
	PENJ3: The actual process of using the system is pleasant
INT	INT1: Throughout my life I have acquired a high level of technical knowledge
	INT2: I inform myself when a new device is launched
	INT3: I always try to stay up-to-date with the latest technology trends
	INT4: I keep myself informed about technological advances
PI	PI1: I'm curious about using computer-based technologies such as VR technology
	PI2: I had already earlier an interest in computer-based technologies such as VR systems
	PI3: I am eager to learn more about computer-based methods, such as VR technology
	PI4: I've always been interested in computer-based technologies such as the VR technology
ACC	ACC1: I think that almost everyone can afford this technology
	ACC2: I think this technology is basically accessible to everyone
	ACC3: I think it is easy to acquire this technology
SKE	SKE1: I think the using this technology is associated with a certain risk
	SKE2: I think that this technology might be dangerous for me
	SKE3: This technology would interfere with my daily routine
	SKE4: Using this technology would bring more disadvantages than advantages for me
ANX	ANX1: I often worry about being overwhelmed by new technology
	ANX2: I am distrustful of new technical devices
	ANX3: I find it hard to trust technical devices
	ANX4: The idea of making a mistake when using a technical device scares me
PIM	PIM1: In the virtual simulation I could for a moment let go of my real world problems
	PIM2: During the virtual simulation, I forgot the world around me
	PIM3: During the virtual simulation, I had the feeling I would truly experience the situation
	PIM4: During the virtual simulation, I felt like being in another world

4 Results

Participants from 29 different countries completed a total of 148 valid questionnaires. The United States accounted for most respondents, followed by Austria, Germany and the UK. Most respondents were male (83.1%) and between 14 and 72 years old; 60% of respondents were less than 30 years of age.

4.1 Reliability, Principle Factors, and Regression

SPSS was used to calculate *Cronbach's alphas* for the proposed constructs. All values were above 0.6, with the lowest reliability found in *SKE* (0.644) and the highest in *INT* (0.939). In order to test if the data reflects the model structure, a *Principle Factor Analysis* was conducted. Results from the Kaiser-Meyer-Olkin (KMO) test measuring sampling adequacy showed a low diffusion in the correlation pattern (KMO value = 0.873). The following primal component analysis identified eight factors that exhibited an *Initial Eigenvalue* > *1*. In combination, these factors were able to explain 71.818% of the total data variance. Using a *Promax* rotation to generate a component matrix, the *SKE* items did not load to any of the identified eight factors and the *PI* and *INT* items did load to the same factor. Consequently, *SKE* items were omitted from further analysis and *PI* and *INT* were merged into one single factor called *INT*. This also led to the rejection of hypotheses H5 and H7 as they were concerned with those now oppressed variable constructs.

Focusing on the exploration of the remaining constructs a linear regression analysis was conducted. First, an ANOVA of the individual constructs aimed at highlighting the relationship between the different components and the dependent variable. Results showed that except for *ANX* all constructs exhibited a direct significant influence on *BI* ($p < 0.05$). Next, in order to evaluate the fit of the model, a multiple linear regression analysis was performed (Fig. 2). The resulting R^2 explains 53.6% of the total variance of *BI* by combining all seven factors. The Adjusted R^2 of 0.512 furthermore highlights a high cross-validity, supporting the overall generalizability of this result (Field, 2013). Looking at the analysis in more detail, *ACC* and *PEOU* show no significant effect on *BI*. Consequently, hypotheses H1, H6 and H8 were rejected. Yet all remaining hypotheses, i.e. H2, H3, H4 and H9 are supported by the data. In particular *INT* ($\beta = 0.378$) *and PENJ* ($\beta = 0.305$) show strong effects on *BI*.

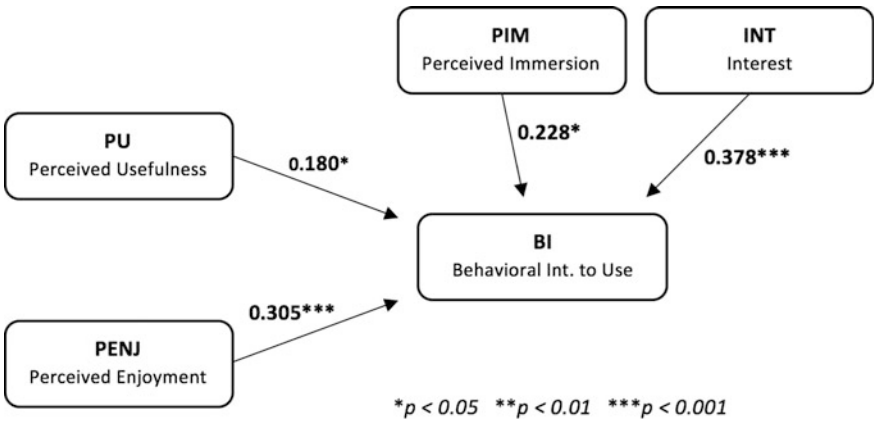

Fig. 2 Final research model with empirical results

5 Concluding Remarks, Limitations and Future Directions

The purpose of Davis' work (1986) was to measure and confirm new predictors for *Perceived Usefulness (PU*) and *Perceived Ease of Use (PEOU).* Even though the initial momentum was to understand and explain the acceptance of IT systems in the work place, his model has been applied in a wide range of fields. For this study, TAM was adapted to VR and travel planning. Our data confirms the relationship between *PU* and *BI.* Evidence for a direct significant effect of *PEOU* on BI was, however, not provided, although *PEOU* was generally high rated (*mean = 6.19*). A reason may be the rather low interaction time participants had with the actual device. Once set up the HMD works hassle-free rendering usability to be less of an issue. *Enjoyment* (i.e. *PENJ*) on the other hand was found to be a good predictor for *BI.* Results support what van der Heijden (2004) and Haugstvedt and Krogstie (2012) have already observed before: intention to use a hedonistic system is heavily influenced by the enjoyment level it produces. Thus, the more fun it is, the higher is one's intention to use it. The strongest predictor of *BI* and subsequently for the postulated acceptance of VR systems was found in the general interest (*INT*) one has in said technology. Here it seems that VR technology is still considered futuristic, for which a certain 'nerdiness' is required in order for it to be accepted. Finally, *Perceived Immersion (PIM)* was found to be a valid predictor for *BI.* Data suggests that the intensity of the immersion also increases the intention to use and consequently the acceptance of the system. In summary, one may argue that VR technology, although significantly improved, is still a (small) step away from mass-market acceptance. Additional improvements regarding its usefulness and enjoyment factor as well as technical upgrades with respect to technology immersion could, however, clear the path to success.

Some limitations of the presented research have to be considered. First, the study has been conducted quantitatively and remotely by participants without supervision. A qualitative setting in an experimental format could share additional valuable insights towards the experience of such technology. Second, only one application (i.e. *Google Street View*) has been used, which was not necessarily produced for marketing destinations but rather for navigation. Third, the majority of respondents owned a personal VR device so that a positive attitude towards VR was already given. A less technology aware response group may have led to a different, less optimistic result.

Future work aims at tackling mentioned limitations. An already planned experimental study setting should generate additional qualitative feedback with respect to the planning experience. Here it is also planned to use and compare different VR applications. Finally, an expansion towards different target groups should highlight potential differences from an end user perspective.

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Part V
Mobile Services and Wearable Technologies

Managing Business Travellers' Use of Mobile Travel Applications

Anneli Douglas, Berendien Lubbe and Adrene van der Merwe

Abstract The purpose of this study is to investigate business travellers' use of mobile travel applications pre-, during and after their business trip by comparing the frequency with which they use an application with the importance that they attach to said application, as well as ascertaining whether differences exist in terms of the demographic profile of business travellers and their use (as it relates to frequency of use and importance attached) of applications in the various travel stages. An internet based survey was distributed to business travellers with the results showing that the frequency with which applications are used does not necessarily reflect their importance, and that demographical differences exist in terms of the use of the applications. The results should enable companies to better understand their employees' requirements of mobile applications and assist them in managing the impact of these applications on the company's travel programme.

Keywords Business travellers · Business travel · Company · Mobile travel applications

1 Introduction

Corporate travel is receiving increased attention from management, as more employees travel for business purposes and travel budgets increase (Sherry, 2015). According to Sherry (2015, p. 118) "Corporate Travel Management (CTM) is responsible for the administration of the enterprises' strategic approach to travel. This includes the travel policy, negotiations with vendors (e.g. corporate rates), day-to-day operation of the corporate travel programme, traveller safety and

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security, credit-card management, and Travel and Expense reporting and data management". Mobile travel applications have become indispensable (Langelund, 2007) in the corporate travel programme, as they supply a wide range of services to support business travellers at any stage of the travel cycle (Morosan, 2014). According to Power (2013) three out of four business travellers possess a smartphone and will typically use two travel applications during the travel experience on behalf of the company (CWT Travel Management Institute, 2014).

Even though a number of studies have been conducted on the use of mobile applications in the context of leisure travel (Morosan, 2014; Posland, 2001; Anuar, Mushaireen, & Khalid, 2014) very little is known about the use of mobile applications by business travellers. Despite the fact that industry publications provide valuable knowledge on topics such as airlines' use of loyalty programme mobile applications to differentiate themselves in the market (Amadeus, 2011), travel managers' attempts to incorporate mobile travel applications into the travel programme (Airplus, 2012), the impact of mobile applications on travel management companies (Boucher, 2013, p.15; CWT Travel Management Institute, 2013) and the readiness of travel suppliers to use mobile travel applications to their advantage (Cowen, 2008), they are often perceived as somewhat biased, since they are conducted by role-players with a vested interest in the business travel industry. From an academic perspective, corporate travel management, in general, has received little attention among social scientists interested in travel and tourism management (Gustafson, 2012), and even less focus has been placed on mobile applications in the business travel environment. One study that has examined this relationship is that of Budd and Vorley (2013) who investigated how the evolution of mobile applications are affecting and will be affecting the airline industry and their relationship with international business travellers. There is thus a need for more objective and scientific research to understand why and how business travellers use mobile applications, even more so when considering that business travellers are in actual fact more ready to use mobile technology than their leisure counterparts (Lubbe & Louw, 2009). In order to manage the company's travel programme effectively, the use of these mobile applications should be managed and understood, since they may affect traveller behaviour, expenditure and travel policy compliance to name a few (CWT Travel Management Institute, 2013; West, McDonough, Magliaro, & Reid, 2011). The overall aim of this research is therefore to investigate business travellers' use of mobile travel applications pre-, during and after their business trip by comparing the frequency with which they use an application with the importance that they attach to said application at each travel stage, as well as ascertaining whether differences exist in terms of the demographic profile of business travellers and their use (as it relates to frequency of use and importance attached) of applications in the various travel stages. It is important for the management of an organisation to understand these demographical differences since it could affect traveller behaviour and in turn have an impact on the travel management programme.

2 Literature Review

2.1 Business Travel and Mobile Applications

Whilst beneficial to a company, business travel does take away valuable time from the business traveller during which he/she could have been productive (Gustafson, 2012b). According to Sherry (2015) the efficiency with which employee travel is undertaken, is crucial to the productivity of the organisation. Mobile technology, specifically mobile applications, allow business travellers to effectively use time that would have otherwise been spent in transit without the capability to complete job related functions, to now keep up with business requirements. The average business traveller carries three mobile devices with him/her during travel, the most common are smartphones with 95% of business travellers owning one, then tablets and laptops (PC Housing, 2012). These items also enables business travellers to make travel related transactions (e.g. to book or amend fights) and/or keep up to date with their trip (e.g. boarding gate changes, flight cancellations) (Mahatanankoon, Wen, & Lim, 2005; Travelport, 2013). Gebauer (2008) states that the ability of mobile technology to keep employees informed when they are away from the office or up to date during office and non-office hours, has given it very high value. Business travellers appreciate being able to react timely to unplanned situations. If the traveller's trip itinerary is fully integrated with the online booking tool or travel management company's systems, it is possible to push real time changes (albeit due to flight delays or per travellers request to change) directly to the travellers' smartphone/tablet. Even with partial integration travellers can do the updates themselves thereby always being up to date with their trip (Campbell, 2013). Goh, Lee, Ang and Lee (2009) stated that it is vital for application creators and other stakeholders to understand the needs of travellers when using mobile applications. They found that travellers would typically need mobile applications for the following purposes:

- *Travel essentials*: Providing information to the traveller relating to various parts of the trip, from fare searches across search engines to exchange rate information, also assisting travellers with the booking process;
- *Sightseeing*: Provide information on the tourist attraction and access to street maps;
- *Electronic services*: Allow for the business/tourist attraction to push information to the user based on his/her preference;
- *Emergency and medical services*: Provide health and safety information to the user on the destination or tourist attraction;
- *Trip planning*: applications have the ability to design travel package according to the travellers' preferences and needs.

The use of mobile applications (as discussed above) by business travellers could differ according to their demographic profile (in terms of age, gender and level of education). Noting that "Generation Y" business travellers will make-up approximately 75% of the work force by 2025, it is important to match their characteristics to

the mobile application offering. Generation Y wants tailor-made services and enabling the user to personalise the application, is important. In addition, using mobile and online tools for travel related transactions comes easy to them and mobile applications should be kept up to date with the latest developments and trends since it would be easy for this generation of traveller to discard one application in favour of a more up to date one. Social media has played a very prominent role in the lives of Generation Y and mobile applications need to allow linkage to popular social media sites (e.g. Facebook) for the traveller to either share or rate the service used (CWT Travel Management Institute, 2013).

Another important factor that could affect the frequency and importance with which applications are used is the gender of the business traveller. ComScore (2012) found that there is a significant difference among male and female users of travel applications, in that females are 14% more likely than men to use a smartphone application. Furthermore, when analysing specific applications for airlines and hotel brands they found that adoption varied among the genders. Even though, to the researchers' knowledge, no studies have confirmed whether there is a difference between the traveller's level of education and their use of mobile applications, one of the objectives of the study is to ascertain if such differences do indeed exist.

2.2 *The Use of Mobile Applications During the Business Travel Life Cycle*

The mobile solution has gone from being "an amenity to a necessity of the travel process" and the functionality that it provides is useful throughout the entire travel lifecycle (Langelund, 2007, p. 284; Wang, Park, & Fesenmaier, 2012). Amadeus (2011) indicates the influence of mobile technology during the travel lifecycle from the traveller's point of view. In the *pre-trip* phase the traveller would use web, smartphones and tablets to plan and book their travel, *at the airport* they would use it to check-in and purchase ancillary services. *On board* the airplane they could use the Wi-Fi technology (such as what Virgin Atlantic offer) to further plan their journey or for entertainment purposes. *At the destination* the traveller would use his smartphone or tablet to connect with friends and family, they could share their experience or further explore their destination with the assistance of the device. *Post trip*, the traveller would use the devices to share his/her experience or to give feedback to suppliers.

This is further complemented by the recent CWT Travel Management Institute (2014) study, where the value of mobile applications for business travellers during the entire travel life cycle has been visually represented (as per Fig. 1) and areas where the traveller specifically find travel applications beneficial have been highlighted. CWT further recognised that there are several activities that need to be conducted during each stage of the business travel lifecycle. For example, in the pre-travel phase the following three activities have been identified: planning, booking and itinerary consolidation. By analysing this figure one can deduct that travellers have the requirement for mobile travel applications to consolidate their

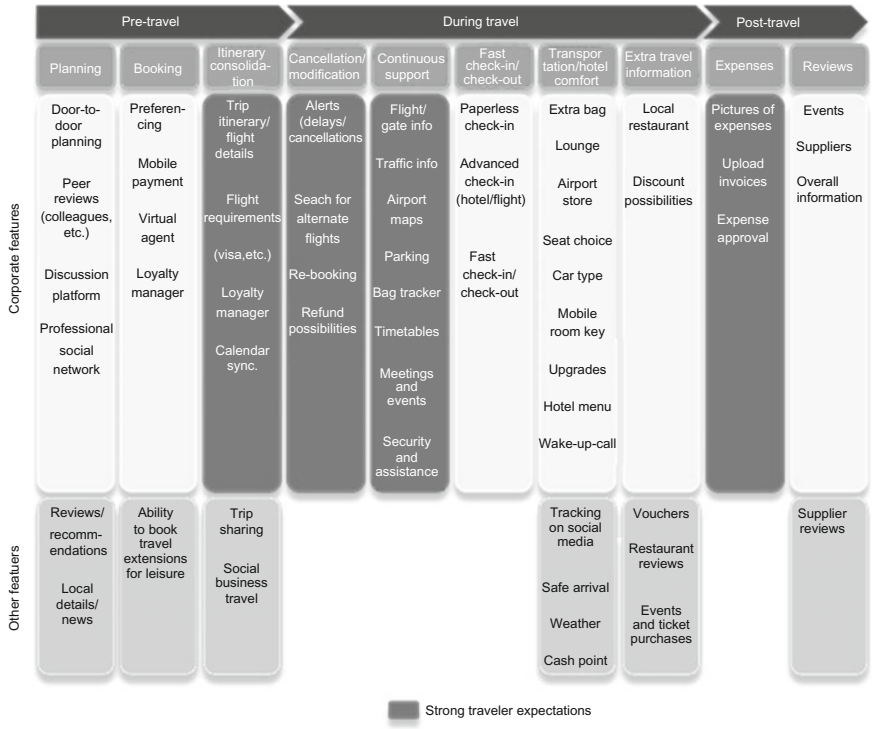

Fig. 1 Examples of possible mobile features at different stages of travel (CWT Travel Management Institute, 2014)

itineraries, provide them with ways to cancel or modify their trip, provide them with continuous support during their trip (such as notification of flight changes) and make it possible to manage the expense process whilst on a trip.

3 Methodology

The overall aim of this research is to investigate business travellers' use of mobile travel applications pre-, during and after their business trip by comparing the frequency with which they use an application with the importance that they attach to said application at each travel stage, as well as ascertaining whether differences exist in terms of the demographic profile of business travellers and their use (as it relates to frequency of use and importance attached) of applications in the various travel stages. The target population for this study is South African business travellers that have travelled domestically or internationally, between 1 August 2013 and July 2014 (12 months), for employment related activities, including, but not limited to meetings, events, conferencing, sales, trading and training to name a few.

The sample is drawn from the database of a large travel management corporation in South Africa with whom the travellers have booked travel during the mentioned period. Non-probability convenience sampling is used to distribute the survey to the South African business travellers on the available data set. The survey consists of different sections including the demographic profile of the traveller, the general use of mobile applications, the frequency with which different activities are conducted on a mobile application and the importance of the said activity. In order to adequately meet the objectives of the study different data analysis techniques are used. The descriptive methods assist in describing the data in terms of gender representations, age groups and education levels while inferential methods allow one to draw certain conclusion about the larger population of business travellers who use mobile applications (Leedy & Ormond, 2013). In this study the Mann-Whitney U-test and Kruskal-Wallis test are utilised to test the differences between the demographic profile of the business traveller (in terms of age, gender and education level) and their use of mobile applications (in terms of frequency of use and importance of application).

The questionnaire was distributed to 13'098 business travellers that have travelled domestically, regionally (within Africa) and internationally, during the period August 2013–July 2014, and booked travel arrangements with a large travel management company. Of the 13'098 emails, 937 were undelivered due to unknown reasons; therefore 12'965 emails were successfully delivered. Two hundred and thirty two (232) responses were received representing a response rate of 1.7%. Every attempt was made to increase this response rate. Even though a percentage of 1.7 is very low the actual number of 232 respondents were considered to be sufficient to conduct the necessary statistical analyses.

Table 1 shows that more males responded to the questionnaire than females. A third of respondents fell in the 39–48 year old category, and the majority of respondents had a post-graduate qualification.

Table 1 Demographic profile of respondents

Demographic profile		Percentage
Gender (n = 221)	Male	68.3
	Female	31.7
Age (n = 219)	Generation Y (19–38 years old)	30.6
	39–48 years old	33.3
	49–58 years old	27.9
	59 years old +	8.2
Level of education (n = 222)	Grade 10 or Equivalent	0.5
	Grade 12 (Matric) or Equivalent	10.8
	Post Matric Certificate/Diploma	25.7
	Graduate	19.8
	Post Graduate	43.2

4 Results

From Table 2 it is evident that mobile travel applications are most important while ***on*** the business trip. Interestingly, respondents deemed mobile applications more important in the booking phase than in the searching phase, which does indicate that mobiles are increasingly being used as a distribution channel, and not merely an information channel.

Table 3 summarises the mobile travel application functions that respondents indicated to be the most important and most frequently used. Respondents were asked to rank the functions according to importance, and the table below shows the number of people that ranked a specific function as the most important. In terms of frequency, respondents were asked to indicate how often they used a function (never/seldom and sometimes/often and very frequently), the percentage of respondents that indicated that they often and very frequently used a specific function appears in the table. Since more than hundred functions were tested, for brevity sake, only the top two most important and top two most frequently used functions in each activity are listed. It is worth noting that in many cases, if a function was indicated to be the top two most important, it also featured in the top two most frequently used list for that activity.

Next, the demographic profile of business travellers was used to ascertain whether differences exist in terms of the frequency with which they use mobile travel application functions and the level of importance that they attach to mobile travel application functions.

Table 4 shows that:

- Female business travellers use the applications more frequently and also attach greater importance to them than their male counterparts.
- Older business travellers use the applications more frequently and also attach a greater importance to them than their younger counterparts.
- Higher qualified business travellers tend to use the travel requirement, air booking and mobile email application functions more frequently than lower qualified business travellers, but at the same time, lower qualified business

Table 2 Importance of mobile travel applications in the travel life cycle

		Very important	Important	Not important	Futile
The importance of mobile travel application during the travel life cycle	Searching (n = 197)	32.5	46.2	18.3	3
	Booking (n = 197)	39.1	45.2	13.2	2.5
	Travelling (n = 199)	40.7	48.2	9	2
	Post Travel (n = 198)	10.6	31.3	49	9.1

Table 3 The most important and most frequently used mobile travel application functions

Activity	Most important functions	Most frequently used functions
Pre-travel		
Planning	1. Travel requirements (e.g. visa, vaccinations etc.) (n = 45)	1. Destination applications (e.g. weather-, exchange rate applications, general destination information) (60%)
	2. Door-to-door planning (Applications supporting address-to-address travel using various modes of transport opposed to point-to-point travel where only hubs (like airports and train stations) are considered) (n = 37)	2. Travel approval (Approval of travel requests by relevant person within the company) (59%)
Pre-travel booking	1. Make air bookings (n = 75)	1. Make air bookings (51%)
	2. Preferencing (The ability to select preferences (e.g. preferred mode of transport or preferred hotel group) (n = 38)	2. Loyalty programme manager (view points/status) (47%)
Itinerary consolidation	1. Flight details (e.g. boarding gate changes) (n = 95; 59%)	
	2. Consolidated itinerary information/Automated itinerary sync (where your travel schedule is synced with your business diary) (n = 76; 41%)	
During travel		
During travel cancellation/modification	1. Make air bookings (n = 67)	1. Alerts on delays/cancellations (37%)
	2. Alerts on delays/cancellations (n = 55)	2. Search for alternative flights (29%)
Continuous support	1. Flight details (e.g. boarding gate changes) (n = 109; 52%)	
	2. Flight status notification (n = 28)	2. Destination applications (e.g. weather-, health-, exchange rate applications) (50%)
Check-in/Check out	1. Advanced check-in (flight/hotel) (n = 114; 60%)	
	2. Fast check-in/check-out (n = 59; 59%)	
Transportation/Hotel comfort	1. Seat choice (n = 106; 69%)	
	2. Lounge access (n = 48; 48%)	
Extra travel information	1. Local restaurants (n = 122; 39%)	
	2. Advice on discount possibilities (n = 35)	2. Restaurant reviews (28%)
Work related supporting applications	1. Mobile e-mail (n = 85; 75%)	
	2. Integrated expense management (where you can submit and/or approve expenses via your mobile phone) (n = 53)	2. Mobile instant messaging (e.g. Whatsapp, Facebook Messenger) (72%)

(continued)

Table 3 (continued)

Activity	Most important functions	Most frequently used functions
Post travel		
Reviews and personal experience	1. Preferencing (The ability to select preferences (e.g. preferred mode of transport or preferred hotel group) (n = 64)	1. Loyalty programme manager (view points/status) (35%)
	2. Loyalty programme manager (view points/status) (n = 43)	2. Preferencing (The ability to select preferences (e.g. preferred mode of transport or preferred hotel group) (28%)
Expenses	1. Picture upload of expenses (n = 76)	1. Expense approval (35%)
	2. Expense approval (n = 76)	2. Upload of invoices (30%)

Table 4 Differences in terms of importance and frequency of use

Function	Z	Kruskal Wallis	Asymp. sig. (2-tailed)
Gender and frequency of use			
Mobile boarding pass	−2.173		0.030
Events notification and ticket purchase	−1.977		0.048
Gender and importance			
Upload of invoices	−2.197		0.028
Age and frequency of use			
Air bookings		8.778	0.032
Alerts on delays and cancellations		7.866	0.049
Age and importance			
Instant messaging		13.124	0.004
Picture upload of expenses		7.960	0.047
Education levels and frequency of use			
Travel requirements		8.300	0.040
Air booking		13.466	0.004
Flight details		11.181	0.011
Advanced check-in		9.591	0.022
Mobile boarding pass		9.404	0.024
Local restaurant		10.765	0.013
Advice on discount possibilities		9.011	0.029
Mobile email		11.444	0.010

travellers use the flight detail, advanced check-in, mobile boarding pass, local restaurant and advice on discount possibilities more frequently than their higher qualified colleagues.

5 Discussion and Conclusion

The main purpose of managing the travel portfolio of an organization is to take ownership of the organisation's traveller behaviour and travel expenditure. To a great extent, control is gained through centralization and standardization (Jenkins, 1993; Lubbe, 2003). Gustafson (2012) mentioned six crucial functions for a professional travel manager one of which is communicating and obtaining support within the organization. It is the travel manager responsibility to provide communication to travellers in terms of the travel policy and important travel-related news, and to obtain feedback (including complaints) about policy rules, travel arrangements, suppliers and travel agency services (Gustafson, 2012). Travel applications provide the ideal platform for the travel manager to communicate with travellers. Despite the continued development and investment in mobile travel applications and the continued academic interest in the use of these applications in a leisure travel context, there is no academic research that examines the functionality and user assessment of mobile travel applications from the viewpoint of the business traveller. The overall aim of this research was therefore to investigate business travellers' use of mobile travel applications pre-, during and after their business trip by comparing the frequency with which they use an application with the importance that they attach to said application at each travel stage, as well as ascertaining whether differences exist in terms of the demographic profile of business travellers and their use (as it relates to frequency of use and importance attached) of applications in the various travel stages. The findings suggest that mobile travel applications are most important while ***on*** the business trip. Interestingly, respondents deemed mobile applications more important in the booking phase than in the searching phase, which does indicate that mobiles are increasingly being used as a distribution channel, and not merely an information channel. This contradicts a previous research study which found that the key features and functions that travellers look for in their smartphones are nearby availability and planning tools with less concern in transactional capabilities (MCDPartners, 2014).

Senn (2000) suggested that there are three ways in which mobile technologies can be applied. These are transaction management (which involves the selection, purchase, and delivery of a product or service), digital content delivery (e.g. real-time weather forecasts, football scores, stock market prices, or flight arrival times), and telemetry or geo-location (using satellite technology to locate individuals and provide navigation services). Our results show that transaction management and digital content delivery were seen as important and were frequently used by business travellers, with telemetry or geo-location not featuring strongly.

SITA (in Budd & Vorley, 2013) identified seven key features of mobile airline applications to be of most value to business travellers. They are: flight search, flight booking, manage booking, mobile check-in, mobile boarding pass, flight status, and a link to the frequent flyer programme. In our research these services also featured strongly as either being part of the top two most important or most frequently used functions. For example, making air bookings was the most important function, and

loyalty programme manager the most frequently used function in the pre-travel booking phase. Mobile check-in was mentioned as being the most important and most frequently used function in the check-in/check out during travel phase.

According to Chen, Murphy, and Knecht (2016) the top ten most important applications for hotel chains are: contact details, booking and reservation functions, directions to the hotel, maps, photos, hotel search, transportation information, check-in/out information, facilities information and hotel overview. Other research studies identified the common presented features and functions on the hotel specific mobile applications to be: room reservations, property searches, realtime feedback via guest surveys, area information, loyalty account access, restaurant and spa reservations and property maps (Adukaite, Reimann, Marchiori, & Cantoni, 2013; eMarketer, 2013; Wang, Xiang, Law, & Ki, 2015). This research study indicated that the ability to make accommodation bookings, to check-in via mobile application and to manage loyalty programmes were regarded as important or were frequently used by business travellers.

Like all research studies, this study is not without limitations. The findings of this study cannot be generalisable to the global population of business travellers who use mobile applications as the sample was non-random and given the low response rate. The findings do nonetheless show some significant trends that could indeed probably be an indication of the needs of the global population. Nevertheless, this study does confirm the needs of business travellers in terms of requirements from mobile travel applications and aid companies in developing their mobile strategy more effectively to meet the needs of their travellers. Companies are becoming more aware of the value of real-time information delivery (Travelport, 2012a) in order to reduce travel stress and increase productivity. Therefore, business travellers should value a travel application that provides them with an infinite amount of information (Travelport, 2012b) that can be customised to their business itineraries (Travelport, 2012a),

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The Future of Wearable Devices On-Site: A Scenario Technique Approach

Fernanda Ortiz Rincon, Eleonora Tommasini, Mattia Rainoldi and Roman Egger

Abstract This study is the first of its kind to apply the scenario technique approach to explore the future of wearable technologies in tourism. Focus groups were conducted to gain an understanding of the core factors that will determine the future use of wearable devices in an on-site tourism context. Software, Hardware, Network & Infrastructure, Comfort & Embodiment, Functions & Usages, Reliability and Third Party Access were identified as the most influential factors. Their future development will determine how tourists will employ wearable devices in their tourism experiences. The proposed future scenarios could serve as guidance for decision-makers in the organisational and destination management context. This research contributes to the theory on technology-mediated experiences in tourism and addresses the gap in literature regarding the tourist experience on-site whilst using wearable technology.

Keywords Wearable devices · Scenario technique · Technology-mediated experience

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1 Introduction

Mobile devices have become a central element in peoples' everyday life. In the tourism industry they also contribute noticeably to the tourist's experience, addressing not only the inspiration and planning stage, but also the experience on-site (Neuhofer, Buhalis, & Ladkin, 2014). Recently, a new form of technology has emerged in tourism: wearable devices. Wearables mediate the tourism experience through their capabilities, by facilitating practical functions such as communication, navigation, information search and health monitoring (Tussyadiah, 2013). Jhajharia, Pal, and Verma (2014) describe wearable as easy to wear devices that become one with clothes and accessories. As objects that interact with the surroundings, they can take various shapes that range from a wristband to a pair of glasses. Choudhary, Bhag, and Walia (2014) argue that while wearable technology will not be replacing smartphones any time soon, its future will be very bright. Wearable devices are considered to be the technology of the future, which will transform the way people experience their surroundings (Prabu, 2012; Dickey, 2013).

Given this rationale and the changing roles that wearables might play in the future of tourism, this paper proposes plausible and possible future scenarios centred around the use of wearable devices on-site. Therefore, this study contributes to the theory on technology-mediated experiences in tourism, which is based on the role covered by technology in facilitating and understanding psychological and behavioural aspects of the tourist's experience (Wang, Park, & Fesenmaier, 2012). To this extent, this study differs from previous ones because it is the first to adopt the scenarios technique as methodology to explore the future of wearable technologies in tourism. Besides outlining possible future scenarios through four narratives, the research explores the factors that are most critical for their future use on-site and how their developments can differently influence the tourist's experience. In addition, the authors hope that this research will represent a meaningful contribution to the existing literature regarding the use of wearable devices in tourism and the tourist experience on-site.

2 Literature Review

2.1 Wearable Devices

The current decade has been witness to the commercialisation of small electronic wearable devices with similar capabilities to those of a smartphone (Benckendorf, Sheldon, & Fesenmaier, 2014), allowing users to access information in real time. Some of these devices include: glasses, watches, bracelets and smart fabrics. Thanks to their wearable nature, they allow for a portable, more convenient, hands-free access to information, in a ubiquitous manner that ultimately will

influence users' experience and behaviour on a deeper, personal level (Tussyadiah, 2015). Despite their growing popularity, wearable technology is still at an 'early adopter' stage in terms of public and commercial use (Wolf, Polonetsky, & Finch, 2015).

Prabu (2012) and Dickey (2013) predicted that smartglasses such as Google Glass would revolutionise tourist behaviour as well as the tourism industry in terms of travel reporting, instant navigation and guiding with augmented reality. Even though the eyewear developed by Google Inc. is currently no longer available to the public, smartglasses continue to be developed by other brands such as Sony and Recon Jet, offering a great array of functions and applications. Moreover, patents have been independently granted to Samsung and Google for Smart Contact Lenses. Smartwatches represent the evolution of the wristwatch, allowing users to access many of the features available on smartphones (Martini, 2014). Although their hardware and battery capacity is still limited, smartwatches present two advantages: they do not require the use of both hands and are constantly connected to the human body (Rawassizadeh, Price, & Petre, 2015). These characteristics potentially allow their application in a multitude of on-site tourism activities.

2.2 Technology and On-Site Experience

The tourism experience has been described by Wang et al. (2012) as an 'activity-based' process. According to Craig-Smith and French (1994), the tourism experience consists of three different moments: a first 'anticipatory' phase, covering planning and reservation processes; a second 'experiential phase', consisting of the on-site experience such as visiting, dining and shopping; and a last 'reflective phase', occurring when the tourist leaves the destination. Although each phase contributes to create value for the tourist and the destination, the literature seems to agree on the relevance of the on-site experience. Not only tourists face more activities and unplanned situations on-site, but also, activities that used to belong to the 'anticipatory' and 'reflective' phases, are nowadays conducted by the tourists directly on-site thanks to the use of mobile technologies (Prebensen, Woo, Chen, & Uysal, 2012). For instance, Wang et al. (2012) highlighted that modern tourists rely on smartphones for the instant search of restaurants and attractions by using location-based apps. Similarly, activities that used to contradistinguish the 'reflective' phase such as sharing of memories with friends and relatives, acquired an instant denotation, with pictures and videos being uploaded and shared on online social networks and platforms in real-time.

Personal technologies are becoming more wearable, implying potential changes in the way users interact with technology and with each other (Tussyadiah, 2013). Relevant for the field of technology and experience is the research of Ihde (1990) about the 'non-neutrality of technology-mediated experiences'. According to Ihde (1990) technologies are set between humans and the world, and therefore they can change human experiences, enhancing some aspects or reducing others. Through

embodiment, technologies will be able to extend the sensory perception of the users, giving them the opportunity to conduct many activities at the same time, such as watching an attraction while accessing different information. Similarly, Wang et al. (2012) stressed the role that smartphones play in mediating behavioural and psychological aspects of the tourism experience. With mobile devices, travellers can easily access, process new information, and experience meaningful interactions with the destination and its attractions (Tussyadiah, 2013; Neuhofer et al., 2014; Wu, Fan, & Mattila, 2015).

3 Methodology

The scenario approach has been addressed by several authors as a trustworthy and effective praxis-based organisational improvement method, employed especially when it comes to determine possible and plausible future developments of particular issues (Shoemaker, 1995; Fink & Schlake, 2000; Moriarty, 2012). The method is particularly valuable because it provides a good support for understanding how to face unexpected events by predicting their potential impacts through conjuring up possible future scenarios. The approach is particularly valuable because it drives the attention on hidden aspects, thanks to the consideration of an issue from different perspectives (Shoemaker, 1995; Page, Yeoman, Connell, & Greenwood 2010). Scenario techniques are widely employed in the tourism sphere, especially when assessing how unforeseen events such as crisis and natural disasters might impact a tourist destination (Song & Li, 2008). The studies conducted by Page et al. (2010) and Malek & Boerboom (2015) represent an example of conjuring up possible scenarios, to better predict and understand the future of a tourism destination. Both studies, not only provide a suitable framework for the scenarios' development in the tourism field, but also highlight the importance of providing the reader with different and extreme future perspectives.

The starting point of the scenario approach is the assessment of those factors that are part of the base scenario, which are combined through creative processes in order to give birth to an array of possible future scenarios (Fink & Schlake, 2000). Important for a first assessment of the approach is the definition of a future horizon that should take into consideration how rapidly changes occur within the selected sphere (Godet, 2006). For this study, a future horizon of five years was adopted based on the position of wearable devices on the *2015 Gartner Hype Cycle for Emerging Technologies* (Riviera & Van der Meulen, 2015), which estimates that wearables will reach the plateau of productivity in 5–10 years.

3.1 Structural Analysis

Structural analysis is one of the most widely used methods when conducting a future study within the frame of the scenario approach. It allows to identify the key and most influential variables and those factors that are critical for the future development of the overall systems (Godet & Meunier, 1999). As the literature suggests, these variables can be identified by resorting to a team process that stimulates creative thinking, open exchange of ideas (Fink & Schlake, 2000) and contribute in reducing the degree of subjectivity (De Jouvenel, 2000). The focus group practice is considered to be one of the most suitable methods for data collection, due to its ability to garner different opinions from the participation of members with diverse values and beliefs (Van der Heijden, Bradfield, Burt, Cairns, & Wright, 2002). Godet and Meunier (1999) highlight the importance of addressing participants that have adequate knowledge of the issue. Therefore in the context of this study, two focus groups were held and recorded on video in October 2015 in Salzburg, Austria. Each focus group lasted around 2 h and saw the participation of ten gender-mixed technology-savvy people. Technology-savvy consumers could be considered as early adopters of technology. The questions raised during both sessions were designed under the framework of the PESTEL Analysis, addressing different aspects concerning the future of wearable devices in order to generate a comprehensive array of factors to form the base scenario (Van der Heijden et al., 2002).

93 factors were identified after coding the recorded discussions. Given that a number of variables too vast could lead to building scenarios that are too complex and not precise (Fink & Schlake, 2000), the identified factors were sorted and clustered through brainstorming techniques, resulting in 21 different variables. These variables are all composed by factors representing different shades of the same concept (Van der Heijden et al., 2002). These were later rated pairwise on a scale from 0 (absence) to 3 (strong influence), to produce an influential matrix that displays which factors should be considered as key factors within the overall system, based on their degree of independency and influence (Schüll & Schröter, 2013). *Software, Hardware, Network & Infrastructure, Comfort & Embodiment, Functions & Usages, Reliability* and *Third Party Access* were identified as the most influential driving forces.

3.2 Morphological Analysis

In the second phase of the scenario building approach a morphological analysis was conducted. It begins by determining the factors' future developments, based on an assessment of internal consistency. The approach is widely used for building scenarios and developing strategic future alternatives. According to Van der Heijden et al. (2002), the future values should be identified according to different polar

outcomes that address the development of the issue in a meaningful way. Accordingly, two different and opposite manifestations for each factor were assessed. In order to identify how well two different developments could complement each other in the future, all developments were rated pairwise by applying a contingency rate on a scale from −3 (complete inconsistency) to +3 (strong mutual support) (Schüll & Schröter, 2013), according to the 5-year future horizon. These data were then processed through the scenario technique dedicated software, *Parmenides EIDOS*, which calculated all the possible combinations and generated multiple scenarios depicting possible future developments.

3.3 Scenarios Selection

Fundamental for the scenario selection is its degree of plausibility and consistency (Van der Heijden et al., 2002). In order to assess a major number of choices, the first one hundred most consistent scenarios were explored. From here, the final four scenarios were chosen based on the most contrasting combinations (Schüll & Schröter, 2013) of the future developments of the most influential driving forces previously identified during the structural analysis.

4 Results

According to the chosen strategy for the selection of future scenarios, the resulting selection displays the best, worst, and surprise-free cases (Schüll & Schröter, 2013). The final four extreme scenarios were named: *Awesome, Meh, Grumpy* and *Evil*. These names were chosen based on recurring words used by participants during the focus groups when describing hypothetical future situations. These four extreme future scenarios depicting the use of wearable devices by tourists at the destination, are described below by means of storytelling. The stories take place 5 years from now, around 2021. All characters are fictional, however, their thoughts and other comments (displayed within quotes in *italics*) are excerpts from comments recorded during the two focus groups.

4.1 Awesome: Traveling Made Perfect

Joao, a 26 year old Brazilian from Rio de Janeiro, arrived last night in Salzburg. Once he decided to come to Salzburg, he immediately bought for himself the latest smartglasses and smartwatch combo deal that had been released on the market. This decision was a '*no-brainer*' as he likes to call it, since both devices were easily affordable and could be paired with his smartphone. Joao knew that wherever he

goes in Europe he would be able to count on reliable network. As soon as he arrived at the airport, he was able to buy a SIM card that provides him with data coverage throughout Europe for a fee even lower than what he is used to pay in Brazil.

In the morning before leaving his hotel room, Joao gears up with his smart-glasses and smartwatch which he loves wearing because "*they are so stylish and just after a few days, he can't even remember they are there*". He is no longer exploring the world through the glasses and his smartwatch, now his wearables are part of him while experiencing and exploring the world. Thanks to the highly sophisticated applications available, he has been able to check-in everywhere (airport, trains, hotel, museums, etc.) with his watch, but not only that. Joao has been navigating the streets of Salzburg effortlessly, paying with his smartwatch wherever NFC payment is available, and recording every step of the way thanks to the reliable functions available on his wearables. Because nearly every tourist crossing his path in the streets is also wearing some sort of wearable device, he does not feel any more or less special, he does not fear for his personal safety and best of all, he is not embarrassed to call his girlfriend and parents back home in Brazil and share some pictures and sounds via Skype as he explores the Mirabell Gardens. When it is time to finally have some food, Joao consults his devices to check for places offering Austrian cuisine with the best reviews near him. He knows he can trust peer reviews, in fact, this is one of the things he loves most about the current times, everybody sharing information and the transparency that comes with it—"*It seems like there's nothing hidden under the sun anymore*"—Joao reflects, remembering how different everything used to be just a decade ago, when the media dominated the flow of information, instead of users equipped with immediate access to technology.

Joao is excited once he finally arrives at Augustiner Bräu, the famous beer garden in the city. The watch tells him that he is walked nearly 5000 steps so far and thanks to his elevated heart rate while walking up the hill, his actual quest for beer and lunch has been registered as a workout, yay! He won't argue about it, instead, he shares his 'morning workout' and *"checks-in with social media to let all his friends know that he's in a cool place and staying fit"*. Now Joao can easily order food and beer via the instant translation features on his devices. He knows "*he could never live without them again*", and knows that his vacation would never be the same without his wearables. They have enhanced his experience beyond what he could have ever imagined. He feels capable of exploring any destination on his own, capable of planning his itinerary wherever he goes, and mainly, his private information is safe with him wherever he goes thanks to the new anti-track technology on his devices, differently as it used to be the case only 5 years ago. Joao takes a sip of his ice-cold beer and his smartwatch warns him that he is about to have a brain freeze. Cheers!

4.2 Meh: Not Much Has Changed

Joao arrived last night from Rio de Janeiro, this is his first time in Europe. Before leaving for Salzburg he bought himself those cool smartglasses and smartwatch he saw on TV—*"they are so affordable, so many choices! It's so hard to decide between so many brands available!"*—Joao thought once he was at the shop. He knew that his new wearables did not differ so much from his smartphone, since they offered nearly the same features—"*nothing too crazy*"—but he just wanted to own the latest tech gadgets available.

This morning Joao gears up with his wearables before leaving the hotel, but soon he notices that except for some teenage tourists, he is the only one wearing all this technology. However, he still feels 'cool' about himself, nobody gives him strange looks because his smartglasses and smartwatch look like everyday objects. Joao goes in search of a SIM card, but soon finds out what a hassle it is to purchase one and roaming costs are expensive too, so he gives up. As the day goes by, Joao discovers that Salzburg is not yet a free Wi-Fi connected smart city and thinks about "*what a disappointment the Network & Infrastructure is in this place!*" He never thought it would be so complicated to get Internet connection outside of his country. Without roaming and without Wi-Fi, Joao cannot find many uses for his wearable devices. Joao visits the Hohensalzburg Fortress, taking some breath-taking pictures and videos with his smartglasses, but unfortunately he will have to wait until he is back in the hotel with Wi-Fi before he can upload and share them on social media. After the fortress, and not being able to use his wearable devices to navigate throughout the city, Joao decides to stay in the busy Getreidegasse and have a shopping day. However, from all the stores he visited, only one enabled him to pay via his smartwatch. One of the store managers explains to him that "*it's not worth for business owners to acquire new technologies that will cater to only a very few*", since the majority of wearables users are very young (teenager) and not spending customers. Now he also understands why he has to use a regular key to access his hotel room, instead of just using a touchless function in one of his devices.

Joao could not manage to navigate to one of the famous Austrian Beer Gardens to go for lunch, so he just walked into a burger joint he stumbled upon. He uses his smartglass to translate the menu, but the funky font style is not easily recognised being offline, so it cannot be translated. Funny enough, this restaurant is full of teenagers and young backpackers, and most of them are wearing a sort of wearable device. They seem to be having fun interacting with their tech gadgets more than Joao did all day. He soon realises that these tech-savvy kids are obsessed with fitness tracking apps, augmented reality games, and above all, "*they just want to look cool with their smartwatches and smartglasses, even if they still have to use their smartphones for the really important stuff*". Joao explores his devices throughout lunch, and concludes that they don't really have any *"killer apps"*, not much more than what is already available on his phone. The sun has gone down and

Joao makes his way back to the hotel. Next morning, Joao chooses to explore more of Salzburg without his wearable devices, he realised that his "*smartphone offers him everything he needs during his trip, everything else is just a luxury!*"

4.3 Grumpy: An Utterly Irritating Situation

The young Brazilian Joao has decided to embark on a new adventure and take his first trip to Europe. His first destination is Salzburg, the posh city of Mozart and the Sound of Music. Posh and classy, that is exactly what he likes! Emerging from a middle class family, Joao likes to take every opportunity to show off what he has accomplished and acquired. Recently he had heard about the latest fad in technology: wearable devices—"*Everyone wants them, only a few will have them*". Joao knew he had to have these gadgets! The 2500 euros he had to pay for the smartglasses plus the 1500 euros for the fancy smartwatch was a large sum even for him, much more than what he would feel comfortable spending, but this was the price to pay to look sophisticated and tech-savvy.

Flying from Rio to Salzburg, Joao gears up with his wearables so he can smoothly go through all airport checks. He is the only one in line at the airport wearing these technologies, which makes him very proud. He will be the only one checking-in with his smartwatch, while all other passengers still use printed boarding passes or smartphones. When his turn in line comes, the airline clerk gives him an annoyed look and tells him that *"these watches are a hassle to properly check-in"*, and soon he discovers she was right. It takes many tries before it actually works and he can go through. He is angry and annoyed, especially after overhearing a lady in line whispering to her friend: *"Doesn't he realise how annoying he is? He is holding the line! And he looks like a fool, a rich fool! Robocop!"* Afterwards, security control gives forces him to put his smartglasses away due to airport security regulations. Joao does not see any signs posted, but he must comply. Once in Salzburg, Joao cannot wait to go out and explore this magnificent city looking chic and smart with his smartglasses. He has such high expectations of his new expensive gadgets, but very soon he notices that—*"there isn't much of a development of software, applications or functions in these little gadgets"* Joao is incurring some hefty roaming charges, because free Wi-Fi is scarce in Salzburg and the network infrastructure of his home-data company lags behind. By now he realises that he has paid a premium price for functions that are already available on his smartphone. But all those looks of admiration he gets from people passing by comfort him—*"Yeah, I'm really cool and sophisticated, they know it!"*

Joao visits the Mozart Geburtshaus and is very happy to enjoy flawless augmented reality thanks to his glasses, he is getting a richer experience compared to other tourists. Unfortunately, after only 20 min he has to remove his smartglasses due to discomfort, they have strained his eyes and now he feels nauseous. He finds

himself very annoyed and a little regretful about all the money spent on these devices. The smartglasses hurt him and when he talks on his smartwatch he must adopt such an awkward posture that it has made him self-conscious to use it in public. He is hungry now and wants to visit the best restaurant Salzburg has to offer, for which he consults his smartglasses, but the information overload is such and so conflicting that he feels he cannot really trust these 'peer-reviews'. *"So many people with so much access to information and irresponsibly giving in their every opinion is not cool anymore! I'm not getting informed, only misinformed!"* So Joao prefers to ask a local for a recommendation and after an early dinner he calls it a day. He is annoyed and tired of his *"fancy but nearly useless devices". "This is not how I imagined my first day in Europe!"* Good night.

4.4 Evil: Technology Takes Over Your Vacation

Joao is a young Brazilian with a true passion for tech and trends. Last week for his 26th birthday he received the latest Sony Smartglasses and a Huawei Smartwatch. His friends told him, that "*wherever he goes in Europe, he will have either network coverage or free Wi-Fi*". He realised his friends were right once he landed in Frankfurt for a layover, and when he finally arrived in Salzburg, he knew they were totally right! *"What a great network everywhere, these really are connected smart cities!"*—Joao told his girlfriend when he video-called her via his smartglasses from the taxi on his way to the hotel.

Joao is happy, his wearable devices equipped with all their amazing functions allow him to do nearly everything he needs to do while on vacation: pay, navigate, plan, book, snap pictures and videos to share with friends on social media, keep an eye on his health condition, etc. While walking down the streets in Salzburg he notices that nearly everybody is wearing smartglasses or smartwatches. *"It's so easy to get addicted to this technology, you can't remember you are wearing it. These devices are amazing! I could never live without them again"*—Joao reflects. This morning, Joao is already exploring the city and quickly checks his Facebook newsfeed while waiting at the traffic light. He cannot believe his eyes when he sees that the latest viral video of the day happens to be his morning misfortune when he tripped in the breakfast room at the hotel, causing great chaos as he fell. He knew he had made a great fool of himself, but he had found comfort in knowing that there were only a very few witnesses to his misery. He remembered that some of these witnesses were wearing smartglasses just like him, he now realised that one of them recorded and instantly uploaded his video on the Internet. Joao wished he could go back to the times where there was still some personal privacy and you could have the peace of mind knowing that this 'awesome' technologies did not jeopardise public safety. *"Everything seems out of control!"* he thought, without yet realising he had been walking in circles since he left the hotel, thanks to blindly following the

navigation system on his watch which had been prompting him for calibration since the moment he turned it on.

After a rough start to the day, Joao decides to listen to peer-reviews on his devices to choose a place nearby to have lunch, but very soon he gives up. *"It is so easy to get overwhelmed with the vast amount of information all over the Internet, nobody controls it and nobody checks for accuracy"*. He now thinks that *"life was much easier with only a few sources of information"*. Overwhelmed, Joao gives control of the rest of his day in Salzburg to his virtual assistant 'Mary'. Mary is now in charge of finding Joao a place to eat, attractions and entertaining activities around the city. By the end of the day when Joao returns to his hotel, he completely regrets spending so much money coming all the way from Rio to Salzburg. He could have done all the things he did today back at home, there is nothing special about this city. He had pizza for lunch like he does every time he goes out with friends. And he still cannot believe how, in such a seemingly beautiful city like Salzburg, there are nearly only massage parlours and betting houses as tourist attractions; these are the places he frequents at home, which he was hoping to take a break from. Joao believes his gambling addiction is a well-kept secret. Unfortunately, he has no idea about all the third parties that have access to his private information and online activities. He does not understand that everything suggested by Mary today was meant to match his interests. Joao thinks he is in control, but he is not. *"His wearable devices have hijacked his vacation"*… Big Brother is watching!

5 Discussion of the Results

Within the framework of the use of wearable devices by tourists on-site, this paper shows that *Software, Hardware, Network & Infrastructure,* and *Comfort & Embodiment*, are the most influential and independent factors that will shape the future of wearable devices. In addition, variables such as *Functions & Usages*, *Reliability* and *Third Party Access* to information, were identified as critical, meaning that they are very influential but also highly dependent on other factors. As argued by Wang et al. (2012), Neuhofer et al. (2014), Wu et al. (2015), Tussyadiah (2015), Tanti and Buhalis (2016), issues such as connectivity, hardware and software implementation, new apps development, data security and the degree of embodiment, play a significant role for the mediated tourist's experience.

The four scenarios aimed to provide an overview of possible future situations concerning the use of wearable devices by tourists at a destination. The first and the last scenarios (*Awesome* and *Evil*) have the highest consistency rate and are therefore the most plausible, based on the ratings assigned in the structural and morphological analysis. Both scenarios are based on the assumption that *Software* and *Hardware* of wearables will undergo further development, becoming more functional, sophisticated, comfortable, and ubiquitous (Tussyadiah, 2015; Wolf

et al., 2015); together with the improvement of *Network & Infrastructure* that provide internet access to those devices. For instance, the European Union has pledged to abolish extra roaming fees by 2017 for all its member countries, enabling its citizens to call, send messages and surf online, at the same rates they pay in their home country (European Commission, 2016). Based on this statement and the current development of these technologies, there is a higher probability that the future use of wearable devices on-site might reflect part of these aspects. The two scenarios are shaped according to quite similar influential future developments. However, the *Third Party Access* to private information plays a big role in their differentiation. While in the *Awesome* scenario, wearables pose no major threat to privacy and protection of private information. On the contrary, the *Evil* scenario presents a possible future where the use of wearables facilitates a permanent intrusive access and acquisition of personal private information by third parties through software and social networks, interfering with the tourist's overall experience on-site. Access to private information is indeed one of the major concerns that affect consumers when considering the purchase of wearable technology (Wolf et al., 2015). Both scenarios portrait a situation where wearables are largely adopted by the population. However, it is only in the *Awesome* scenario where tourists are able to enjoy an enhanced experience.

The scenarios *Meh* and *Grumpy*, on the other hand, present lower consistency rates. This indicates a reduced degree of plausibility and is premised on the assumption that *Software* and *Hardware* of wearables will not undergo major further developments, but rather maintain their current features. Also the future projection addressing network and infrastructures indicates a nearly unchanged situation, without any major further improvements regarding Wi-Fi coverage or the availability of more convenient roaming possibilities. On one side, the *Meh* scenario depicts a largely unchanged situation where the majority of the tourists are still just using their smartphones on-site. Even though they are comfortable to use, the limited possibilities offered by wearables appeal to only a restricted group of tourists, who are either more technology oriented, or more interested in keeping track of their health conditions. The main implication to take away from the *Meh* scenario is that it represents the potential that wearables might have at better mediating the tourism experience, conditional of undergoing further developments in terms of *Software* and *Hardware* and *Network & Infrastructure.*

On the other side, the *Grumpy* scenario portrays a situation, where wearable devices fail to provide tourists an overall experience enhancement, due to its reduced functionality and a high degree of discomfort while wearing them. As argued by Neuhofer et al. (2014), future wearable devices need to offer a distinctive utility in order to provide tourists with an enhanced experience on-site. Eventually, the scenario depicts a situation of tourists' dissatisfaction when using wearables, as they are paying a premium price for *Functions & Usages* already available in other devices. To this extent, price plays a critical role, entailing a strong dependence between the adoption of wearables in travel and the provision of extra value.

6 Conclusion and Limitations

Wearable devices are gaining popularity around the world in both personal and business usage across many fields (Wolf et al., 2015). In the tourism sector, these devices are expected to have an effect on how a tourist would look, communicate and interact with their environment in the future (Tussyadiah, 2013). This study was conducted using the scenario technique, in order to identify future possibilities concerning the uses of wearable devices by tourists on-site. Out of a vast number of possible scenarios generated, the four scenarios chosen and described as *Awesome, Meh, Grumpy* and *Evil*, depict very different plausible future outcomes. This study hopes to bridge the existing gap in literature highlighted by Neuhofer et al. (2014) regarding technology-mediated tourism experience. The portrayed scenarios not only present why and how wearable devices such as smartglasses and smartwatches might be used in the near future by tourists on-site, but also outline how the visitor's experience might be affected. While one scenario presents a situation where embracing technology enhances the tourist's experience, hence maximising customer values and enriching user's skills (Neuhofer et al. 2014; Tussyadiah, 2015), the other scenarios depict alternative situations where wearable devices fail to enable meaningful positive experiences.

From a managerial perspective, this study provides businesses with an example of the use of the scenario technique in the field of technology and tourism. Scenario technique is indeed a valuable approach when planning for future actions. It enables a more meaningful analysis and comprehension of future development, challenging the so-called 'usual way of doing business' (Van der Heijden et al., 2002). Moreover, the findings of this research present a valuable base for decision makers in the tourism industry to undertake actions regarding the use of wearable devices on-site. The limitations of this study present opportunities for further improvements in future research on the topic. Some specific recommendations are: (1) expand the number and composition of the focus groups to include an additional number of key figures of the addressed system (Van der Heijden et al., 2002). For instance, industry professionals and manufacturers of wearable devices should be included in future research projects. This will facilitate: (a) a more robust set of influential factors with their corresponding future developments; and (b) a more critical analysis of the scenarios proposed by the software; (2) analyse the possible use of wearable technology from the supply side of the industry at a tourist destination.

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Copy and Paste for Hotel Mobile Websites? Or: The Power of Screen Sizes

Melanie Fraiss, Sofiya Iliycheva, Mattia Rainoldi and Roman Egger

Abstract The evolution of user experience and the growing popularity of mobile devices have changed the behaviour of today's consumers. The hospitality industry faces several challenges adapting to these changes. By means of Responsive Website Design (RDW), the majority of website content has been tailored to different smart devices. Therefore, the aim of this exploratory study is to find out whether RWD is still considered a state-of-the art technology for hotel mobile websites in guaranteeing customer satisfaction. By means of a true experiment involving an eye-tracking study, think aloud protocols and semi-structured interviews, the findings of this research show that users navigating the same hotel website on different mobile devices exhibit great differences when it comes to usability and content perception. This implies that it is not sufficient to design only one website and adapt it through RWD but that there is a necessity to create variable website designs for variable devices.

Keywords Usability · Content · Responsive website design · Tablet · Smartphone · Eye-tracking

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1 Introduction

Over the last 20 years, mobile devices, namely smartphones and tablets, have affected the development of one of the fastest growing industries in the world (Buhalis & Law, 2008; Egger & Buhalis, 2008; Neuhofer, Buhalis, & Ladkin, 2012). The hospitality industry in turn, has been quick to embrace this and to incorporate various possibilities for mobile device usage (Wang, Park, & Fesenmaier, 2011). Morosan and De Franco (2014) attribute this phenomenon to the ubiquity of mobile devices, their personalisation and familiarity. Given the difference in the screen sizes of the two devices, smartphones having an average display size of 320 pixels by 480 pixels and tablets with an average size of 786 by 1,024 pixels, developing mobile websites for hotels has become more complex than before (Gibbs & Gretzel, 2015).

Nowadays, most websites are tailored to the mobile version through the application of RWD. RWD allows the very one and the same website to re-shape and adapt itself to various screen sizes (Baturay & Birtane, 2013). It serves the enhancement of usability, which is according to Lee and Kozar (2012) of major importance and vital significance for success in online business. According to ISO 9241-11 (1998) usability consists of three major components: effectiveness, efficiency and satisfaction. Effectiveness deals with adequacy of content, ease of use and accuracy and completeness in achieving goals. Efficiency indicates the relation between accuracy and completeness and the resources needed to achieve the latter (Yeung & Law, 2004; Frokjaer, Hertzum, & Hornbaek, 2000). According to Oliver (1999), customer satisfaction is a consumption state after usage of a product or service that indicates whether the purpose of the latter was fulfilled.

The presentation of content is a crucial aspect of all websites. According to Rahimnia and Hassanzadeh (2013), online content constitutes one of the most important tools for companies to expand their businesses and increase profits. In addition, it exhibits a close link to customer satisfaction, which is measured by means of rating scales and indicates how comfortable users feel when using a system and whether they have a positive or negative attitude towards it (Frokjaer et al., 2000). Schmidt et al. (2008) state that it became common in the hospitality industry to make use of the Internet and therefore, websites as a marketing tool. Most industry suppliers are not only visible on online travel agencies, but also operate their own websites (Benckendorff, Sheldon, & Fesenmaier, 2014). Understanding the importance of the website as a powerful tool in hospitality, it should also be taken into account that user experience is different when accessing the website on a different smart device.

However, researchers over the last couple of years have directed their attention more towards the development of mobile applications in the tourism and hospitality industry (Adukaite, Reimman, Marchiori, & Cantoni, 2014; Leung, Lee, Fong, & Law, 2014). Little attention has been given to the importance of hotel mobile websites, especially when it comes to usability and content importance in the context of devices with different screen sizes. Therefore, the aim of this research is

to examine the differences regarding usability and content of hotel mobile websites on mobile devices with different screen sizes.

2 Literature Review

2.1 Mobile Devices in the Search and Booking Process

Over the past decade, mobile technologies have become a popular instrument helping tourists at every stage of their trip (Wang et al., 2011; Neuhofer et al., 2012). In particular, smartphones play an important role in affecting the tourist's accommodation research and booking process (Leung et al., 2014; Linton & Kwortnik, 2015).

Adobe Systems Incorporated (2012) found in their analysis that more than one sixth of the 300 million visits to 31 hotel websites came from smartphones and tablets. Recent research in the area estimated that by 2016, 51.8% of all travel online bookings will be undertaken by means of mobile devices (eMarketer, 2015). Upon closer examination on the demographics of online purchasers and travel bookers, Dhanapal, Deeparechigi, and Thanam (2015) found that the majority of online purchasers comprises Generation Y, born between 1980 and 1994 (Weiler, 2004), followed by Generation X and the baby boomers. The typical profile of a Generation Y user expects that websites have to be easy to navigate (Djamasbia, Siegel, & Tullis, 2010). This overlaps with the findings of Nielsen and Loranger (2006), who have stated that web usability is of major importance nowadays, given how competition has become more intense and unforgiving, with every mistake or delay leading to customer dissatisfaction and lost business.

2.2 Usability and Website Content

As stated above, ISO 9241-11 (ISO, 1998) defines usability as "effectiveness and efficiency and the resulting satisfaction with which certain users reach specified goals in predefined environments". According to Nielsen and Loranger (2006), the most crucial usability problems are associated with the search function, findability-related issues such as navigation, links, category names and information architecture. Other elements like website design, including layout, readability, scrolling and information, as product information, information about the organisation and price, are also of central importance when it comes to the usability of a website (Nielsen & Loranger, 2006).

Another determinant of importance is the content of a website, as it is closely related to customer satisfaction (Rahimnia & Hassanzahdeh, 2013). ISO 9241-151 (ISO, 2008) defines content as a "set of content objects" and content objects as

"interactive or non- interactive object containing information represented by text, image, video, sound or other types of media". Thielsch and Jaron (2012) argued that content is the central element that differentiates websites from other interactive products and that motivates users to visit a website. In this context, Ranganathan and Ganapathy (2002) emphasised that content has a high degree of influence on the purchasing process.

2.3 Responsive Web Design

RWD offers an approach for enhanced website usability and content provision. This method marks a new design paradigm for website architecture that makes the very same website flexibly adaptive to different screen sizes. In contrast to websites without optimisation, which would just adapt themselves to the area that can be viewed, RWD changes the layout of a website based on its viewport. Therefore, its goal is to achieve a more satisfying user experience, regardless of the device used (Bohyun, 2013). However, despite the application of RWD it is of importance for hoteliers not to choose website design and content selection based on one single device but to adapt it across multiple devices. In in other words, it needs to suit the respective screen sizes (Murphy et al., 2016). Mendoza (2014) explains one of the reasons for this, which is due to the mobile mantra, or a simple rule stating that the desktop experience is completely different from the mobile experience and vice versa. When the desktop version of a website is copied to a mobile device, it cannot be adapted so smoothly and thus the experience cannot be replicated.

In line with the arguments that have emerged in the existing literature, this paper will further deal with the following questions: (a) What are the differences in the perceived usability of a hotel mobile website in the context of different screen sizes? (b) How do perceptions of content importance vary in the context of different screen sizes? (c) What are the implications that can be derived from differences occurring on one and the same website in the context of different screen sizes?

3 Methodology

3.1 Research Design

A mixed method approach was adopted for testing usability and content perception on devices with different screen sizes using RWD. Data was collected through an eye-tracking study, which was combined with a think aloud protocol and a semi-structured interview. The website of one of Salzburg's boutique hotels was the test website of this study. Hotel Blaue Gans (http://www.hotel-blaue-gans-salzburg.at/de) was chosen due to the fact that it applies RWD. More precisely, the website

design, navigation and features were identical on both tablet and mobile phone versions, in order to ensure the ability to relate results only to differing screen sizes.

3.2 Sample

In total, 14 persons were included in the study. These were divided into two groups, whereas seven participants tested the chosen website on the iPhone and seven on the iPad. Nielsen and Pernice (2010) argue that five participants are sufficient in a qualitative usability study to identify the major number of issues of a system. All test subjects belonged to Generation Y, which was the only criterion applied, no further demographic distinction was made at that point. The decision for using an iPad Pro and an iPhone 5C was made in order to avoid biases related to different operating systems (IOS and Android).

3.3 Data Collection

The research was conducted in an experimental setting. According to Bryman (2012), the independent variable in an experimental design has to be manipulated in order to find out if a change in the independent variable influences the dependent variable. In this study, the independent variable was the device itself, more precisely the screen size, whereas the dependent variables referred to usability and content perception of the users.

For this study, *SMI Eye Tracking Glasses* were used, a system that allows the researcher to follow eye movements of participants, to determine centres of attention and interest (Duchowski, 2007). At first, a 3-point-calibration was conducted to adjust the device to each individual participant. During that process, the eye-tracker maps the points, recognises the gazes and calibrates (Bojko, 2013). According to Goldberg and Wichansky (2003) the necessity of constant calibration of the hardware poses a big source of failure in the eye tracking methodology. They also critically address differences that may occur due to carrying eye colours and eye kinematics. Following the calibration, participants tested the website on the iPad or on the iPhone and had to fulfil a number of pre-defined tasks, which were identical for both groups.

The participants were asked to: (a) familiarise themselves with the website; (b) look for the best way to get to the hotel; (c) select three leisure activities they would like to do in Salzburg; (d) choose a hotel room that suits them and (e) book the hotel room and stop before registration. Parallel to the eye-tracking, the think aloud method was applied, which is referred to also as “concurrent verbalisation” and describes a method where participants are asked to perform a task and verbalise

whatever comes to their minds while doing that (Jääskeläinen, 2010). For that, the participants were asked to say out loud whatever came to their minds during their task performances. Lastly, in order to gain additional information, a short semi-structured interview was conducted. The interviews were carried out in order to gain supplementary information and were subsequently recorded. The questions of the interview were the following: (1) Where did you first look at? (2) How did you find the complexity of the tasks? (3) How did you find the website layout? Was it readable? (4) How satisfied were you with your task performance? (5) Would you reserve a room in the hotel with the device used? What triggered your answer?

3.4 Data Analysis

The collected data was analysed with the help of the software *SMI BeGaze* in which the recorded videos, eye-movements and the think aloud protocols were combined and displayed. Primarily, data cleansing was applied to identify incomplete or inaccurate data. During this process, data was corrected and one eye-tracking recording had to be excluded from the study due to a calibration error. However, the think aloud protocol and the semi-structured interview of the participant were analysed. According to Bojko (2013), it is not necessary to exclude other data such as the think aloud protocol from the study as it is not affected by calibration. After data cleansing, the areas of interest (AOI) which comprised of website content that was deemed important for the research were determined. These areas were: (1) Logo; (2) Picture block; (3) Language choice; (4) Best available room; (5) Existence reference; (6) English Video; and (7) English Text.

According to Bojko (2013) the analysis of eye-tracking data from dynamic content poses big challenges, since the content moves, changes size, appears or disappears. That is why the collected gaze data had to be manually mapped fixation by fixation on a static reference image. This procedure allowed the software to produce gaze plots and heat maps displaying where the gazes and fixations of the participants were at each point in time during the study. In order to gain a deeper understanding of usability issues, data collected by the means of the think aloud protocol and semi-structured interview was qualitatively analysed. Primarily the recorded data of the think aloud protocol and the interviews were transcribed and reviewed. In line with this process, codes and sub-codes were derived and statements of participants were labelled within those codes and sub-codes.

The qualitative coding was done in *Microsoft Excel* by mapping the codes and sub-codes. The chosen codes represent important elements of usability testing and were used for the development of the semi-structured interview guide (Table 1). The following coding manual was created and applied:

Table 1 Coding manual

Categories	Cognitive process	Usability	Content	Design	Performance
Sub-categories	Asking	Problems	Important content	Layout	Satisfaction
	Guessing	Positives	Less important content	Readability	Outcome
	Complaining	Task complexity	Content problems		
	Statements	Time factor	Unclear content		
			Positive outcome		

4 Findings

Given the fact that hotel website usability and content were the two main focus points, they also represent the main chapters. The content chapter analyses the three reference pictures with including AOIs, the chapter usability deals with usability problems, performance and booking behaviour as well as the layout of the hotel website. One of the measures used for evaluation was dwell time, which represents the sum of durations of fixations and saccades on an AOI (Jacob & Karn, 2003).

Table 2 summarises the outcomes of the eye-tracking study and will further guide the findings chapter on usability and content.

Table 2 Eye-tracking data analysis

AOI	Hits		Dwell time (ms)		Revisits	
	iPhone	iPad	iPhone	iPad	iPhone	iPad
Logo	5/7	5/6	1308.8	827.1	5/7	6/6
Picture block	7/7	6/6	5965.2	4718.5	7/7	6/6
Language choice	7/7	5/6	2812.6	5007.7	–	4/5
Best available room	4/7	0/6	936.5	–	3/4	–
Existence reference	7/7	5/6	818.3	720.9	5/7	5/6
English video	5/7	4/6	5843.5	11837.4	1/5	2/4
English text	7/7	4/6	14166	6637.6	5/7	0/5

4.1 Content

4.1.1 Eye Tracking Analysis

The *English Cover Page* constituted the entrance page of the website. Figures 1 and 2, exhibit the differences in gazing patterns of iPad and iPhone users. The gazes of participants tested on the iPad were more focused on specific areas than the gazes of those tested on the iPhone. The gazes of iPhone test subjects were more interspersed throughout the whole reference picture. Moreover, participants tested on the iPad

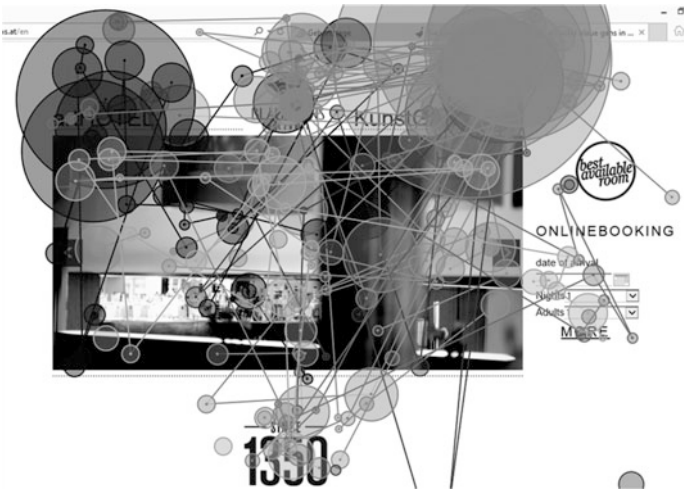

Fig. 1 Gazing pattern iPad users

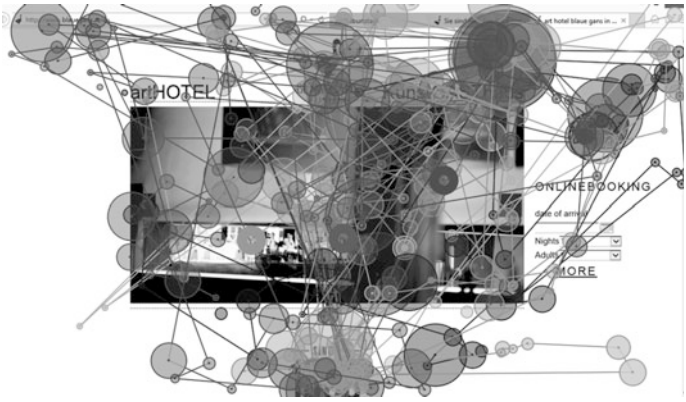

Fig. 2 Gazing pattern iPhone users

seemed to concentrate on certain points more often when looking at the relative size of the fixation marks.

The *Logo* was considered relevant by both user groups and so was the central picture block of the website, as it can be viewed in Table 1. In both groups, the dwell time on the *Picture Block* was considerably high (iPhone 5965.2 ms; iPad 4718.5 ms). The AOI *Existence Reference* has also received large attention among both user groups. The AOI of *Language Choice* accumulated an especially high dwell time among the iPad test group (5007.7 ms).

The *Best Available Room* feature has not been recognised by iPad users at all, while more than half of iPhone users recognised and even re-visited it. The outcomes demonstrate that both groups hit the AOI *English Video*, but only the users on the iPad started watching the video, therefore, leading to a much higher dwell time (iPhone 5843.5 ms; iPad 11837.4 ms). The dwell time of the iPhone test group would have been even lower, if not for the one participant who watched the video extensively. When it comes to the AOI *English Text*, two participants in the iPad test group did not visit the text passage on the cover page as they proceeded to another page of content without scrolling. The findings also show, that iPhone users spent more time reading the text (14166 ms), than users on the iPad (6637.6 ms).

4.1.2 Interview Comments and Observations

In the course of the think aloud protocol, four iPhone participants explicitly indicated the video as less important than content: "*there is a video, I am not going to watch it*", "*I will not look at the video because I don't feel like it*", "*there is a video, maybe I will look at it later*" and "*ok there is a video, but I do not want to watch it*". Among iPad users, only one participant mentioned the video as "boring" after having started watching.

Concerning attention catchment according to the think aloud protocol, the majority of iPhone users were not able to recall which content they looked at first, which is why they mostly mentioned two or even more AOIs. It is also of great significance that two test users on the iPhone stated that they first looked at the overall page and could not define this more clearly. Despite of this, the collected data clearly demonstrate that most users on the phone and the tablet first looked at the picture block.

Related to importance, in the tablet test group, three test users mentioned the video as very important, while, as demonstrated above, the iPhone test users neglected the video. In general, the phone test group mentioned more often that content was considered unimportant. Four people mentioned the video in that context and three people mentioned the redundancy of "*just written information*".

4.2 Usability

4.2.1 Identification of Problems

One of the common problems identified by both user groups was the size of the text passages of the hotel website, which appeared to be too small regardless of the screen size of the tested device: "*I am making the words bigger, the normal size is too small*" (phone) *or* "*the text is too small*" (tablet). The same applies to the *Language Choice*, which was also identified as a main usability problem in both groups. As it can be noticed in Table 1, a substantially high dwell time on this AOI was recorded. The evaluation of the think aloud protocol revealed major problems with this feature.

One user on the iPad experienced major problems in changing the language. This was demonstrated by a dwell time of 16336.7 ms and 27 fixations on the AOI. Another problem identified by users on both devices was the fact that they were redirected to another page during the booking process. Concerning navigation, three participants among the phone test users mentioned that it was very hard to find information on the website, and also stated that they did not find any headlines or pictures to click on.

Five iPhone test users mentioned confusion with "*things being not in their regular places*", "*bad navigation*" and confusion over "*where to click on*". These users made a total of 13 comments along these lines. Among tablet users, three participants mentioned that "*it was strange that the menu was partly on the top and partly at the bottom*" or that "*it was pretty tough to navigate around on the website*". Tablet users made seven comments in total on the subject of navigation. The time factor was considered and mentioned by six users on the phone and four users on the tablet: "*It is going very slowly*" or "*ok let's search—it is loading—pff—it is a little bit slow*".

However, the most significant issue was discovered by the iPhone users when they had to search for leisure activities in Salzburg. The link to the hotel email was placed on top of the activities and the navigation bar could not be clicked. For this reason, iPhone test users were unable to complete the task. Concerning the overall complexity of tasks, all 14 test users said that the tasks were clear. However, six iPhone users mentioned that the tasks were difficult to accomplish with one user clarifying that this might be due to the small screen size of the device. In general, it was found that the total performance among the test users on the tablet took around 8–12 min while the accomplishment of the same tasks lasted for 18–20 min among phone test users.

When it came to complaints during task accomplishment (loading, waiting, not working slow, and having a hard time), tablet test users accounted for nine complaints while phone test users counted for 13 complaints. This was also partly due to the above-mentioned problem with non-responsive navigation. Two participants on the phone even stated that they would "*change to another page if something like that happened*". When analysing the usability and comparing the results of tablet

users and phone users, iPhone users identified a much higher number of usability problems than iPad users.

Layout

The overall website layout was positively appraised by six tablet users while only one tablet user considered it not well arranged. Among the phone users, two people mentioned it as quite likeable and one person considered it at least clean, while all the others made remarks such as "*confusing due to too many headlines*", "*messy*" and "*hard to navigate*", "*not readable*" and "*awful fonts and headlines*".

Performance and Booking Behaviour

All the tablet users mentioned that they were satisfied with their task performance and five said they would reserve a room on the tablet, while two participants clearly stated that they would just not make any reservation due to personal preferences. Among the users tested on the phone, five said that they were basically satisfied with their performance and two stated that they were not at all satisfied. According to that, four participants stated that they would not reserve on the phone at all, while one user revealed that she might consider booking if no computer was available. One test subject said she would reserve only if she was really convinced to book at this hotel, and another mentioned that he would probably make a phone reservation. Finally, one participant mentioned that a phone reservation was likely, but added that there was still some hesitation due to scarce navigability of the website.

5 Discussions and Implications

Researchers have dealt a lot with the development of mobile applications in the hospitality industry throughout the last years (Adukaite et al., 2014; Leung et al., 2014). However, they have largely neglected research on mobile hotel websites. By exploring mobile hotel websites in the context of different screen sizes, this study addresses a major gap in the existing literature. It provides insights on content creation and usability practices on mobile hotel websites by considering user experience. From a practical point of view, the study shows major industry implications in terms of hotel website creation for mobile devices with different screen sizes.

Murphy, Chen, and Cossutta (2016) state that online user behaviour differs depending on what devices are used in the information search and booking process. This study confirms these scientific findings in the context of mobile hotel websites. In the course of the study, many differences in the perception of different contents and usability were examined. The main differences occurred in the perception of

importance of video material, the feature of best available room, the perception of website layout and the amount of usability problems as well as in the intention to finally book via the device used. The study can also affirm the meaningfulness and importance of usability in the contemporary tourism landscape and identify the main usability disablers as navigation, category names, structure of information, product information and price, as proposed by Nielsen and Loranger (2006). This holds true for both devices, tablets and mobile phones, although usability problems occur more severely on mobile phones.

The study aimed at pointing out differences of content importance and usability of devices with different screen sizes. Although it has already been proven that a change in screen sizes impacts perceived usability (Raptis, Tselios, Kjeldskov, & Skov, 2013), this study adds to literature by addressing the perception of content importance and by focussing on hotel mobile websites. The conclusions from this study are that while the hotel website used RWD which ensures a uniform visual appearance on both the iPhone and iPad, some major differences still emerged in terms of content importance and usability. These differences as outlined in the above findings, lead to a number of practical implications for the industry.

The findings first imply that hotel operators, when creating a mobile phone optimised website, need to decide carefully on what should be delivered to the guest via text. They need to place this crucial information on the first page as after some time, the possibility of mobile phone users reading any of the text diminishes. When it comes to the iPad users, the probability of them complaining about having too much text to read, is much less.

Second, the implication following Nielsen and Loranger (2006), is that it is crucial to have a clearly navigable website. This was found to be true on the tablet but even more so on the mobile phone. Especially on website versions for smaller screen sizes, it is of importance to place the navigation bar on the top of the page instead of the bottom, as its location on the bottom potentially creates usability problems.

Third, phone user expectations and desire for quick interaction with the device is much higher than the expectations of the tablet users. It is therefore fundamental to tailor written information according to the different types of devices and the needs of their users. Another interesting point of discussion regards the redirection to external websites. In particular, tablet users felt confused and disliked being forwarded to another website. This was in contrast to the responses of phone users, possibly because of they tendency to rapid browsing between pages. Website developer should therefore present information in a compact and succinct way that ensures maximum usability for the potential customer.

The key implication for the hospitality industry, however, is that it is not sufficient to create one set of website content and overall website design and adapt it to multiple devices by means of RWD. For that, the differences in perception and importance of content, design and usability are too severe among various devices. The final suggestion for the industry would therefore be to separately design websites for different mobile devices in order to ensure customer satisfaction. Given the fact that RWD is referred to as an innovative way of tailoring websites to

different devices (Baturay & Birtane, 2013), the findings of this study constitute an important addition to the existing knowledge in the area.

6 Limitations and Further Research

Although this study has provided some novel insights into how mobile devices' screen sizes influence usability and the user experience, a number of constraints limited the extent and the generalisability of the results. First, data collected through the head-mounted mobile eye-tracking device did not allow for the quantitative evaluation of dynamic content. A table-mounted eye tracking solution would provide the stable and directly comparable set of data required for the analysis of such gaze data.

Second, due to the qualitative nature of the study, the sample size was explorative and only one website was tested. Therefore, it is not possible to generalise the findings to a larger population. A replication of the study could lead to varying and contrasting results, with interesting insights being derived. Another limitation was related to the experimental setting of the study. In the data collection stage both devices were mounted on a stand limiting participants' ability to move the devices naturally.

Future studies in this field should aim to expand the sample size and a larger number of websites should be tested in order to gain a richer body of information. Further studies could also aim at testing outcomes related to differences in usability and content on different mobile devices in a quantitative way to strengthen scientific literature. In that sense it would, for example, be of particular interest to assess if dwell time on areas of interest, varies significantly on different devices.

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Psychological Antecedents of Smartphone Users' Behaviour Along the Mobile Customer Journey

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Abstract This paper analyses the effects of psychological antecedents of smartphone users' behaviour along the mobile customer journey. Relevant psychological characteristics are derived from social cognitive theory, innovation diffusion theory, and empirical studies on mobile user behaviour. Based on a large-scale online survey of 1535 smartphone owners across all age brackets, this study finds that the psychological constructs smartphone self-efficacy, mobile-specific innovativeness, mobile users' information privacy concerns, and personal attachment to smartphone significantly affect smartphone users' behaviour along the mobile customer journey. However, the effect sizes of the individual antecedents vary by travel phase and specific behaviour in question. This has several implications for research and practice alike.

Keywords Smartphone · Mobile customer journey · Mobile booking · Mobile user behaviour · Mobile marketing · Tourism

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1 Introduction

As smartphone penetration reaches the 80% mark in many developed countries (Pew Research Center, 2016) and online behaviour increasingly shifts to mobile devices (e.g. Dischler, 2015), service providers, intermediaries, and other players in the travel, tourism, and hospitality industries need to gain a thorough understanding of what affects the mobile customer journey if they want to remain competitive. When hotels, online travel agencies (OTAs), airlines, etc. design their websites and apps to first attract visitors and users that should then be converted into customers who may even share their experiences or write reviews using their smartphone, they must understand what drives travellers' behaviour along the individual stages of the mobile customer journey. As the number of available apps is growing at a faster pace than their potential user base, the mobile app environment has become increasingly challenging for developers and providers of mobile apps (eMarketer, 2016b). This fuels the need to investigate what drives and inhibits smartphone use in different phases of travel. Indeed, travellers increasingly use their smartphones along all phases of travel, including researching information about travel products and services, making bookings, and sharing experiences (e.g. Wang, Xiang, & Fesenmaier, 2014). In many studies, drivers and inhibitors of such individual-level behaviour typically relate to factors derived from Technology Acceptance Model (Venkatesh & Bala, 2008) or uses and gratifications theory (Katz, Blumler, & Gurevitch, 1973). These motivational factors concern benefits (e.g. utilitarian, hedonic, and social) related to the behaviour. The effects of such factors are highly dependent on the specific behaviour in question, however. They thus lack explanatory power across different behaviours within a certain domain. Thus, this study takes a more holistic approach by drawing upon individual-level *psychological* factors that are independent of specific behaviours, but relevant for a specific domain, namely that of smartphone usage along different stages of the mobile customer journey. Domain-specific individual-level psychological factors are proven predictors of human behaviour in that domain, as it is well documented for domain-specific innovativeness (e.g. Goldsmith & Hofacker, 1991). Previous research has analysed the effect of innovativeness on travellers' on-site smartphone use (Tussyadiah, 2015). However, for a thorough understanding of travellers' behaviour along the mobile customer journey, further relevant domain-specific psychological factors and all phases of travel need to be considered. Against this background, this paper first identifies psychological factors relevant for explaining behaviour along the mobile customer journey and secondly analyses these factors' effects on smartphone users' behaviour in all phases of travel.

2 Literature Review

2.1 Psychological Antecedents of Behaviour Along the Mobile Customer Journey

In order to gain a thorough understanding of smartphone users' behaviour along the mobile customer journey, the present study draws on psychological foundations. We base our understanding on a combination of Social Cognitive Theory (Bandura, 1977) and Innovation Diffusion Theory (Rogers, 1983). Both theoretical foundations have been used in previous research to explain acceptance and diffusion of novel technology such as smartphones and the influence of the respective factors are empirically well established in various contexts. In addition, we draw on recent research on mobile user behaviour.

Social Cognitive Theory. Self-efficacy is a theoretical construct that is derived from Social Cognitive Theory (SCT) (e.g. Bandura, 1977). According to Bandura (1986), 'self-efficacy beliefs' are "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). Thus, individuals who exhibit 'self-efficacy' judge themselves as having the capability of performing a specific behaviour. SCT posits that self-efficacy is core to learning and to general behaviour change. Consumer research has drawn on SCT research focused on self-efficacy for a couple of decades in predicting new technology acceptance (e.g. Compeau & Higgins, 1995; Keith, Babb, Lowry, Furner, & Abdullat, 2015; Venkatesh & Bala, 2008). The construct of self-efficacy has been adapted to the context of the adoption of information technology (IT) in general, (Compeau & Higgins, 1995), and more recently, to the context of mobile computing, (Keith et al., 2015). In both contexts, self-efficacy has contributed to predict the focal behaviour (Davis, Bagozzi, & Warshaw, 1989; Keith et al., 2015; Venkatesh & Bala, 2008). Based on this reasoning, we propose that smartphone-related self-efficacy is a psychological factor positively affecting behaviour along the mobile customer journey.

Innovation Diffusion Theory. According to Roger's (1983) theory of the diffusion of innovations, information about innovations diffuses through social systems and reaches potential adopters. Generally, consumer innovativeness can be defined as "a psychological trait underlying adoption of new ideas, services and products" (Leavitt & Walton, 1975, p. 545). Since global innovativeness lacks predictive power in specific domains (Agarwal & Prasad, 1998; Goldsmith & Hofacker, 1991), domain-specific innovativeness—conceptualized as "the predisposition to learn about and adopt new products in a specific domain of consumer behavior" (Goldsmith & Hofacker, 1991, p. 219)—is considered to significantly affect innovation adoption behaviours within the boundaries of that domain (Agarwal & Prasad, 1998; Goldsmith & Hofacker, 1991). While the overall use of smartphones along the mobile customer journey has increased, specifically making bookings on the smartphone remains a relatively less performed, but innovative activity.

A recent study of American travellers' use of smartphones for a variety of activities on site found that innovativeness in the domains of both tourism and technology positively affects mobile behaviours such as trip management and navigation (Tussyadiah, 2015). Recent studies in the context of mobile marketing found that mobile-specific innovativeness positively affects consumer attitudes related to mobile marketing (Gao, Rohm, Sultan, & Pagani, 2013; Wozniak & Schaffner, 2016). We thus propose that mobile-specific innovativeness is a salient psychological factor positively affecting behaviour along the mobile customer journey.

Mobile User Behaviour. In addition to the abovementioned factors, we consider two further factors that have been proven to affect attitudes and intentions related to mobile user behaviour: information privacy concerns as well as the attachment to the smartphone.

Information privacy refers to the "claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" (Westin, 1967, p. 7). Previous research has established an inverse relationship between privacy concerns and attitudes and usage intentions in various online marketing contexts (Dinev & Hart, 2006a, 2006b; Malhotra, Kim, & Agarwal, 2004; Smith, Dinev, & Xu, 2011) as well as for specific mobile marketing contexts (Gao et al., 2013; Park & Mo Jang, 2014; Wozniak & Schaffner, 2016; Xu & Gupta, 2009). Specifically Dinev & Hart (2006b) found that Internet privacy concerns negatively affect the intention to make transactions online. Therefore, we propose that mobile users' information privacy concerns are a salient psychological factor negatively affecting behaviour along the mobile customer journey.

As smartphones and mobile applications increasingly find their way in consumers' daily lives and affect consumers' day-to-day routines (Reuver, Nikouand, & Bouwman, 2016) and there are "spillover effects from smartphone use in everyday life into travel" (Wang, Xiang, & Fesenmaier, 2016), consumers are likely to develop forms of personal attachment to these devices. According to early research on people's emotional attachment to their mobile phones, the attachment can be attributed to two properties: (a) the iconic meaning for its user by holding the memories and sentiments associated with the text messages, contacts, appointments, and pictures stored on the phone (Vincent, 2006) in combination with (b) the phone's use for supporting the management and maintenance of social relationships in everyday life (Vincent, 2005, 2006). With intensive use of messaging and social media to stay in touch and informed (Pew Research Center, 2015) and frequent taking and sharing of photos while travelling (Gotardi, Senn, Cholakova, Liebrich, & Wozniak, 2015; Wang et al., 2014), today's smartphone owners heavily support this. Recent research has already established the positive relationship between personal attachment to the device and consumer attitudes towards marketing in the mobile context (Gao et al., 2013; Wozniak & Schaffner, 2016). Based on this, we propose that personal attachment to the smartphone is a salient psychological factor positively affecting behaviour along the mobile customer journey.

2.2 Mobile Customer Journey in Travel, Tourism, and Hospitality

The customer journey in travel, tourism, and hospitality can broadly be split into the pre-travel, on-site, and post-travel phases (see e.g. Wang et al., 2014). Planning, expectation-formation, decision-making, and transactions and bookings are activities typically associated to the *pre-travel* phase (Wang et al., 2014). Mobile booking is a crucial element of the mobile customer journey as it marks the conversion from prospects into customers, or from mobile lookers into mobile bookers. Just a few years ago, research has shown that only a fraction of those who research travel products via smartphone actually book via the same device; the vast majority was found to use a traditional desktop/laptop or a tablet computer (Google, 2013). Conversely, this means that those who make bookings via smartphone are most likely to engage in typical pre-travel phase activities prior to making a booking on the same device (e.g. searching for inspiration, researching information, and comparing prices). More recent industry reports hint at a change in mobile booking behaviour, however. For example, in 2016, more than half of Americans who book travel products and services via digital channels are predicted to do so via smartphones and tablets (eMarketer, 2015). Almost 80% of such mobile bookers are predicted to do so via a smartphone (eMarketer, 2015). When comparing different categories of travel products booked via mobile devices, hotels are most likely to be booked via smartphones (81%), followed by flights (53%), and packages (40%) (eMarketer, 2016a).

En route and on site, typical activities are staying in touch with those home (e.g. via messaging or social media), taking and sharing photos, and navigation—just to name a few (Gotardi et al., 2015; Tussyadiah, 2015; Wang et al., 2014). Typical activities of the *post-travel* phase include sharing, documentation, and re-experiencing the trip (Wang et al., 2014).

The increasing use of smartphones along all phases of travel has unlocked the three-stage process of travel: certain activities of the pre- and post-travel phases are now partly performed in the on-site phase, thereby changing the travel experience (Wang et al., 2014). For example, the stay in a destination may not be entirely planned in advance, as the smartphone is a ubiquitous information source encouraging more spontaneous behaviour on site (Wang et al., 2014). Or sharing of experiences is not delayed to the post-travel phase anymore, as photos and videos are taken on the go and shared almost instantly via messaging (e.g. WhatsApp or WeChat) and social media (e.g. Facebook or Instagram) with those at home (e.g. Gotardi et al., 2015; Wang et al., 2014). As a result, sharing of experiences and writing reviews are activities that can nowadays be associated to both the on-site and post-travel phases. A truly mobile customer journey also comprises such activities to be performed via truly mobile devices such as smartphones. In summary, a truly mobile customer journey comprises a multitude of activities performed on mobile devices such as smartphones along all phases of travel.

2.3 Summary of Hypotheses

This section synthesizes the hypotheses based on the literature review in the previous sections. In Sect. 2.1, four individual-level psychological factors were identified as relevant antecedents of behaviour along the mobile customer journey: (1) smartphone self-efficacy, (2) mobile-specific innovativeness, (3) mobile users' information privacy concerns, and (4) personal attachment to smartphone. In addition, the patterns of the relationships (i.e. positive or negative) between these antecedents and behaviour along the mobile customer journey were postulated. In Sect. 2.2, typical behaviours along the mobile customer journey in different phases of travel were identified. As typical pre-travel phase activities, finding inspiration, searching information, and comparing prices are considered. These are typical activities prior to the booking and support processes such as planning, expectation-formation, and decision-making (see also Wang et al., 2014). Mobile booking is a further activity that can be associated to the pre-travel phase, but is treated separately as making transactions distinctively differs from only browsing or searching information. Sharing experiences and writing reviews are considered as typical on-site and post-travel phase activities. In summary, six distinct behaviours along the mobile customer journey are included (see Table 1).

The postulated effects of the four psychological factors on behaviour along the mobile customer journey consisting of six activities result in 24 individual hypotheses. The hypotheses are summarized in Table 1. For example, hypothesis H1a postulates a positive effect of smartphone self-efficacy on the propensity to use the smartphone for finding inspiration. Hypotheses H1x–H4x concern the effects of the psychological factors on typical pre-travel phase activities. Hypotheses H5–H8

Table 1 Summary of hypotheses

	Dependent variables					
Travel phases	Pre-travel				On-site and post-travel	
Independent variables hypothesis	Inspiration	Information	Compare prices	Mobile booking	Share experiences	Write reviews
Smartphone self-efficacy	H1a (+)	H1b (+)	H1c (+)	H5 (+)	H9a (+)	H9b (+)
Mobile-specific innovativeness	H2a (+)	H2b (+)	H2c (+)	H6 (+)	H10a (+)	H10b (+)
Mobile users' information privacy concerns	H3a (−)	H3b (−)	H3c (−)	H7 (−)	H11a (−)	H11b (−)
Personal attachment to smartphone	H4a (+)	H4b (+)	H4c (+)	H8 (+)	H12a (+)	H12b (+)

concern the effects of the psychological factors on mobile booking behaviour. Hypotheses H9x–H12x concern the effects of the psychological factors on typical on-site and post-travel phase activities.

3 Methodology

This study is based on data from an online survey administered in 2016 with smartphone-owning consumers across all age brackets in Switzerland. In 2015, Switzerland had a per-capita GDP of US$ 80,214 (The World Bank, 2016). As of 2016, Smartphone penetration in Switzerland has reached 80%, with iPhones still accounting for the majority of owned devices (Comparis, 2016).

3.1 Survey Development

An online self-administered questionnaire was developed and administered in both German and French to address respondents in the German—and in the French-speaking part of Switzerland. In order to measure the psychological antecedents of smartphone users' behaviour along the mobile customer journey, four multi-item scales reflecting the constructs of smartphone self-efficacy, mobile-specific innovativeness, information privacy concerns, and personal attachment to the smartphone were used. All scales used have been used in previous research to measure the respective constructs and have been adapted to the context of smartphone usage. All items were measured on a 5-point scale (with anchor points 1 = do not agree at all to 5 = fully agree). For details, see Table 2. The questionnaire also included six questions about respondents' behaviour along the mobile customer journey. These behaviours reflect typical activities performed in different phases of travel. They were measured on a 6-point scale for the frequency of how often the respective activity is performed (from 1 = never to 6 = multiple times a day). In addition, the questionnaire asked for respondents' demographic information.

3.2 Sample

Data were collected from a household panel in Switzerland with the help of a market research institute. Potential participants were invited to fill out the questionnaire in return for a small compensation. The sample represents smartphone owners within the Swiss population with regard to age, gender, and country part (German-speaking/French speaking). The final sample size was N = 1535, of which 740 were women (48.2%). Age ranged from 15 to 79 with 27.8% of participants in

Table 2 Reliability and confirmatory factor analyses of psychological factors

Latent and manifest variables	α	M (SD)	Factor loadings CFA
Smartphone self-efficacy (adapted from Keith et al., 2015)	0.79	4.05 (0.86)	
I believe i have the ability… … to make purchases using my smartphone			0.68
… to identify and correct common problems with my smartphone			0.68
… to install and remove mobile applications (e.g. apps) from my smartphone			0.80
… to use standard applications of my smartphone (e.g. calendar, e-mail, task scheduling, etc.)			0.71
Mobile-specific innovativeness (adapted from Agarwal & Prasad, 1998; Gao et al., 2013; Goldsmith & Hofacker, 1991; Tussyadiah, 2015; Xu & Gupta, 2009)	0.81	1.73 (0.86)	
I often recommend new mobile applications (e.g. apps)			0.83
I often forward information about new mobile applications to my friends			0.72
In general, I am among the first in my circle of friends to try out a new mobile applications (e.g. apps)			0.75
Mobile users' information privacy concerns (adapted from and based on Dinev & Hart, 2006a, 2006b; Gao et al., 2013; Malhotra et al., 2004; Park & Mo Jang, 2014; Smith, Milberg, & Burke, 1996; Wang, Duong, & Chen, 2016; Xu & Gupta, 2009)	0.95	4.16 (0.94)	
It bothers me…			
… to give information about myself to companies via my smartphone			0.83
… that companies are collecting too much personal information about me via my smartphone			0.88
… to share information about my current location with companies via my smartphone			0.81
… that companies are collecting too much location information about me via my smartphone			0.86
… that personal information I give to companies via my smartphone could ne misused			0.83
… that personal information I give to companies via my smartphone could be used in a way I did not foresee			0.85
… when I do not have control over personal data I disclose to mobile applications (e.g. apps)			0.82
… when I do not have control or autonomy over decisions about how my personal information is collected, used, and possibly shared by apps			0.85

(continued)

Table 2 (continued)

Latent and manifest variables	α	M (SD)	Factor loadings CFA
Personal attachment to smartphone (adapted from Gao et al., 2013; Vincent, 2005, 2006; Wehmeyer, 2007)	0.71	2.51 (1.01)	
I can't imagine life without a smartphone			0.69
I use my smartphone 24/7			0.54
I am "addicted" to my smartphone			0.81

a younger age group (15–29 years), 30.6% of participants ranging from 30 to 44 years of age, 27.5% ranging from 45 to 59, and 14.1% stemming from the oldest age group (60–79 years). 75.1% of the respondents live in the German-speaking part of Switzerland, while 24.9% of the respondents indicated to live in the French-speaking part.

4 Results

4.1 Measurement of Psychological Factors and Antecedents

Exploratory factor analysis (EFA) with VARIMAX rotation led to a simple structure with four distinct factors (Netemeyer, Bearden, & Sharma, 2003). EFA and reliability analyses were conducted using SPSS 23. Confirmatory factor analysis (CFA) was conducted using AMOS 22. Table 2 displays the results of reliability analyses and CFA. Fit indices were Chi-square = 730.014, degrees of freedom = 129; CFI = 0.962; GFI = 0.948; AGFI = 0.932; TLI = 0.962; and RMSEA = 0.055.

4.2 Hypothesis Testing

In order to test all hypotheses, six multiple linear regressions were calculated to predict smartphone users' behaviour along the mobile customer journey based on the four identified psychological factors, namely smartphone self-efficacy, mobile-specific innovativeness, mobile users' information privacy concerns, and personal attachment to smartphone. Six significant regression equations were found, with an R^2 ranging from 0.117 to 0.249 (see Table 3). Significant effects ($p < 0.05$ for all and $p < 0.001$ for most hypotheses) were found for all postulated relationships, generally supporting all hypotheses. Smartphone self-efficacy was found to positively affect behaviour along the mobile customer journey (H1x, H5, H9x). Mobile-specific innovativeness was found to positively affect behaviour along the mobile customer journey (H2x, H6, H10x). Mobile users' information

Table 3 Results of multiple linear regression analyses

	Dependent variables					
Travel phases	Pre-travel				On-site and post-travel	
Regression models	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Independent variables standardized β coefficients (p-value)	Inspiration	Information	Compare prices	Mobile booking	Share experiences	Write reviews
Constant	0.49	0.33	0.36	0.91	1.06	1.11
Smartphone self-efficacy	0.19 (0.000)	0.26 (0.000)	0.23 (0.000)	0.09 (0.000)	0.05 (0.035)	0.07 (0.004)
Mobile-specific innovativeness	0.21 (0.000)	0.20 (0.000)	0.24 (0.000)	0.26 (0.000)	0.32 (0.000)	0.29 (0.000)
Mobile users' information privacy concerns	−0.05 (0.034)	−0.06 (0.011)	−0.06 (0.009)	−0.08 (0.001)	−0.12 (0.000)	−0.14 (0.000)
Personal attachment to smartphone	0.21 (0.000)	0.23 (0.000)	0.14 (0.000)	0.07 (0.009)	0.06 (0.037)	0.09 (0.001)
R^2	0.198	0.249	0.206	0.117	0.154	0.158

privacy concerns were found to negatively affect behaviour along the mobile customer journey (H3x, H7, H11x). Personal attachment to the smartphone was found to positively affect behaviour along the mobile customer journey (H4x, H8, H12x).

However, the magnitudes of the standardized β coefficients show that the effects of the psychological factors vary by travel phase and specific behaviour in question:

- Smartphone self-efficacy had stronger effects in the pre-travel phase, excluding mobile booking.
- Mobile-specific innovativeness had similar effects across all travel phases, with slight increase towards the on-site and post-travel phase.
- Mobile users' information privacy concerns seem to be more relevant in the on-site and post-travel phases.
- Personal attachment to the smartphone had stronger effects in the pre-travel phase, excluding mobile booking.

5 Conclusions

This paper has set out to deepen the understanding of smartphone users' behaviour along the mobile customer journey by taking a psychological perspective. Confirming our hypotheses, four salient psychological factors were identified and

proven to affect all stages of the mobile customer journey. Smartphone self-efficacy, mobile-specific innovativeness, and personal attachment to smartphone were found to positively influence behaviour along the mobile customer journey; mobile users' information privacy concerns were found to negatively affect behaviour along the mobile customer journey. Further analysis of the magnitude of the psychological antecedents' effects across different stages of the mobile customer journey and individual activities typically performed in these stages yielded interesting results.

Mobile-specific innovativeness proves to take the strongest influence on behaviour along the mobile customer journey. This psychological antecedent seems to have a relatively consistent effect across all activities. Thus, the more innovative the target group the more likely they are to perform typical pre-travel phase activities on their smartphone, to book mobile, to share experiences, and to write reviews using their smartphone. This is consistent with findings by Tussyadiah (2015) who identified a positive effect of technology innovativeness on on-site smartphone use and with studies in the area of general mobile marketing (Gao et al., 2013; Wozniak & Schaffner, 2016) that found an influence of innovativeness on attitudes and intentions. This study adds to past research by extending findings to different stages of the mobile customer journey.

Likewise, smartphone self-efficacy and personal attachment to the smartphone positively affect smartphone usage along the customer journey. This is in line with past research that confirmed the influence of these factors (e.g. Keith et al., 2015 for self-efficacy; Gao et al., 2013 for attachment). Our research adds to existing knowledge by confirming their influence along the customer journey. Additionally, it uncovers that their influence varies along the different stages: Both factors have greater effects in pre-travel phase activities performed before making mobile bookings. Those who consider themselves competent in using their smartphone and those who feel attached to their smartphone are thus more likely to use their smartphones for finding inspiration, search for information, and comparing prices, but to lesser extent more likely to perform typical on-site and post-travel phase activities.

Further, our study confirms the negative influence of mobile users' information privacy concerns that has been found in previous research (Gao et al., 2013; Park & Mo Jang, 2014; Wozniak & Schaffner, 2016; Xu & Gupta, 2009). This influence increases only slightly along the mobile customer journey. This means that information privacy concerns take stronger effect as activities involve more disclosure of personal information (e.g. when making mobile bookings or sharing experiences). However, overall, the effect of mobile users' information privacy concerns across the mobile customer journey is rather small. This may be due to the traditional nature of the activities considered in this study. Recent studies on consumer acceptance of innovative forms of mobile marketing that involve disclosure of different types of personal information (e.g. current location) in return for personalized advertising show that information privacy concerns negatively affect respective attitudes, and so behavioural intention and actual behaviour (Gao et al., 2013; Wozniak & Schaffner, 2016).

For practitioners in the tourism industry, these results have the following implications. First, they must be aware of their target groups' innovativeness: The more innovative they are the more likely they will expect and adopt mobile marketing offers. Also, they might want to consider abilities and attachment regarding the smartphone of their target groups, particularly when early phases of the customer journey are concerned.

Overall, this study has proven the relevance of the identified psychological factors for contributing to predict behaviour along the mobile customer journey. Thus, future research is invited to consider these factors in manifold ways. First, they can provide the basis for segmenting travellers. This can help practitioners to identify traveller segments that are more or less likely to engage in certain behaviours along the mobile customer journey. Knowing what drives such segments' behaviour in different stages of the mobile customer journey helps organizations to more effectively address them and so to ensure they do not lose them to other channels or even competitors. Secondly, this study has considered rather traditional activities along the mobile customer journey, which may be one reason for the relatively small effect of mobile users' information privacy concerns. Further research should thus analyse the identified factors' effects on more innovative en-route and on-site marketing activities that may involve disclosure of different kinds of personal information (e.g. current location) in return for personalized and thus relevant information, recommendations, offers, or advertising. Thirdly, and finally, the results of this study should be replicated with samples from other countries as destinations' visitors, hotels' guests, and airlines' customers naturally stem from various origins.

Notwithstanding its limitations, this study contributes to a more profound and psychologically informed understanding of smartphone usage along the customer journey and might help practitioners to align their mobile marketing decisions with their target groups' preferences and abilities.

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Validation of a Gamified Mobile Experience by DMOs

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Abstract Gamified mobile experiences offer several potential benefits to Destination Management Organizations (DMOs), such as encouraging engagement, enhancing experiences, improving loyalty, or increasing brand awareness of tourists. Moreover, they also offer a new source of interesting information about tourists. However, examples of DMOs applying gamification for the on-site phase of the trip, validation of its impact and exploitation of information gathered from gamified mobile experiences are still lacking. This paper focuses on these issues, presenting a gamified mobile experience generated by three DMOs and validated by real tourists in two villages of the Basque Country during seven weeks. Data obtained both from tourists and from an analytics tool integrated with the mobile experience have been analysed, highlighting the benefits of gamified experiences and the relevance of analytics tools for DMOs.

Keywords Gamification · Mobile experience · DMO · Analytics

1 Introduction

The tourism industry has already used game elements during all the trip phases (Negruşa, Toader, Sofică, Tutunea, & Rus, 2015) such as in pre-trip marketing campaigns of some destinations or in the frequent flyer programs. However, only

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few Destination Management Organizations (DMOs) have developed gamified experiences. Although several benefits of gamified experiences have been highlighted (Xu, Weber, & Buhalis, 2014; Negruşa et al., 2015; Garcia, Linaza, Gutierrez, Garcia, & Ornes, 2016), such as the increase in the duration of visits or the uniform distribution of tourists through the destination, there is a research gap related to gamification examples and the analysis of their impact on tourist destinations.

Gamified mobile experiences provide DMOs with a new channel to interact with tourists, as they do not only allow DMOs to influence the behaviour of tourists, but also open new opportunities to gain insights of their real on-site behaviour. The impact of these experiences can be measured on the basis of analytics tools, so that interaction data traces gathered by the mobile applications become a new valuable information source for DMOs. This information can be used not only to offer better experiences to tourists, but also to improve the decision making process of DMOs. Furthermore, this information might be shared with local tourism service providers to improve their knowledge about their customers.

This new interaction channel and information source might be even more relevant for small and medium sized DMOs, which usually lack resources to measure their impact and access information about the behaviour of tourists on-site.

This paper targets these issues, focusing on the validation of two hypotheses about gamified mobile experiences focused on the on-site phase of the trip. First, three DMOs have defined and generated a gamified mobile experience, which has been validated by real tourists for seven weeks. Finally, in order to provide an additional valuable information source for DMOs, data provided by tourists and analytics data automatically gathered by the mobile experience during this period have been analysed.

This paper has been organised as follows. Section 2 reviews the state of the art of the application of gamified mobile experiences and analytics tools in the tourism and gamification domain. Section 3 presents the research objectives. Section 4 focuses on a gamified mobile experience and its validation by real tourists. Finally, Sect. 5 summarises the conclusions and proposes some future work.

2 State of the Art

2.1 Gamification Applied to Destination Management Organizations (DMOs)

The term gamification was defined by Deterding, Dixon, Khaled, and Nacke (2011) as "the use of game design elements in non-game contexts". Thus, they differentiate gamification from related concepts such as serious games (use of full-fledged games in non-game contexts) or pervasive games (extension of games to new environments). Moreover, gamification aims at changing the behaviour of users for wanted and

desirable activities through extrinsic and intrinsic motivation. The former refers to activities which are only performed in order to achieve some distinct outcome in forms of rewards, while the latter is defined as the performance of an activity for its inherent satisfaction rather than for some separable consequences (Ryan & Deci, 2000).

Although this definition has been broadly accepted, several researchers have proposed further extensions and adaptations for different domains. Interested readers are directed to the work of Seaborn and Fels (2015), who present an updated research about gamification. This research defines the terminology and concepts associated to gamification, and reviews existing literature. While gamification has been applied in several domains, its positive effects depend on the application context (Hamari, Koivisto, & Sarsa, 2014).

Different researchers have studied the application of gamification in the tourism industry (Buhalis, Wagner, & Kingdom, 2013; Xu et al., 2014, 2015; Negruşa et al., 2015; Garcia et al., 2016). However, the level of adoption of gamification among DMOs is very limited (Buhalis et al., 2013). After analysing 44 European destinations, Peretta (2014) concludes that only seven DMOs have mobile applications integrating gamification techniques. Recently, Sigala (2015a) has reviewed gamification examples aiming to influence before, during and after the purchase/consumption of the tourism experience.

This paper focuses on the application of gamification by DMOs for the on-site phase of the trip. On this phase the objective of gamification is to motivate the customers (tourists) to increase the level of their consumption and the use of the firm (destination) products, while also generate enjoyable and memorable experiences (Sigala, 2015a).

Early examples were mainly related to gamified location-based marketing applications such as Foursquare (Cranner, Ahmet, Rost, & Holmquist, 2011). Some real examples (Garcia et al., 2016) include gamified travel tours for urban and rural environments and initiatives such as the Stockholm Sound project promoted by the Visitors Board, or the mobile application Epic Mix developed to enhance the experience of skiers and snowboarders.

Recently, Nunes and Mayer (2014) analyse the acceptance of a gamified mobile experience in a Brazilian nature area, identifying the potential of such experiences to enhance the visiting experience. Lim, Taylor, and Gallacher (2015) present a gamified application for walkers and bikers to generate benefits for local communities of rural tourism areas. They validate its benefits for both tourists, who become aware of local resources; and for local suppliers, who gain a new advertisement channel. The city of Pafos has also created a gamified destination application (Pafos Treasure Hunt) to inform and motivate visitors to explore and learn about the destination. The application has enabled the destination to attract more visitors and to persuade visitors to spend more time and money at places, while providing relevant data about tourists (preferences, feedback, visitation paths, spending behaviour) (Sigala, 2015a).

Furthermore, the “Discover Hong Kong City Walks” mobile application, promoted by the tourism board of the city, offers tourists walking tours in the city, including several interesting points of interests (POIs). Whenever tourists complete at least half of a walk, tourists receive a “stamp” of a tour. This mobile application

has been available since 2011 on Android and iOS devices, accounting for between 50,000 and 100,000 downloads at Google Play (no data on iOS downloads available) (Stadler & Bilgram, 2016).

However, even if there are studies about the benefits of gamification in different domains (Hamari et al., 2014), and despite the previous potential benefits of gamification in tourism, there is still a research gap about best practices and its real impact (Sigala, 2015b). Moreover, DMOs also require examples of tools measuring the impact of these experiences, as the analytics tool presented on the next section.

2.2 *Analytics Applied to Destination Management Organizations (DMOs) and Gamification*

Major parts of tourism information processes and transactions are handled electronically, leaving electronic traces of travel-related activities (searches, trip planning, reservations, feedback…). However, DMOs make limited use of these data (Höpken, Fuchs, Keil, & Lexhagen, 2011). Thus, several systems has been implemented to transform these data traces into valuable information for DMOs. For example, Fuchs, Höpken, and Lexhagen (2014), have developed a Big Data analytics framework to generate knowledge in Swedish DMOs.

Regarding analytics for gamified experiences, Yılmaz and Coşkun (2016) remark that implementation of gamification will contribute immensely to tourism businesses by providing data on consumer behaviour regarding tourism goods and services selection, especially when supplemented by data collected through mobile technologies and smartphones. Analytics are key tools when converting these data into valuable information for DMOs.

Recently, Conley and Donaldson (2015) analyse the process to be followed to measure the benefits of gamification from the beginning of each project, being analytics a key element when deploying gamification initiatives. Focusing on software tools, Heilbrunn, Herzig, and Schill (2014) present a theoretical model of 22 functional user requirements for gamification analytics tools in order to measure the success of gamification projects, to analyse user behaviour and to continuously improve gamification designs. Moreover, they also (Heilbrunn et al., 2014) identify relevant software solutions specifically targeting the gamification sector and evaluate them with their theoretical model, finding that neither of the solutions support more than nine of their requirements.

Nevertheless, most DMOs, specially small and medium sized ones, do not have access to the resources required to develop or integrate a Big Data framework or an analytics tool specifically targeting the gamification experience in their daily processes. In spite of that, these DMOs could use existing generic analytics tools to obtain relevant information about their digital initiatives, among them the gamified mobile experiences.

These generic analytics tools, such as Google Analytics (GA), present several advantages to replace log analysis systems as tools to obtain information about users (Clark, Nicholas, & Jamali, 2014). Additionally, they can generate Key Performance Indicators (KPIs) such as the number of visits, their duration or the return rate that can improve the analysis of the performance of tourism digital activities by DMOs (Moral et al., 2014).

For example, Rebón, Ocariz, Gerrikagoitia, and Alzua-Sorzabal (2015) rely on GA as the tool to analyse the behaviour of virtual visitors from BRIC countries (Brazil, China, India and Russia) to a Web portal of the DMO of Spain promoting the tourism brand of the country, extracting the interest of each section (where to go, practical information,…) and key theme (art, accommodation,…) for each market.

Focusing on gamified experiences, Kuo and Chuang (2016) measure the effect of a gamification initiative integrating both surveys and GA to measure its impact for online academic disseminations, based on the behaviour of users when accessing the platform. Similarly, Wolf, Mulholland, Maguire, and O'Donovan (2014) present a mobile storytelling experience based on scanning QR codes at museums that could resemble a tourism application. For its validation, they rely on analytics provided by GA about page access to identify how often visitors scanned QR codes and to what extent they were likely to follow the story once they had visited the online information about an artwork.

Previous examples show that analytics tools, such as GA, are powerful and cost effective tools that could be applied by DMOs to validate gamified experiences and to obtain data about the behaviour of tourists.

3 Research Objectives

As highlighted previously, on-site gamified experiences may include several potential benefits for DMOs. However, there are only few examples that measure the real impact of these experiences for DMOs. To address this research gap, this paper focuses on the validation of the following hypotheses:

H1: Gamified mobile experiences enrich the visiting experience of tourists

Gamified mobile experiences can enrich the visiting experience of tourists visiting a destination. They have the opportunity to discover the destination more deeply while enjoying the experience.

H2: Analytics tools provide relevant information from gamified mobile experiences for DMOs

The integration of analytics tools in gamified mobile experiences can provide DMOs with relevant information not only about the performance of these experiences but also about the behaviour of tourists in a cost effective way. Such information may offer DMOs and local service providers new insights about tourists and their behaviour while at the destination.

4 Gamified Mobile Experience

In order to assess the research hypotheses, a gamified mobile experience has been designed and tested in two local DMOs (Zarautz and Getaria) in the Basque Country with the support of the Regional Tourist Organization (RTO) (Basquetour, Basque Tourism Agency). The pilot gamification project has been divided into four phases, following the methodology proposed by Bedwell, Slack, and Greenhalgh (2015).

4.1 Definition of the Experience

Within the first phase, main features of the mobile experience have been defined. First, as families are supposed to be receptive to this type of gamified experiences where all of their members can collaborate, families with children visiting the towns in low season have been defined by DMOs as the target user profile for the validation.

The difficulty of the mini-games and the previous technological knowledge requirements should not be a barrier, thus simplicity should be taken into account during the rest of the phases. Regarding the languages, gamified mobile experience is available in four languages (Basque, Spanish, French and English) to reflect the major demographics of the visitors.

Regarding the overall workflow of the gamified mobile experience defined by DMOs, the experience proposes tourists to visit eight POIs, four from each municipality. DMOs have also defined the content (texts and images) describing the POIs and their destinations. Tourists can visit POIs in any order and POIs could have mini-games (questions or check-ins) associated. While questions are multiple choice questions, check-ins require to scan a QR code located at a visible position at the POIs. Finally, a validation of the GPS location of the tourist is required to check they are indeed close to the POI. Correctly answering questions and performing the check-ins give tourists points (one per POI). After gaining three out of eight points (threshold defined by DMOs based on the duration of a regular visit), tourists are shown a survey to evaluate whether the experience has been funny and easy to play, and to send further suggestions. When they send the survey, they obtain a code to redeem it for a real prize at the tourism information offices.

4.2 Development of the Technical Prototype

The gamified mobile experience has been developed by DMOs using the authoring tool described by Garcia et al. (2016). It starts with the selection of the language (Fig. 1a) and a short tutorial (Fig. 1b). Then, a list of the eight POIs is presented (Fig. 1c). Each POI has an icon (an eye) that represents whether it has been already

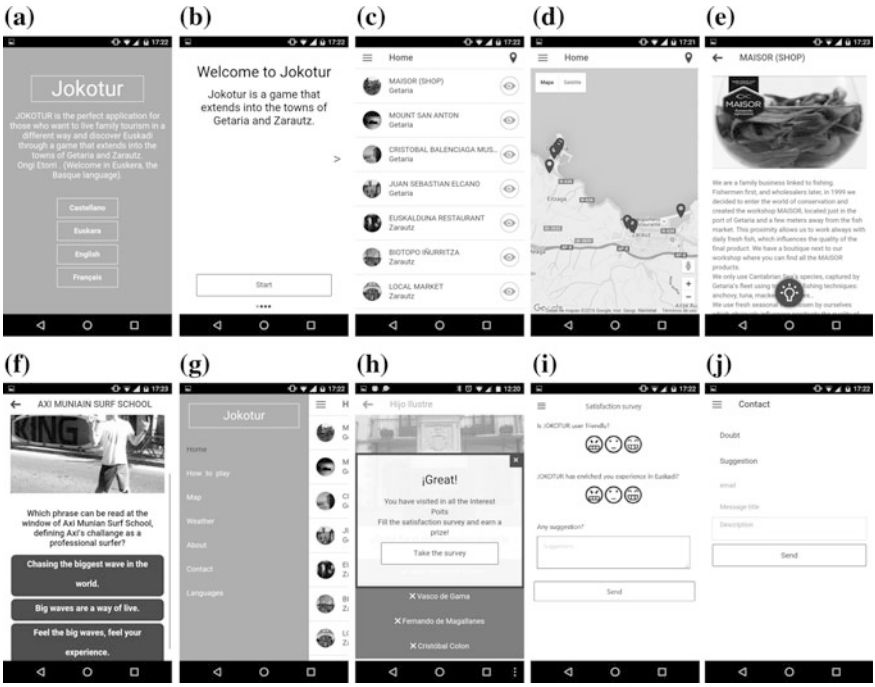

Fig. 1 Screenshots of the gamified mobile experience

visited or not. Selecting a POI shows its details (Fig. 1e) and allows accessing the corresponding mini-game (Fig. 1f). Tourists are informed whether they have successfully fulfilled it and the points left to win a prize. Once they reach this minimum amount of points (three) (Fig. 1h), they are presented a brief survey (Fig. 1i) about the experience and with the code they have to redeem at the tourism office.

Tourists can also select POIs from a map view (Fig. 1d), which shows their current location. Finally, using the main menu (Fig. 1g), it is possible to change the language; enter the tutorial again; consult the weather forecast; access information about the application and the pilot project; and contact the DMOs (Fig. 1f).

The experience relies on Google Analytics to transform the digital traces of tourists into valuable information for DMOs. The default tracking provided by GA has been extended with customised views and events. The former have been defined for each screen of the mobile application (POI, language, tutorial, weather…), while four types of event categories have been defined for the tracking: game, language, survey and contact. Within the game category, the following actions are tracked: check-in, to trace both a successful and unsuccessful check-in attempts; start, to trace the view of the last screen of the tutorial; correct and incorrect answers to question of POIs; new point gain by tourists; minimum amount of points to win a prize reached by tourists; and end of the experience, considered when submitting the survey after reaching the minimum amount of points. Within the language

category, the selection of each option (Basque, Spanish, English and French) is tracked in order to know the use of each one. Survey and contact events are only tracked when tourists perform these actions.

Finally, although it would be technically feasible to continuously track the GPS locations of tourists from the mobile application, this possibility has been discarded due to privacy concerns and negative impacts on the duration of the battery.

5 Validation of the Pilot Project

The validation of the pilot project has taken place from October 9th 2015 to the end of November 2015. Due to the validation nature of the pilot, a limited marketing campaign has been conducted, including a press conference where the three DMOs and the technology provider presented the initiative. The name of the gamified mobile experience has been Jokotur.

Besides the brand image of the pilot experience, leaflets and posters have been printed to describe the initiative and direct tourists through a near field communication (NFC) tag and a QR code to the download pages of Android Google Play and iOS App Store. In order to promote the consumption of local services, the leaflet (Fig. 2) also includes four coupons offering a one euro discount at four private businesses collaborating with the pilot project. The press conference has been reinforced with posts at the Web and the Facebook pages of the DMOs.

After these initial actions, Jokotur has been promoted only at the tourism offices of Zarautz and Getaria, presenting the initiative to families visiting the tourism offices. Finally, paint sets and books, cups, buffs and bags have been available at tourism offices as prizes for tourists gaining at least three points.

The mobile gamified experience has been available for download until the end of November 2015. After this period, the information gathered by the DMOs and GA have been the basis to analyse the results of the validation.

Fig. 2 Promotion leaflet of Jokotur

5.1 Data from DMOs

Staff from the tourism offices have been in charge of the promotion of the experience and the communication with tourists. Due to their workload, they have not been asked to perform additional tasks as interviews to a subset of tourists. For the same reason, it has not been possible to ask local service providers taking part in the validation to gather more information about tourists visiting them.

Although this has limited the amount of data provided by DMOs, it is a common situation for small and medium sized DMOs and tourism service providers. They do not have enough resources to deeper involve their staff in the measurement of the impact of this type of initiatives.

Regarding the acceptance of the application, 70% of the families visiting the tourism offices downloaded the mobile experience. 90% of the downloads were made through the QR code located at the posters of the offices. 22% of the downloads came from iOS devices and 78% from Android devices. Tourists considered the gamified mobile experience was easy to use (average of 2.85 out of 3 responding to the question "Is Jokotur user friendly?"); and it improved their visiting experience (average of 2.7 out of 3 responding to the question "Has Jokotur enriched your experience in Euskadi?").

These results successfully validate the first hypothesis, so that it can be affirmed that gamified mobile experiences enrich the visiting experience of tourists. However, as Jokotur has targeted families with children, more studies are required in order to assure this hypothesis also applies to general tourists.

The small amount of information collected directly by DMOs strengthens the relevance of the integration of automatic measuring tools in the gamified experiences, such as GA, as a data source to analyse the impact of these mobile experiences. These analytics tools neither increase the burden on the staff of DMOs or local service providers, nor depend on them. Moreover, their integration costs during the development stage of the mobile experiences are not relevant; and their interface for DMOs to browse the information is user friendly.

5.2 Data from Google Analytics (GA)

Although the figures provided by GA may not be completely accurate, as is the case of Web pages analytics, they provide a solid insight about the gamified mobile experience.

Data gathered by default by GA already provide interesting information for the validation. During the validation period, 124 tourists used the application, generating 210 sessions and viewing 2.315 screens of the mobile experience. The average session duration was 6 min and 5 s.

The maximum number of active users within a day was 39. After this peak, the average active users during weekends reached an average value between 10 and 15

active users at the first half of the validation, and declined to 2–3 users by the end of the validation period, running within the low tourism season.

Focusing on demographic information of tourists, 82% of them had a mobile phone configured with Spanish as its main language, 12% of them English, 4% Catalonian, and 2% Basque. As the application was used at the destination, analysis of the country and city of the origin of data connections is not relevant, contrary to Web pages or digital experiences designed for the pre-trip phase of the travel experience.

After this initial insight, the data based on custom views and events provide more information for the validation. The most accessed screen was the home, with 1.129 views, followed by details about POIs (616 views), the tutorial (191 views), language (163 views), maps (134 views), weather (40 views), about (25 views), survey (24 views) and contact (20 views). Considering there were 124 unique users, by average each tourist consulted the details of 5 POIs.

The average viewing time was 36 s for each screen. However, tourists spent an average of 1 min and 33 s on the survey screen, 57 s on the POI screen and 53 s on the map screen. The contact page, with just 4 s of average stay, was the least used page of the application. For 28% of tourists, visiting the about screen was their last action before leaving the application, and 20.83% in the case of the survey screen.

As detailed on the previous section, the mobile experience tracked four categories of events: game, language, survey and contact. Tourists launched 883 events, being 85.16% of them related to game, 13.14% to language, 1.59% to survey, and just 0.11% to contact.

From the 752 events related to games, around 40% of them (320) were check-ins (196 correct and 124 failed), 12.9% start of the game after completing the tutorial, 11.57% incorrect answers, 9.84% correct answers, 8.64% new points, 7.58% prize won, and 3.46% end of the experience (survey submitted).

From the 115 events related to language selection, 78.26% change the language to Spanish, 15.65% to Basque, 4.35% to English and 1.74% to French. Thus, only seven tourists used the application in English (five) or French (two).

Within the event marking the submission of the survey, the POIs visited by tourists have been saved as labels of the events. Thus, it is possible to analyse the behaviour of these tourists. Only one out of 14 visited POIs both from Zarautz and Getaria. Although these data only include the tourists that have fulfilled the survey, data give a first insight about the interest of each POI.

The analysis of the information obtained from GA validates the last hypothesis, analytics tools provide relevant information from gamified mobile experiences for DMOs. Besides general information about number of users, devices, and origin of connections, the integration of custom views and events provides further insights on the on-site behaviour of tourists.

The integration of analytics tools on mobile applications is a cost effective opportunity for DMOs to better measure the impact of these applications and improve their knowledge about tourists. Moreover, based on analytics tools, custom KPIs measuring the performance of the experiences (Plaza, 2011) can be defined to ease the integration of this information on the decision processes of the DMOs. For

the pilot project four main KPIs have been defined to analyse its impact: the feedback of tourists (2.7/3), the number of tourists downloading experiences (124), the number of POIs visited globally (320) and per tourist (2.5/8), and the number of tourists getting enough points to get a prize (22%).

6 Conclusions

After a previous analysis of the capacity of DMOs to autonomously generate simplified gamified mobile experiences and their theoretical benefits (Garcia et al., 2016), this paper presents the results of the validation of a gamified mobile experience with real tourists for seven weeks, focusing on the data provided by the DMOs and an analytics tool (Google Analytics) integrated with the mobile application.

DMOs have obtained some interesting conclusions analysing the results of the validation. First, some KPIs have been defined to measure the impact of the experience: the feedback of tourists (2.7/3), the number of tourists downloading experiences (124), the number of POIs visited globally (320) and per tourist (2.5/8), and the number of tourists getting enough points to get a prize (22, 17.74%).

The validation has tackled the benefits of these types of experiences and has highlighted the relevance of gamified mobile experiences for DMOs and tourists. Moreover, DMOs have realised the relevant role that analytics tools such as Google Analytics can play as new information sources about the impact of tourism initiatives and the behaviour of tourists.

The experience has offered a better service to a niche tourism market, while enriching the visiting experience of tourists. Although not enough data have been available to assure it confidently, they also may increase the visiting duration of POIs and balance the distribution of tourists over the destination

While the application of gamification and analytics tools by DMOs for the on-site phase of the trip is still at an early stage of development, the results of the validation show that there are opportunities both to increase the availability of gamified mobile tourism experiences, and to measure them using analytics tools to obtain information about the behaviour of tourists.

Thus, both researchers and industry players are encouraged to further work on gamified mobile experiences providing new services to tourists; and on analytics tools and KPIs that improve the measurement of their impact and extraction of information from tourists by DMOs.

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Part VI
Online Consumer Behaviour

(Dis)Connectivity in the Travel Context: Setting an Agenda for Research

Barbara Neuhofer and Adele Ladkin

Abstract Digital technologies have had a great impact on people's everyday lives and transformed work, leisure and travel contexts. The ubiquitous use of technologies has allowed people to connect everyday life and travel, causing blurring boundaries between once separated domains. A wide body of research has investigated how travel, leisure activities and tourist experiences are enhanced through digital technologies, while the notion of 'disconnection' is only starting to receive attention. This paper fills a gap in that it offers a discussion around connectivity and disconnectivity in the travel context and sets an agenda for further research. Methodologically, this study draws upon secondary research and a thematic analysis of a symposium to develop a comprehensive agenda of six areas for research. This paper contributes to (dis)connectivity, tourist experience and work-life balance discourses in the digital age.

Keywords Digital technology · Connectivity · Disconnectivity · Travel · Research agenda

1 Introduction

Information and communication technologies (ICTs) have become a routine part of people's lives in the developed world, at home, at work and during travel. Recent studies have explored the impact that ICTs had on the way people construct their experiences whilst travelling. Social media and smartphones enable individuals to facilitate and enhance tourist experiences and create added value in numerous ways (Tussyadiah & Fesenmaier, 2009; Wang, Xiang, & Fesenmaier, 2014a). In par-

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ticular, smartphones enable tourists to connect to a range of actors and share experiences with them regardless of physical locations (Neuhofer, Buhalis, & Ladkin, 2014a). These technological and social transformations have contributed to an era of 'constant-connectivity' and an 'always-on culture' (Schlachter, McDowall, & Cropley, 2015), in which travel is technology-mediated and allows for access to anyone, any information, anywhere and anytime (Neuhofer et al., 2014a; Wang et al., 2014a).

Connectivity has however not only changed travel, but also the wider work and life domains insofar that people can now carry out work, leisure, family and travel activities at the same time (Chamakiotis, Whiting, Symon, & Roby, 2014). This means that when tourists travel, they are no longer disconnected but carry their everyday lives with them. In this vein, recent studies have recognised the central role that ICTs play in facilitating tourist experiences. Connectivity can lead to more enriching and socially-dense experiences as people connect to share experiences with others online (Neuhofer, Buhalis, & Ladkin, 2014b; Schmidt-Rauch & Schwabe, 2013; See-To & Ho, 2014).

Beyond a range of benefits, there can however be potential downsides to being connected 24/7. In fact, several scholars have recently advocated the need to discuss possible negative effects that arise when people connect during non-work, leisure and travel time. For instance, being always 'switched-on' can compromise travel in that it creates pressures, whether real or perceived, and can make it difficult to re-charge batteries, reduce stress and leave work behind (Schlachter et al., 2015). Traditionally, leisure time has however been an opportunity to switch-off, re-charge and refresh ourselves (Cohen, 1979). As tourists increasingly connect to family and work on holiday, this may no longer be the case.

While scholarship points to the need to draw attention to the notions of connectivity and disconnectivity, and their consequences, it is surprising that to date only very little research has focused on disconnected tourist experiences, possible motivations for and benefits gained from disconnecting. Only a dearth of recent work has started to debate challenges around (dis)connecting in the tourism domain (Pearce & Gretzel, 2012; Neuhofer et al., 2014b; Paris, Berger, Rubin, & Casson, 2015; Dickinson, Hibbert, & Filimonau, 2016; Neuhofer, 2016; Tanti & Buhalis, 2016).

As a result, this study seeks to highlight the 'flipside of digital technology' to develop a better understanding of why and how people disconnect from ICTs. The aim of this study is to identify key areas of research that could help address some of these questions. This attempt comes at a time, where a few studies have started to state the need for more research on the subject, while concrete directions for research are less defined. The paper defines an agenda for research through four main sections. It first presents a discussion of travel experiences and blurring work-life boundaries in the digital age. Second, the methodology is introduced drawing on a combination of secondary research and a thematic analysis of a symposium focusing on connectivity during leisure time. The third section reveals six areas for research, while the final section concludes with limitations and an outlook into future research and practice.

2 Theoretical Background

2.1 Travel Experiences in the Digital Age

Digital technology and mobile and accelerated lifestyles (Gretzel & Jamal, 2009) have caused a massive change to the way people construct travel and everyday life. As people increasingly connect to their social networks and smartphone devices, it is common for tourists to no longer 'leave home behind', but seamlessly engage, communicate and share travel experiences with friends, families, work and social circles online (Kim & Tussyadiah, 2013; Neuhofer et al., 2014a). The convenience of connecting with others has interlinked travel and everyday life (Wang et al., 2014a).

However, not until long ago, leisure travel was perceived as the reversal of everyday life. It was a means to escape from home and leave the mundane behind (Cohen, 1979). This appears to be no longer entirely the case. Escapism is increasingly fading, as digital technology has opened an 'era of connectedness' (Neuhofer et al., 2014b; Neuhofer, 2016). Tourists are more likely than ever before to experience the travel environment, i.e. a tourism destination, while staying connected and engaging with physically distant environments. Travel is no longer an 'isolated event', but extends to physically and virtually spheres at the same time (Neuhofer et al., 2014a, b). This renders tourist experiences a simple extension of everyday life (Wang et al., 2014b).

As a result, this study poses the critical question whether 'disconnecting', 'switching-off' and 'going off the grid' is still an option for contemporary tourists in the digital age? And, if it is an option, the question is whether there is any deeper motivation to switch off? And, what are possible consequences on tourist experiences, work and wellbeing, if people have lost the ability to switch-off? As these questions arise, it is worth going beyond tourism-situated debates and form a discussion of the psychology, occupational health, human resources and wellbeing domains.

2.2 The Impact of (Dis)Connectivity on Travel, Home and Work Domains

In taking a multi-disciplinary view, it is evident that a wide body of literature examines the implications of being (dis)connected in relation to home, work and leisure. A consensus forms around the idea that ICTs are a catalyst of change (Neuhofer et al., 2014a) that compresses dimensions of space and time (Schwab, 2015), and merges boundaries between different life domains. While work was traditionally performed in work spheres, and leisure activities occurred during designated leisure times, these distinctions have become less clear. Technology enables people to seamlessly carry out activities whenever and wherever needed

(Chamakiotis et al., 2014). This calls for a revival of the work-life balance debate to re-define what work-life separation and balance means in the digital age.

A well-established body of research explores how ICTs have altered work practices and relationships to home (Nansen, Arnold, Gibbs, & Davis, 2010). ICTs impact on the work-life balance and create an always-on culture, which can be positive or negative. For those who are part of the 'switched-on' culture, technology use increases permeability between work and life (Valcour, 2007), and arguably these blurred lines can contribute towards an unhealthy work-life balance (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). A 'healthy' work-life balance is a cornerstone of good personal relationships, health, mental wellbeing and productivity and satisfaction in life and the work place (Beauregard & Henry, 2009; Khallash & Kruse, 2012). By taking a wider organisational health perspective, employers therefore have an interest in ensuring that their workforce takes a break from work and technology …… which leads us to travel.

In the tourism literature, potential drawbacks of ICTs use are not (yet) widely discussed. Pearce and Gretzel (2012) were among the first to draw attention to disconnected tourist experiences and explore what happens if connectivity is disrupted or lost in so-called 'digital dead zones'. In reviewing recent years' ENTER conferences, several authors have expanded the debate on connectivity aspects in travel. For instance, Paris et al. (2015) investigated technology-induced tensions when tourists are 'unplugged', while Neuhofer, Buhalis, and Ladkin (2015) identified enablers and barriers that make or break connected tourist experiences. Tanti and Buhalis (2016) analysed the drivers of connectivity and the consequences of being (dis)connected, while Neuhofer (2016) explored how value is potentially created or destroyed, when tourists are connected during travel. In addition, a study by Dickinson et al. (2016) examined the use of mobile technologies and tourists' desire for disconnection at campsites. By contributing to this emerging stream of research, the methodological approach underpinning in this paper is discussed next.

3 Methodology

This paper draws on a combination of secondary research and a thematic analysis of the discussions of a recent symposium on the topic of connectivity in the leisure context. The analysis was driven by the question: 'What are the emerging areas of research on (dis)connectivity in the travel context?' First, existing research on the subject of tourist experiences and work-life balance in the digital age was reviewed. This helped to develop an understanding of the status-quo of the literature, emerging discourses and current gaps in knowledge. This literature review process was fundamental to selecting the themes that were subsequently discussed in the symposium and to contributing to the discussion of this paper.

Second, a thematic content analysis was conducted to analyse the narratives emerged at the half-day symposium "Going off the grid: Can employees really switch off during travel?", taking place in spring 2016 in the UK. The symposium

featured 12 invited speakers and a panel discussion. Speakers were carefully selected to represent and contribute from a wide range of disciplines, including tourism, geography, occupational health, psychology, wellbeing, human computer interaction, user experience design, and human resources. The symposium was audio and video recorded with the software Panopto, resulting in a total of 4 h of raw recordings, which were subsequently transcribed verbatim. A manual thematic analysis process was performed to code the data into a set of initial codes and final themes that are representative of the research themes presented next.

4 Findings: Defining an Agenda for Research

The thematic analysis reveals six main themes that formulate distinct areas for research. These are (1) connectivity and fluid life integration, (2) dis(connectivity) and work-based challenges, (3) dis(connectivity) and social obligations and family roles, (4) dis(connectivity) and health and wellbeing, (5) dis(connectivity) and the self, and (6) disconnectivity and digital detox. While these are the dominant areas identified through the symposium and the literature, these areas may not be exhaustive and further research avenues may develop as research in this field continues to progress.

(1) ***Connectivity and fluid life integration***

The first emerged theme concerns the notion of 'connectivity and fluid life integration' as through technology travel and life are no longer separated. The discussion formed around the idea that ICTs lead to blurring lines and 'fluid boundaries' that enable people to integrate all life domains. In the centre of this debate stands the value of all-time connectivity, which enables to reach, and be reachable for anyone, anywhere and at any time. This view is consistent with recent work on smartphone use that considers travel as a mere extension of everyday life (Wang et al., 2014a), while it questions previous assumptions that portray travel as a distinct space and 'leaving home behind' (Cohen, 1979). Life domain integration is an area worth exploring, as travel, home and work aspects blur and spill-over into the travel domain.

> We use the phone not as a phone, but as a connection device.
>
> Being wired has transformed my life. I am wired all the time. I hate being offline. I feel connected to people I know online and I know offline. The world I don't see any distinctions between those things.
>
> It's not living here and working there, and resting somewhere else. It's about doing everything together.

A second major discussion focused around the idea that switching-off might not be a desired option, as people increasingly connect and manage all aspects of life from their smartphone. Travel in particular is an area where decisions around (dis)connecting are determined by convenience versus drawbacks.

> Let's have a look at Twitter's mission statement. 'To give everyone the power to create and share ideas and information instantly, without barriers.' …let's think about instantly and without barriers… what does this mean? We assume that we need technology that works and connectivity that works.

> When we apply new technology, such as AR we can create seamless experiences. Until we are able to create seamless experiences, where technology moves in and out of our lives, it's no longer a matter of choosing to turn on and off. It is there when we need it and it's not there when we don't need it.

The use of smartphones in travel has multiple purposes, e.g. to find information, navigate on-site, check updates and share experiences with others (Munar & Jacobsen, 2014; Wang et al., 2014a). Subsequently, the smartphone is perceived as an integral part of life that renders it difficult to switch-off and leave life aspects behind. This idea was recently recognized by Dickinson et al. (2016) who call it a 'dilemma', as people struggle between wanting to connect and disconnect at the same time.

A second area of interest focuses on differences in (dis)connectivity behavior, depending on travel types and travel modes. Leisure and business travel were highlighted as distinct practices, as far as desired connectivity and technology-enabled work overlapping in travel time is concerned. While there was an indication that people may be more inclined to disconnect (and thus switch-off from work) during leisure travel, connected business travel was seen as a time where productive work an be done, if so-called 'infrastructure enablers' are provided (Neuhofer et al., 2015).

> Travel time is an opportunity to do something. It is also an opportunity to do nothing. And also the idea of transitioning from one place to another.

> The length of the journey can impact on the things you do or want to do…You may vary a whole host of things across the trip. You might spend the first hour of your trip sorting out your presentation, do a bit of reading, and then at 9 o'clock do your emails… So you might use the time across the journey in different ways.

This area calls for a more distinguished discussion of (dis)connecting and its implications on various travel modes. It is not about connecting versus disconnecting, but about recognizing that different travel could benefit from contextual (dis)connectivity.

(2) ***Dis(connectivity) and Work-Based Challenges***

The second theme focuses on the impact work-related issues have on (dis)-connectivity in tourist experiences. The debate reveals that the ability to switch-off during leisure time is often determined by work type (knowledge work, manual work) and work modes (flexible working, working from home, part time or full time), which influence the extent to which individuals feel they can switch off when away from work. In particular, the prevalence of flexible working arrangements in the case of knowledge workers can frequently lead to issues around work and non-work related activities and spaces.

> The workplace is a really interesting time now. I would say I don't have a workplace and yes, I am employed and I have an office. But I don't spend a lot of time there. A workplace is no longer a location where people gather for 8 h a day and rush out the door at the end. I spend my time travelling on planes on trains, meeting clients and customers. And this involves me being connected. And connectivity is really an important part of that.

> I don't see my work as a 9/5…I'm constantly juggling both, and it is not as simple as dividing a block of my day. I assume that my sacrifice is that by bringing in personal things into my working hours, this means that I overflow and my work happens in my life time, my off-time… it does run through evenings and weekends.

> There is some opportunity to be connected. In particular how you use your time flexibly to be connected… You can use digital media for play and work.

While a consensus forms around the idea that flexible work modes offer a variety of benefits, a deeper understanding is needed about the current practices of how individuals deal with work and leisure in an always-on culture. Individuals attempt to come up with coping mechanisms, while supportive guidelines are absent.

> People keep switched on via their devices, they keep checking their emails, they see what is going on at work. The problem is that this provides a constant stream of information for work, new problems to solve…It makes it even harder for us to switch off, if our devices are switched on.

> I started to use auto-reply and say probably sending me an email does not guarantee you an answer. We might have this issue in the future about connectivity to Internet and social networks and wellbeing in the workplace.

> It is really important to set expectations with your colleagues…People have these out of office emails saying I am on holiday, I will not check my emails and reply on my return, but they will reply anyway straight away… that forms an expectation of me towards others, that when I am on holiday, I reply to emails. If you have an out off office email, stick to it.

A second main theme emerged in the occupational health domain, suggesting that only a dearth of organizations to date provide guidelines that could help employees deal with the increasing challenges that emerge as digital technologies connect work and life. There also exists a great ambiguity in relation to whose responsibility it is to manage a healthy work-life balance. Is it an organization's or an employee's responsibility to ensure that one switches off and takes a rest from work? Do employers have a 'duty of care' of what happens to employees outside the work time, i.e. on holidays? The analysis suggests that there is a current lack of organizational policies and guidelines. Decisions around appropriate (dis)connectivity are mostly left to employees. While there exist policies for technology use behavior *in* the workplace, guidelines for switching-off *outside* of work are overlooked.

> What can good organisations do? JP Morgan and Barclays have got a protected weekend policy. Atos, French IT company, they have banned internal email from 2011…Daimler have gone a little bit more technical to turn off emails out of office hours and automatically delete emails sent to staff during annual leave and holiday.

> I am not sure it needs a policy… but I don't think it does need something around local arrangements and expectations on a general premise. That we try to discourage people to work outside of hours.

In summary, the analysis reveals a major debate around 'sole versus shared responsibility' between employers and employees and a lack of clear guidelines of what is expected in terms of (dis)connecting. For instance, a line manager may send emails over the weekend and the employee may feel pressured to respond right away, while there is no expectation from the organization to respond until the next work day. Currently, there is no consensus on expectations, but there is a clear agreement on the fact that a wide range of 'unwritten rules and expectations' exist, leading to challenges in both, the work place and leisure time. This calls for a research and practical organizational agenda to clarify availability expectations and how firms can help employees with (dis)connectivity during leisure time. Research could clarify availability expectations and identify best-practices on how to cope with the 24/7 connectivity, whilst minimising adverse health implications during leisure time.

(3) ***Dis(connectivity) and Health and Wellbeing***

The third theme focuses on notions around health and wellbeing. One of the driving questions was, "*whether at all, we still need to switch off?*". Is Cohen's (1979) idea of travel as a means to 'take a break' from everyday life still a valid concept? The analysis highlights an emerging body of research in the occupational health discipline, that focuses on the intersection of work-life balance, health, rest, recovery and wellbeing. Schlachter et al. (2015) explores how remaining 'switched on' affects non-work time, which formed a distinct debate in the symposium.

> Non work time is an ideal time to replenish our resources. That's not a trivial thing. There has been research on the short-term and long-term effect of not recovering enough… In the long-term, people who never switch off and recharge their batteries have a higher risk of dying a cardio-vascular death. It might work fine for now, but it might bite you in a couple of decades.

> Don't work while on holiday. Holidays are a bit like mobile phones. If you consider charging your phone in the evening for half an hour, it might get you through the next work day, but not much longer. With holidays, it is a long period of time where you can actually fully recharge your batteries.

> If you look at industries, such as drugs, gambling and alcohol, you find always warning messages: on cigarettes, that smoking harms, gamble reasonable, drink reasonably. But we don't find that in gaming and social networks. Have you seen Facebook telling you, you have been on Facebook for three hours.

Recent work recognizes negative effects of not switching-off on health and well-being (Chong et al., 2014). Tourism research has a long tradition of stating the positive effects of taking a holiday to restore physical and mental health (Urry & Larsen, 2011). These effects seem to be more relevant than ever before, as people struggle to switch-off during holidays, causing impaired recovery from work and creating work-life conflicts (Chong et al., 2014), leading to burn-out (Smith & Puczkó, 2009). The reasons as to

why people seem to be *unable*, or *unwilling* to switch-off are less clear. One of the possible causes explaining the inability to switch-off is 'technology addiction'. Scholars have started to discuss addiction to digital devices, suggesting that people can be addicted to technology, and suffer negative consequences, such as stress, reduced productivity, lack of sleep and disconnection from reality as a result of it (Ali, Jiang, Phalp, Muir, & McAlaney, 2015). As people connect during their holidays, one interesting avenue for research could be to link digital addiction and ICTs use during travel.

(4) ***Dis(connectivity) and Social Obligations and Family Roles***

A fourth theme emerged around the idea that people are unable and unwilling to disconnect during holidays because of social obligations and family commitments. There appears to exist a wide shared 'internal obligation' to connect, often related to social roles. The discussion reveals a perceived need to be 'reachable for others', creating a sense of 'being unable to disconnect'.

> A key issue is about expectations around technology use. Do I have to be available or not? There are often a lot of misperceptions of what others expect of us. A lot of the time with expectations they are not communicated. So I just assume everyone thinks that I need to be available, but actually never ask anyone do they expect it or not.

Research could expand on recent work-life balance discourses relating to the family domain (Campbell, 2000; Bergström-Casonowsky, 2013). While work examining how individuals cross-over and navigate between work and family has a strong foundation, it has yet to be explored in the context of leisure travel and social family obligations. In fact, it would be valuable to have a deeper understanding of family roles and rituals, and the necessity to be connected when tourists are away from home. A second discussion topic relates to the inability to switch-off because of the need to be online, monitor work emails, and 'fear of missing out', commonly known as FOMO. The discussion highlighted that (dis)connectivity choices may be contextual. This is worth exploring as it might relate to responsibility division and gender, as more women than men continue to be involved in home and family matters even when they are the ones who are away (Bergström-Casonowsky, 2013).

> The other thing is… the fear of missing out. The important thing that is going on we might not know about it. This fear is socially constructed. We did not have that fear 10 or 20 years ago. So it is really part of that always-on culture that we are thinking we are missing out on something.

> Work-life balance is a term we use a lot. And it is a state of aspiration, really. It has to be for the individual. There might be other responsibilities in the home environment, this might be gender but in general responsibilities, could be children, could be caring responsibility for family members… there is a lot of context to wrap around that life, and we are all different.

> People fear that if they do not monitor their emails while on holiday, they think that there might be an emergency at work. They need to save the day.

As family obligations and FOMO exist, there appears to be value in 'social connectedness' through digital technology. Travellers may not want to feel spatially isolated when travelling, but keep in touch with home and share experiences with

others online (Munar & Jacobsen, 2014; Neuhofer et al., 2014b). At the same time, much ambiguity exists around (dis)connecting (Dickinson et al., 2016), as people want to fully immerse themselves at the destination, while desiring to take advantage of technology-mediated connectedness and social relations with home (White & White, 2007; Neuhofer et al., 2014b; Wang et al., 2014b; Dickinson et al., 2016).

(5) ***Dis(connectivity) and the Self***

The fifth dominant themes highlights the notion that ICTs use and decisions around (dis)connectivity are inherently subjective and individual. In recognising the contextual nature of (dis)connecting, a consensus formed around the fact that there is no universal answer as to why and how people connect or disconnect. Instead, much debate pointed out that (dis)connectivity is about '*one's own choice*', '*own personality*', '*own perceived pressure*', and '*own lifestyle*', and also '*generational'* differences.

> It is a matter of balance and personal preference.
>
> It's a generation thing. I see that young guys and looking at them at the gaze of people who are digital immigrants. This is a very different world that is coming up.
>
> It would be interesting to talk about generations. When digital natives come to the family age… where they have children of five, six or seven going to school, with all the needs and contact requirements that children have, that will be quite an interesting phase.

(Dis)connectivity is not only framed by institutional, organisational, infrastructural or social boundaries, but is ultimately determined by the characteristics of the end-user. Opportunities for research exist as there is little knowledge about what drives (dis)connecting behaviours. Is it about differences in gender, age (digital natives vs. immigrants), culture, personality or economic contexts (first world problem only?)? While there is an impression that ICTs use behaviour is related to generations, this needs further empirical confirmation. Overall, more understanding about 'the self' and contextual situations and choices is needed, and how these influence people's decisions to connect or disconnect.

(6) ***Disconnectivity and Digital Detox***

In contrast to the first theme, relating to 'fluid life integration', a final theme evolved around the idea of complete disconnection, commonly referred to as 'digital detox'. As people are (or perceive to be) connected 24/7, there is an increasing interest in going the opposite way, i.e. switching-off for a specific period of time. The discussion reveals that people are experimenting with disconnecting, either for a change or for health and wellbeing reasons and to try out going on digital-detox retreats.

> It is really important to stich off our head once in a while, as if we thinking about work and we keep draining our battery. So we really need to switch off to allow that recharging process.

> One of the things we picked up was the tension between families and couples of other people being digitally disconnected and them not wanting the other person to be digitally connected. It is about being connected and how other people feel about it.

Digital detox, implying a diet from the use of digital technology, is particularly relevant for the travel context in which it has gained recent attention (Dickinson et al., 2016). For instance, 'Camp Grounded' in the Unites States offers an analogue camp to switch off, 'Time to log off' offers digital detox retreats in the UK's countryside, and hotels, such as Grand Cayman Marriott provide 'tech-free zones'. In line with the notion of 'technology addiction', the debate pointed to an interesting fact that when smartphones and Wi-Fi are available, people feel an 'internal urge' to connect. There mere possibility of connecting appears to keep people from disconnecting. However, one important thought raised was: "*Just because people can be always connected, doesn't mean they should be.*"

In a response to a perceived 'inevitable' connection, digital detox has emerged as a temporary solution to switch off. While these packages may not be the answer for every type of travel, it was noted that ICTs could diminish the quality of travel, if used too extensively. This confirms recent work, suggesting that connectivity could generate barriers to escapism and create a 'momentary mental absence' as tourists interact online (Neuhofer, 2016; Tanti & Buhalis, 2016). Research could develop a better understanding of the motivations that drive people to go off the grid.

5 Conclusion and Recommendations

Digital technologies have made a significant impact on various aspects of people's lives. By drawing attention to the leisure and travel context, recent scholarship has expressed a high interest in investigating mobile lifestyles, connected tourists and technology enhanced travel experiences (Gretzel & Jamal, 2009; Neuhofer et al., 2014a; Neuhofer, 2016). With research on digital technology rapidly evolving, this study aimed to look at the 'flipside of technology' and shift the attention to the challenges that emerge around (dis)connectivity in the travel context. Six areas were identified in a comprehensive agenda that shall highlight current knowledge gaps and offer directions for further research.

The study's limitations are that it draws on secondary research and exploratory insights from a symposium on the subject. As a result, it is acknowledged that the presented research areas are by no means exhaustive, but the study hopes to provide some initial guidance and stir a discussion to unresolved questions where attention from scholarship and organisational practice is needed. To address the limitations of this work, empirical work is needed to confirm preliminary assumptions and stakeholder meetings, sandpits and organisational focus groups could be organised to gain interdisciplinary and practice-led views on the subject.

With this agenda, this study maps out areas for research and hopes to open a debate that goes beyond digital technology in order to have a more accentuated discussion around the 'paradox' of connectivity and disconnectivity during leisure time, and wider work-life contexts. It is hoped that the presented avenues for investigation will benefit academics in conceptual and empirical developments and help practitioners to understand challenges and opportunities in travel-related connectivity and disconnectivity in the digital age.

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Impact of Destination Promotion Videos on Perceived Destination Image and Booking Intention Change

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Abstract Destination promotion videos (DPVs) are increasingly being used for online marketing and seen by travellers during the information search process. Yet, scholarly attention to DPVs is scarce and the research question of "how do DPVs influence viewers' destination image change?" is unresolved. To fill these voids, this study (1) examines the projected image of Macau based on the video content analysis of their latest DPV; and (2) investigates the impact of viewing a DPV on viewers' perceived destination image and on their behavioural intention to visit Macau. The efficacy of repeating—a framing method introduced by Entman (1991)—in influencing change in the DPV viewers' image of the destination is highlighted. Findings from the experiment indicate that the content of DPVs and repeating certain shots are effective in positively enhancing travellers' perceived destination image as well as triggering potential travellers' interest in further researching and visiting the destination.

Keywords Destination promotion video · Visual destination image · Framing analysis · Projected image · Macau · Video content analysis

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1 Introduction

With a long history both in academia and industry, destination image is among one of the most researched areas in tourism and hospitality literature. Pike (2002) identifies and reports that 142 destination image articles were published in academic journals during the period 1973–2000. A recent study by Dolnicar and Grün (2013) notes that a total of 86 articles on destination image were published in the top three tourism journals between 2002 and 2012. The high level of interest in destination image can be explained by the acknowledgement that destination image affects one's destination preference, attitudes towards and intention to visit a travel destination. Wang and Hsu's (2010) study suggests that tourists' overall destination image has an indirect impact on their behavioural intentions through satisfaction. The meta-analysis study by Zhang and colleagues (2014) also corroborates that an individual's destination image has the greatest impact on his/her behavioural loyalty (i.e., visit intention and revisit intention) and attitudinal loyalty (i.e., intention to recommend).

Among all published studies pertinent to destination image, the majority are dedicated to the measurement of destination image perceived by tourists or potential tourists and/or projected by the tourism authorities of the studied countries, cities or attractions (Gallarza, Saura, & García, 2002). Indeed, considering the prominent role and influence of destination image on tourists' decision making, it is understandable why much scholarly attention has explored what sort of desired image destination marketing organizations (DMOs) select to project and how they project these images to target audiences. Gartner (1994) notes that DMOs can embrace a wide range of induced media (e.g., print pamphlets and television commercials), autonomous media (e.g., travel guidebooks, movies and news) and organic media (e.g., word-of-mouth from previous visitors) to convey the desired image to the audience. Since media—serving as an image broker or image agent carrying the projected image of a destination (Pan, Tsai, & Lee, 2011)—play a significant role in destination image projection, many studies have been conducted using various media or information sources such as government promotion documents (Andreu, Bigne, & Cooper, 2001), television commercials (Pan et al., 2011), travel guides (van Gorp & Beneker, 2007) and travel magazines (Hsu & Song, 2013).

Though projected image reflected in various media has been extensively examined, destination promotion videos (DPVs)—a media widely used by DMOs to address an audience wanting to imagine and fantasize about a destination—are scarcely researched (Alvarez & Campo, 2011; Shani, Chen, Wang, & Hua, 2010). Like television commercials, the creation of a DPV involves the selection and emphasis of certain themes, frames and scenes. These three attributes, together with the transcript spoken by the characters, are expected to embed manifest and latent images that DMOs would like to convey to the audience. In other words, analysing

the frames and other attributes in DPVs can extract what is the desired destination image that DMOs would like to project to the audience. DPVs have long served as an image projection agent of many destinations and they are now easily found by a larger audience due to the emergence of media sharing sites (e.g., YouTube and Instagram). Yet, to the best of the authors' knowledge, no systematic approach has been introduced and no study has attempted to examine the projected image reflected in DPVs.

In addition to the limited research on the examination of projected image in DPVs, the effectiveness, influence and persuasiveness of DPVs has seldom been a matter of prime interest by academic researchers. MacKay and Fesenmaier argue that visual media can serve as a miniature of pieces of information connected with places. Videos, thus, appear to be powerful marketing tools enabling the destination to communicate a variety of images in a compressed format (MacKay & Fesenmaier, 2000). Tussyadiah and Fesenmaier echo and complement that videos are a powerful tool to convey people's dreams and fantasies of visiting the destination. Furthermore, they generate mental pleasures through imagination and intensify the motivation to visit the destination (Tussyadiah & Fesenmaier, 2009). Among all existing destination image literature, Alvarez and Campo (2011) as well as Shani et al. (2010) are the few who attempt to investigate the impact of promotional videos on viewers' image change. Shani et al.'s (2010) study reveals that viewers' perceived image becomes significantly more positive after being exposed to the promotional video. Yet, the video used in their experiment is produced for the XXIX Olympic Games but not exclusively for destination marketing. Alvarez and Campo's (2011) study redresses this and utilizes tourism promotion video as the research stimuli. Their study, however, solely examines "if DPV influence viewers' perceived destination image change". The question of "how DPVs influence viewers' destination image change?" is still largely unresolved.

To fill these research voids, using the DPV (entitled "Experience Macao your own style"—https://www.youtube.com/watch?v=bPxU_FKezr8) produced by the Macau Government Tourism Office as a study object, the aims of the current study are: (1) to examine the projected image of Macau based on the video content analysis of their latest DPV; and (2) to investigate the impact of the DPV on viewers' perceived destination image as well as on their behavioural intention to visit Macau. The second objective will be done by investigating the efficacy of repeating - a framing method introduced by Entman (1991)—in influencing change in the DPV viewers' image of the destination. The findings of this study contribute to the literature by analysing the efficacy of a framing strategy in influencing image of a destination. From the practical perspective, this study will provide insights for destination marketers in designing audio-visual media for promoting their destinations.

2 Literature Review

2.1 Destination Image of Macau

Known as the "Las Vegas of the Orient", the Macau tourism industry has been thriving over the past decade. Based on the official statistics provided by the government (Statistics and Census Service, 2015), Macau received 30.7 million visitors and MOP13.05 billion (USD1 = MOP7.9) in tourism revenue in 2015. Despite its tremendous growth, Macau's tourism authority has long been advised to diversify tourist arrivals beyond the current over-reliance on the Chinese market. As diversifying its image and thereby attracting tourists with different needs is deemed to be a decent practice for assuring the sustainable development of Macau's tourism industry, numerous scholars have examined Macau's projected image on various media and suggested recommendations.

Hsu and Song conducted multiple studies about projected images of Macau in travel magazines' articles. Using Beerli and Martin's (2004) classification of destination image, one of their studies reports that "culture, history and art" is the most frequently mentioned destination image category among the analysed travel magazines' articles, followed by "leisure and recreation" and "tourist infrastructure" (Hsu & Song, 2013). In the category of "culture, history and art", cuisine and food were the dominant attributes while snack, churches and history were also frequently mentioned in travel magazines. As the Internet is becoming the primary source for researching travel- and destination-related information by travellers in the 2000s, Choi, Lehto, and Morrison (2007) attempt to identify the image representations of Macau on the Internet via analysing the narratives and visual information on multiple online sources (including Macau's official tourism website, tour operators and travel agents' websites, online travel magazines and guides as well as travel blogs). The content analysis results reveal that Macau is projected as a destination with a unique mixture of Portuguese and Chinese culture as well as an international city with many old buildings, heritage attractions and modern facilities. The results further indicate that the official tourism website painstakingly stayed away from the "casino" and "gaming" destination image. Instead, the official tourism website is mostly related to a culture-oriented image. Cultural events and facilities are highlighted on the official tourism website.

Considering the acknowledgement of differences in cultural background and knowledge about Macau between Chinese-speaking tourists and English-speaking tourists, Tang, Choi, Morrison, and Lehto (2009) subsequently explore the similarities and differences in the projected images in Chinese and English language websites. Harnessing the content analysis and correspondence analysis, the empirical findings lend evidence for the Macau tourism authorities to build a Macau image associated with heritage and cultural resources (Choi et al., 2007). Although the destination website strived to highlight Macau as a destination with many heritage and cultural resources, this desired image of Macau was not effectively communicated via the third party websites like travel agencies, travel magazines

and travel guidebooks. As the empirical evidence from prior studies generally confirms that Macau's tourism authority has been attempting to place less emphasis on its gaming reputation but focus on the cultural facet and cultural heritage on their destination promotion program, the DPV produced by them is expected to be aligned with this strategy. Hence, the first hypothesis postulates that:

H1: The frequency of "gaming" (under "Tourist leisure and recreation" category) related scenes in the analysed DPV is lower than that of other image attributes in the "Culture, history and art" category.

2.2 Role of Information in Destination Image and Behavioural Intention Change

The significance of information on image formation and image change has been widely recognized by researchers. Despite the existence of inconclusive findings, previous literature generally reports that exposure to travel information results in destination image improvement (Baloglu & McCleary, 1999; Beerli & Martin, 2004). Beerli and Martin (2004) report that the organic (e.g., advices from friend and parents) and autonomous sources (e.g., travel guidebooks and news) influence viewers' cognitive impact positively. Alvarez and Campo's (2011) experimental study also exhibits that tourism promotional information improves viewers' perceived destination image of Turkey. Fakeye and Crompton (1991), in their study conducted in the lower Rio Grande Valley in Texas, posit and empirically verify that first-time and repeat visitors share significantly different images of a destination. Besides Fakeye and Crompton (1991), several researchers suggest the extent of improvement derived from the exposure effect varies between non-visitors and repeat visitors. McKercher and Wong (2004) note that repeat visitors are often destination-aware tourists who typically develop their images out of previous experiences, while non-visitors establish their images of the destination through information from external sources. Drawing on the previous findings, the second hypothesis proposes that:

H2: The impact of DPVs on viewers' destination image and behavioural intention change varies between repeat visitors and non-visitors.

2.3 Framing and Repeating

According to Fakeye and Crompton's (1991) seminal paper, destination image as a mental construct is formed based on a selected few impressions among the flood of total impressions. Following this proposition, many researchers argue that framing might be involved in forming a destination image (Pan, 2009; Pan et al., 2011).

Defined as the process of selection, emphasis and salience, Entman (1993) notes that framing is "to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the items" (p. 52). Indeed, the image formation process of an individual may include screening, filtering, weighing and others. Similarly, from the destination marketers' perspective, framing is also involved in the image projection process because marketers can select and emphasize certain frames of their destination in the DPVs in order to facilitate the formation of desirable images as well as to screen out undesirable and negative ones.

Among all framing methods, Entman (1991) proposes that repeating is a prominent one that can make certain attributes more salient so as to be recognized by the audience. In the DPV context, repeating generally refers to increasing the appearance of a certain attribute in the promotion material. Although this method has been proposed in the 1990s and some tourism scholars mention this in academic discussions (e.g., Pan et al., 2011), no study has attempted to test this approach so far. As DPVs are produced on the belief that viewers' image of the promoted destination can be improved and their travel motives can be activated via projecting the desired facets and experiences, repeating is expected to be effective in enhancing viewers' perception of the destination attributes. Hence, the third hypothesis proposes that:

H3: Difference in viewers' rating on image attributes before and after viewing will depend on the frequency of exposure to those attributes in the DPV.

3 Methodology

3.1 Study Object

As noted earlier, the DPV entitled "Experience Macao your own style" which is produced by the Macau Government Tourism Office was chosen as the study object. The recency of the DPV is the primary reason for choosing this. Since the video was published in March 2016, it is expected that not many people watched it before and the influence of previous watching experiences can, thus, be minimized. The Macau Government Tourism Office produced six different videos and all of them shared the same title of "Experience Macao your own style". The duration of the videos is 3 min for three videos and 5 min for another three videos. The text in the videos are available in English, Simplified-Chinese and Traditional-Chinese, to target different audiences. For this study, the 3-min video in English was chosen.

3.2 Video Content Analysis

To achieve the first objective and test the first hypothesis, a video content analysis was conducted. Dimitrova and colleagues (2002) claimed that segmenting a video document into shots (or scenes) and extracting key frames are the first two steps of video content analysis in order to facilitate accurate content access to video data. Following their systematic approach, a coding scheme was firstly developed so that each shot can be coded for further analysis. In the current study, Beerli and Martin's (2004) classification of destination image was used as the coding scheme due to its proven soundness in prior studies. Although various features (e.g., caption and music) could be extracted from a video to better understand visual content, this study only included the visual content (i.e., video clip) for extraction and analysis.

Video structural analysis, referring to the process of decomposing an atomic video sequence into fragments, was conducted using iMovie (video editing software). We chose one second fragments as the means of decomposition, accordingly the 3-min DPV was decomposed into 180 distinct fragments. Video indexing, referring to the assignment of each fragment to the most appropriate category in order to build an indexing structure, was conducted manually by the lead author and another undergraduate student. The two investigators individually classified each fragment into the most appropriate primary image category and secondary image attribute according to Beerli and Martin's (2004) classification, and recorded the classification results into an Excel spreadsheet. For instance, the thirty-six second of the DPV shows dishes which are bun with deep fried pork chop, boodle with shrimp eggs and roasted whole pig. This fragment was classified into the primary image category of "Culture, history and art" and the secondary image attribute of "Gastronomy". Results were then cross-checked to verify the accuracy and reliability, and no variation was found. After finishing the above tasks, the features of each fragment are identified. Aggregating features of all fragments and presenting them in a timeline unveils the theme of the DPV.

3.3 Experiment

To attain the second objective and test the other two hypotheses, an experiment is conducted in a computer laboratory with 30 undergraduate students studying at a Central European private university. Students were recruited using a convenience sampling approach, denoting the limited generalizability of the findings. Experimenters were firstly asked to fill in a questionnaire with a total of 33 questions (Survey1). Twenty-eight questions measure respondents' perceived image of Macau, and four questions measure their behavioural intention to visit Macau (adapted from Shani et al. 2010) on a 7-point Likert scale (1: Strongly disagree; 7: Strongly agree). The last question is to examine if the respondent has visited Macau before. Four postgraduate students were invited to review and verify the accuracy as

well as content validity of the questionnaire. After finishing Survey1, the selected DPV was then shown. Right after watching the DPV, experimenters were asked to fill in another questionnaire with 32 questions (Survey2) including the questions on the perceived image and visit intention but excluding the question on pre-visit. The sequence of questions was randomized to avoid order effect.

3.4 Data Analysis

To test the first hypothesis (i.e., the frequency of "gaming" (in the "Tourist leisure and recreation" category) related scenes in the analysed DPV is lower than that of any other destination attributes in the "Culture, history and art" category), descriptive statistics of all image categories and attributes were computed. To test the other hypotheses regarding the viewers' destination image change, a set of paired sample t-tests were conducted. By means of comparing the ratings in the same questionnaire items made before (from Survey1) and after watching the DPV (from Survey2), evidence if repeating can trigger the positive change in DPV viewers' image towards the promoted destination can be found.

4 Findings

Table 1 exhibits the frequency of the primary image categories and secondary image attributes identified from the video content analysis (Fig. 1 exhibits the timeline of when each attribute was shown in the video). Fourteen fragments were not included for analysis as both investigators could not classify them into appropriate categories and attributes. Among all 166 fragments which were successfully identified and classified, 45.2% (n = 75) of them are related to "Culture, history and art". This is similar to the findings in Hsu and Song's (2013) study, and this verifies that Macau's tourism authority is in line with the goal of showcasing and publicizing the cultural facet of their destination in their destination marketing program. "Atmosphere of the place" ranks second (n = 44, 26.5%). One possible reason is that most shots of the video show the smiling faces of characters and joyful experience during their visit. Regarding the secondary image attributes, it is surprising that no shot about "gaming" or "casino" was identified in the studied video. Conversely, shots relating to "Festivals and concerts" (n = 24, 14.5%) as well as "Entertainment and sports activities" (n = 23, 13.9%) dominate one fourth of the video duration. Besides "Festivals and concerts", all image attributes in the "Culture, history and art" category received four or above instances (except "Handicraft"). Given that the analysed DPV showcases more culture- or history-related image attributes than "gaming", the findings corroborate with H1 and confirm that Macau's tourism authority has been attempting to focus on the cultural facet and cultural heritage on their promotion program.

Table 1 Frequencies of all primary image categories and secondary image attributes appearing in the video

Primary image categories (N = 166)	Freq.	%
(1) Culture, history and art	75	45.2
(2) Atmosphere of the place	44	26.5
(3) Tourist leisure and recreation	23	13.9
(4) General Infrastructure	12	7.2
(5) Natural environment	8	4.8
(6) Social environment	2	1.2
(7) Tourist infrastructure	2	1.2
(8) Natural resources	0	0.0
Secondary image attributes (N = 166)	Freq.	%
Festivals and concerts [in *(1)*]	24	14.5
Entertainment and sports activities [in *(3)*]	23	13.9
Gastronomy [in *(3)*]	20	12
Fun, enjoyable [in *(2)*]	20	12
Museums, historical buildings and monuments [in *(1)*]	10	6
Folklore [in *(1)*]	10	6
Pleasant [in *(2)*]	10	6

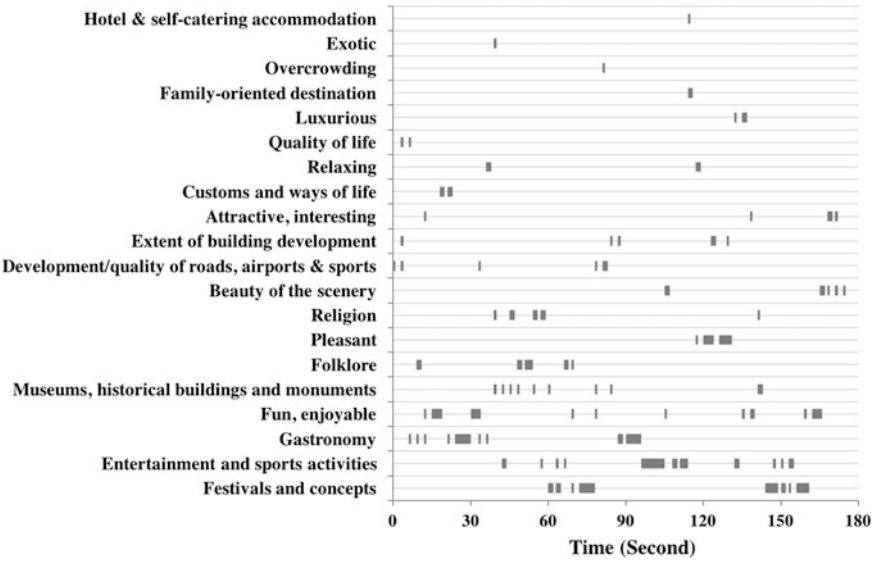

Fig. 1 Timeline of all secondary destination image attributes appearing in the video

Table 2 Paired sample t-test results

Macau …	BW	AW	*t*
(di1) Has a relaxing atmosphere	5.10	5.57	1.756
(di2) Has a clean environment	4.43	4.47	−0.128
(di3) Has a pleasant weather	4.83	4.80	0.254
(di4) Is welcoming	5.40	5.93	−4.287**
(di5) Has an advanced tourism industry	5.30	6.20	−5.835**
(di6) Is safe	4.60	4.57	0.215
(di7) Has an exotic oriental atmosphere	5.37	5.43	−0.403
(di8) Has various unique Chinese events and festivals	5.07	5.60	−3.764**
(di9) Has great nightlife and entertainment	5.93	6.30	−1.943
(di10) Is modern	4.80	5.50	−2.971**
(di11) Has suitable accommodations	5.93	6.03	−0.593
(di12) Has unique natural attractions	4.50	4.80	−1.557
(di13) Having a trip to Macau is absolutely worth telling	4.97	5.83	−5.277**
(di14) Has various recreational opportunities	5.30	5.90	−2.473*
(di15) Has friendly people	5.47	5.43	0.273
(di6) Has adequate tourism infrastructure (e.g., airport)	4.47	4.97	−2.096*
(di17) Has appealing local food and beverage	6.03	6.77	−3.958**
(di18) Is easily accessible	5.13	5.37	−1.882
(di19) Has convenient local transportation system	4.80	4.50	0.975
(di20) Has great shopping opportunities	5.10	6.00	−3.885**
(di21) Has diverse and unique ethnic groups and cultures	4.63	5.83	−7.761**
(di22) Is socially and politically stable	4.67	4.77	−1.140
(di23) Has unique historic and cultural attractions	5.37	5.70	−2.567*
(di24) Having a trip to Macau is value for money	4.83	4.77	0.229
(di25) Has a major sports power	3.37	4.93	−4.944**
(di26) Having a trip to Macau is inexpensive	4.55	4.21	1.263
(di27) Is high tech	4.30	4.93	−2.567*
(di28) Is heavily populated	3.67	4.17	−2.347*
(bi1) I am familiar with Macau as a travel destination	3.77	4.17	−2.112*
(bi2) I desire to visit Macau as a travel destination in the future	4.97	6.00	−6.360**
(bi3) I am likely to visit Macau as a travel destination in the future	5.20	5.77	−2.984**
(bi4) I am interested in getting more information about Macau	4.77	5.73	−5.298**

Remarks BW represents mean score rated before watching; *AW* represents mean score rated after watching; *represents $p < 0.05$; **represents $p < 0.01$

Table 2 exhibits paired sample t-test results. Among those 28 items measuring Macau's destination image, the mean scores of post-watching ratings on 14 items were significantly higher than those of pre-watching ratings. Similarly, the mean scores of post-watching ratings on four behavioural intention questions were significantly higher than those of pre-watching ratings. This implies that presenting the

DPV to the audience is an effective way to enhance destination image and to trigger viewer interest in researching and visiting the destination.

To test if the impact of DPVs on viewers' destination image and behavioural intention change varies between repeat visitors and non-visitors (i.e., H2), two additional sets of paired sample t-tests were conducted with 15 non-visitors and another 15 repeat visitors individually. As shown in Table 3, non-visitors rated 14 image items and three behavioural-intention items higher after watching the DPV. For repeat visitors, only six image items and two behavioural-intention items were found to be rated higher after watching the DPV. Furthermore, the positive mean differences of those significantly different items by non-visitors were generally higher than those rated by repeat visitors. This demonstrates that DPV is more salient in improving non-visitors' destination image and behavioural intention.

The final contingency table, Table 4, combines the frequencies of all image attributes extracted from the DPV and the mean differences of relevant attributes rated by respondents in the experiment. As shown in Table 4, for the top four most frequently shown destination image attributes in the studied DPV, viewers' ratings toward the corresponding image attribute were significantly increased after viewing the studied DPV. To those three attributes with the second highest level of appearance (i.e., Freq. = 10), viewers' ratings toward two attributes were significantly also increased after viewing the studied DPV. Yet, to other attributes which were not frequently shown in the studied DPV (i.e., Freq. < 10), viewers' ratings

Table 3 Paired sample t-test results by respondent types

Macau …	NV	RV
(di4) Is welcoming	+0.47	+0.60
(di5) Has an advanced tourism industry	+1.33	+0.47
(di8) Has various unique Chinese events and festivals	+0.53	+0.53
(di9) Has great nightlife and entertainment	+0.80	n.s.
(di10) Is modern	+1.13	n.s.
(di12) Has unique natural attractions	+0.73	n.s.
(di13) Having a trip to Macau is absolutely worth telling	+0.93	+0.80
(di14) Has various recreational opportunities	+0.73	n.s.
(di17) Has appealing local food and beverage	+1.07	n.s.
(di20) Has great shopping opportunities	+1.27	n.s.
(di21) Has diverse and unique ethnic groups and cultures	+1.20	+1.20
(di23) Has unique historic and cultural attractions	+0.67	n.s.
(di25) Has a major sports power	+2.20	+0.93
(di27) Is high tech	+1.33	n.s.
(bi2) I desire to visit Macau as a travel destination in the future	+1.00	+1.07
(bi3) I am likely to visit Macau as a travel destination in the future	+0.73	n.s.
(bi4) I am interested in getting more information about Macau	+1.07	+0.87

Remarks NV represents difference in mean scores rated before and after watching by non-visitors; *RV* represents difference in mean scores rated before and after watching by repeat visitors; *n.s.* represents no significant difference

Table 4 Contingency table with frequencies of all secondary image attributes and the mean differences of relevant attributes rated by respondents

Secondary attribute (N = 166)	Freq.	Diff.	Item
Festivals and concerts	24	+0.53	(di8)
Entertainment and sports activities	23	+0.60	(di14)
Gastronomy	20	+0.73	(di17)
Fun, enjoyable	20	+0.87	(di13)
Museums, historical buildings and monuments	10	+0.33	(di23)
Folklore	10	+1.20	(di21)
Pleasant	10	–	–
Religion	8	–	–
Beauty of the scenery	7	n.s.	(di12)
Development of roads, airports and sports	6	–	–
Extent of building development	6	–	–
Attractive, interesting	5	–	–
Customs and way of life	4	–	–
Relaxing	4	n.s.	(di1)
Quality of life	2	–	–
Luxurious	2	–	–
Family-oriented destination	2	–	–
Overcrowding	1	+0.50	(di28)
Exotic	1	n.s.	(di7)
Hotel and self-catering accommodation	1	n.s.	(di11)

toward them were not significantly increased after viewing the studied DPV. This empirical evidence partially supports that difference in viewers' rating on image attributes before and after viewing is moderated by the frequency of exposure to those attributes in the DPV.

5 Conclusions and Implications

Informative promotion providing potential tourists with knowledge of a destination has long been regarded as a significant factor influencing viewers' destination image formation as well as destination selection process (Fakeye & Crompton, 1991). Though DPVs have been extensively leveraged by DMOs in destination promotion since they are controllable by DMOs and they are powerful marketing tools enabling DMOs to communicate a variety of images in a compressed format, the effectiveness and influence of DPVs however has been scarcely investigated. Being one of the limited academic literature focusing on DPVs, the current research findings contribute to the emerging body of destination image literature by unveiling the efficacy of DPVs in influencing viewer's image of a destination.

Through contrasting the pre-watching and post-watching ratings, presenting DPVs to the audience is found to be efficacious in enhancing destination image and triggering interest in researching and visiting the destination. The additional analysis also shows this approach is particularly persuasive for non-visitors since they form an image of a destination based on the message conveyed by media, less mediated by prior experience. The practical implication is significant as the results do not only demonstrate the value and potential of DPVs as a medium for destination promotion, but also denote that DPVs should be positively considered and employed by destination marketers (Alvarez & Campo, 2011).

Providing empirical evidence to confirm the efficacy of repeating—a framing strategy introduced by Entman (1991)—in influencing DPV viewers' destination image change is another contribution of this study. By means of associating the video content analysis result with ratings given by viewers before and after watching the DPV, the current research findings demonstrate that consumers' image attributes as well as travel motives can be activated via increasing the appearance of the corresponding scenes in the video. Previous research (e.g., Alvarez & Campo, 2011; Shani et al., 2010) do provide a positive answer to the question of "whether DPVs influence viewers' destination image?". The current study is deemed to complement previous works by giving an answer to the question of "how DPVs influence viewers' destination image?".

In spite of its significant implications and contribution, this study clearly has shortcomings that readers should be cautious of when they interpret the findings. First, there is a need for future research using more and broader samples that include other age groups, since the current findings are based on the viewpoints of 30 undergraduate students studying at one Central European university. Second, the experiment in this study was conducted in a computer laboratory but other contextual features (e.g., screen resolution of viewing devices, opinions made by companions while watching) that are prevalent in real life situations might moderate the impact of DPVs on viewers' assessment. Hence, replicating and conducting the experiment in a more natural setting is advised and believed to be a critical step to validate the current research findings.

As the Internet and social media provide consumers with an efficient vehicle for sharing destination-related information among each other, the diffusion of destination-related information is no longer completely controlled by tourism service providers whereas consumer-generated content are expected to have greater influence on consumers' decision making (Tussyadiah & Fesenmaier, 2009). As such, examining the influence of consumer-generated videos on perceived destination image change is another direction for future research. Last but not the least, the current research idea is formulated based on the assumption that an individual would change their cognitive and conative beliefs after being exposed to the stimuli (i.e., DPV). Future researchers are highly advised to investigate whether this assumption is over-optimistic via analysing the underlying mechanism leading to the attitudinal and behavioural change.

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The Impact of IT-Enabled Customer Experience Management on Service Perceptions and Performance

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Abstract While information systems have been a catalyst for strategy in the hospitality industry for almost three decades, Customer Experience Management (CEM) has received substantial research attention as of late. CEM calls for the transformation of customer interactions, enabling an unprecedented scale and scope of service personalization. Such a transformation is theorized to benefit hospitality firms through increased service perceptions and loyalty. The work empirically addresses these questions by evaluating an IT-enabled CEM strategy in seven hotels. The work provides three contributions: first, it shows that IT-enabled CEM significantly increases customer preference elicitation during the service personalization process. Second, it demonstrates that tailored customer experiences translate into higher customer service evaluations and comfort perceptions of the hotels. Third, it shows that IT-enabled CEM improves disintermediation from high-cost distribution channels to low-cost direct channels.

Keywords Customer experience management · Service personalization · IT-enabled customer service systems

1 Introduction

Information Systems (IS) have had a dramatic impact on the hospitality industry in the last few decades (Law, Leung, Au, & Lee 2013; Piccoli & Ott, 2014). The effective use of technology to manage and personalize customer experience is expected to be a major brand differentiator in the hospitality industry (Talwar,

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2012). As a consequence, firms are increasingly using IT to provide high quality and personalized service (Buhalis & Law, 2008), with IT being at the core of a hospitality organisation's competitive profile (Zamani, 2016). These technology advances have enabled the emergence of a holistic approach to managing service encounters in the industry, namely, Customer Experience Management (CEM).

Despite the importance of CEM in the hospitality and tourism industry, many studies remain conceptual and there is a need for further empirical investigation (Hwang & Seo, 2016). However, past studies on personalization in the industry focus on extracting and delivering personalized information to users (Kim & Mattila, 2011), exploring personalization as one of the factors affecting hotel services and hospitality (Ariffin & Maghzi, 2012) or the dilemma between personalization and privacy (Morosan & DeFranco, 2015). There is little empirical research to date that investigates the use of IT in service personalization and delivery fulfilment as part of an overall CEM initiative (Xu, Benbasat, & Cenfetelli, 2014).

Personalization, the ability to tailor products, services, and the transactional environment to individual customers' needs, is a general process. A Customer Service System (CSS) empowers the firm to predict and identify customer needs (Chatzipanagiotou & Coritos, 2010) and to react to their requests promptly and effectively, thus allowing providers to personalize service delivery (Tan, Benbasat, & Cenfetelli, 2013).

Given the strategic significance of service and personalization to the hospitality industry, and the widespread use of IT-enabled CSS, it is important to investigate the role of technology in service personalization (Lui & Piccoli, 2016).

The objectives of the study is to empirically evaluate the immediate impact of IT-enabled CEM on preference elicitation and its distal effects on customers' satisfaction and hotel performance. It extends research on IT-enabled service personalization by showing how the use of technology as part of a CEM initiative leads to greater preference elicitation. It then empirically demonstrates how tailored customer experiences increase customer satisfaction. Finally, it shows how superior satisfaction translates into financial benefits by way of disintermediation and share shift from costly intermediated travel agencies to inexpensive direct distribution channels.

2 Theoretical Framework

Digital technologies have been transforming customer service since their widespread adoption in business organisations in the 1970s and 80s. The emerge of the public Internet accelerates this trend (Piccoli, Spalding, & Ives, 2001) and nowadays IT-enabled CSS represents a critical resource for hospitality firms (Piccoli & Lui, 2014), which is the collection of information systems that mediate and enable the delivery of service experiences with the objective of increasing overall customer value (Piccoli, Brohman, Watson, & Parasuraman, 2004).

Service experiences represent "the outcomes of the interactions between organisations, related systems/processes, service employees and customers (Bitner, Faranda, Hubbert, & Zeithalm, 1997, p. 193)." Such interactions occur through touch-points, defined as "any place at which a company seeks to manage a relationship with a customer, whether through people, technology, or some combination of both" (Rayport & Jaworski, 2005, p. 49). The recent interdisciplinary literature on IT-enabled customer value creation and service experience has coalesced around the notion of Customer Experience Management (CEM). Gartner defines CEM as "the practice of designing and reacting to customer interactions to meet or exceed customer expectations and, thus, increase customer satisfaction, loyalty and advocacy" (Gartner n.d.). The scholarly literature echoes this definition by referring to CEM as "the process of strategically managing a customer's entire experience with a product or a company" (Schmitt, 2003, p. 17). Within the hotel industry, by enabling tailored experiences and service personalization, CEM is increasingly seen as a vehicle for differentiation and strategic advantages (Palmer, 2010). Specifically, the literature posits how CEM initiatives lead to value equity (i.e., customer satisfaction), brand equity (i.e., brand image), and retention equity (i.e., increased loyalty) (Rust & Oliver, 2000). However, empirical validation of these claims is limited.

Service personalization is the process of using individuals' own information to tailor the service and improve the benefits delivered to them (Lee & Cranage, 2011). In the context of service personalization, IT can be deployed to enable preference elicitation and personalization fulfilment. The property of a technology design that communicates, implicitly or explicitly, available behaviour to a user is called a signifier (Norman, 2013). Signifiers are important to ensure that options provided to guests don't remain latent, but are in fact recognized, helping to reduce the high cognitive burden and difficulties in making choices during personalization (Broniarczyk & Griffin, 2014). Customers may not be aware of, or clear about, their own preferences for personalized service thus failing to make requests that would ultimately improve their experience (Padmanabhan, Zheng, & Kimbrough, 2001). A CEM initiative that supports preference elicitation will instead result in enhanced customers' awareness of personalization options, ensuring that those who are interested in personalizing their experience are more likely to communicate their requests to the firm.

Hypothesis 1a Use of IT-enabled CEM increases the intensity of preference elicitation.

Hypothesis 1b Use of IT-enabled CEM increases the frequency of service personalization.

Service quality theory predicts that individuals that better specify their service requirements experience a narrowing of the expectation-delivery gap with a subsequent improvement in perceived satisfaction (Ho & Zheng, 2004). A CEM initiative that elicits appropriate customer preferences will lead to higher perceived service quality and comfort ratings (Murthi & Sarkar, 2003). That is, a proactive

service personalization effort through CEM makes available the benefits of personalization to individuals who were unable to experience it before.

Hypothesis 2a IT-enabled service personalization increases service ratings.

Hypothesis 2b IT-enabled service personalization increases comfort ratings.

Through an IT-enabled CEM strategy, an organisation can develop an electronic relationship (O'Toole, 2003) with those individuals that adopt the service personalization process and finally reaching higher levels of loyalty. Service personalization indeed increases perceived service quality, customer satisfaction, customer trust and ultimately customer loyalty toward the firm (Coelho & Henseler, 2012). Customers' perception of participation and firm's responsiveness when engaging in a personalized service process can lead to a long-term relationship with the firm (Lee, Hu, Cheng, & Hsieh, 2012) and provide economic benefits through disintermediation (Sheth & Sharma, 2005; Buhalis & Law, 2008). In the hotel industry, a direct reservation corresponds to a substantially higher profit margin than intermediated reservations due to the saving on the commission paid to a third party online travel agency. Thus, fostering disintermediation from high-cost distribution channels to low-cost direct ones is an imperative for hospitality firms. Considering how personalization induces affective attachment and customer commitment to stay with the website (Fung, 2008), it follows that service personalization through CEM initiatives should contribute to shifting transactions to the direct channel.

Hypothesis 3a IT-enabled CEM result in increased disintermediation.

3 Methodology

3.1 Context

This study uses an archival research methodology in the context of 7 independent Swiss three- and four-star hotels. The properties belong to the Swiss Quality Hotels International (SQHI) chain and represent a range of sizes (45–106 rooms), segment focus (leisure and business) and locations (city and resort). SQHI, a believer in the value of IT-enabled CEM as a competitive lever, partnered with Innotour, a Swiss association focused on the improvement of competitiveness of Swiss tourism. Hotels applied for the project on a voluntary base, implementing a CEM work system, called Hoxell, which enables a deep interaction between guests and hotel staff at multiple touch points in the customer experience—including pre-arrival, occupancy and post-departure. A key element of the Hoxell system is the service personalization process, enabled by a dedicated module called MyPage. When guests receive a reservation confirmation, they are directed to a personal page (i.e., MyPage) where they can select different options for personalizing their hotel stay. The SQHI hotels in the study provided a range of personalization items (from 52 to 133) — from preferred room temperature to pillow and bedding types, to drink and

touristic amenities. The preferences are laid out by categories with images and restrictions, thus serving as signifiers and making guests aware of the specific possibilities to customize their experience. Transmitting stored preferences to service personnel on the date of the guest's arrival via an iPad, available to all housekeepers during the shift, ensures personalization delivery.

3.2 Data

Through MyPage as well as via traditional means (e.g., in person, phone call), at any time between placing a reservation and checking-out, guests can request any product or service that will make their experience more pleasant. When requests are received via traditional means, such as via phone or reception desk, hotel staff annotates them in a specific field of the Property Management System (PMS), referred to as traces.

The dataset is comprised of 104,465 reservations, with related information about guests' profiles and personalization requests, beginning one year prior to the implementation of the IT-enabled CEM initiative. Hypotheses 1 is tested with data on stays whether personalized through virtual means (i.e., MyPage), traditional means (e.g., phone) or not requesting personalization.

Hypotheses 2 are tested by matching reservations with online review scores from Booking.com and retaining the ratings of services and comfort. Two hotels were dropped from this analysis. The first one had internal policy restrictions resulting in more than 80% of requests not being delivered. The other had a small number of reviews on Booking.com, thus resulting in no personalized reservations having a corresponding review.

To test Hypothesis 3, the proportion of guests who move from intermediated channels on their first visit to a direct channel on their second visit (positive share-shift) is used.

3.3 Measures

Preference elicitation has been operationalized (a) as the number of personalization items that customers requested for service personalization; and (b) as the number of personalizing reservations, including the number of instances where individuals engaged in the personalization process via traditional means as well as MyPage once the system became available. Review ratings are collected from Booking.com, where only verified guests are allowed to share their perceptions about service aspects. These are assessed on a four-point ordinal scale with anchors "poor," "fair," "good," and "excellent", and then converted into a quantitative scale: 2.5, 5.0, 7.5, and 10. This data have been directly linked to reservation data stored in the Hoxell system, allowing for individual guests' analysis. Booking channel is

investigated through classification of reservations among ones related to (a) direct channels (i.e., hotels' webpages, call, walk-in, or a partner national association), (b) indirect channels (i.e., OTAs, tour operators, GDS). Controls for ADR, length of stay in days (LOS), price paid for personalized items, number of adults and children on the reservations are used for H2. Controls for ADR, number of adults and children are used for H3.

4 Results

Hypothesis 1a is tested using 5,143 reservations of guests who personalized their stays (2,219 through MyPage and 2,924 via traditional means), and the data include service personalization channel as the independent variable and the number of items requested as the dependent one. The number of items requested is modelled via a Poisson regression with a log link. A value of 1 for the dependent dummy variable indicates service personalization requested through MyPage and 0 refers to the traditional personalization process. The results provide strong support for preference elicitation increase showing that, on average, guests request 1.05 items per stay when using the traditional personalization process (p-value < 0.01) and that the average number of items increases to 3.59 item per reservation when guests use MyPage (p-value < 0.01).

Hypothesis 1b is tested using the entire dataset of 104,465 reservations, estimating the proportion of guests engaging in service personalization with a binomial regression with a logit link. The dependent variable is represented by the number of personalized stays, while the independent variable is a dummy variable representing the actual choice of service personalization. The binomial regression models the possibility of guests' requesting personalization (i.e., the possibility of the independent dummy variable is equal to 1, where 1 indicates that the guest requested personalization via either the traditional channel or MyPage). The model controls for actual availability to the virtual channel, via a dummy variable coded as 1 for reservations occurring after the introduction of the IT-enabled service personalization process and 0 when the only available option was the traditional personalization process. The results provide strong support for preference elicitation increase, showing that the IT-enabled service personalization process generates an increase in number of personalized stays, and that the CEM initiative does not cannibalize the traditional personalization process.

Hypotheses 2a and 2b are tested using reservations for which there was a matching review posted to Booking.com. *Personalization* is a dummy independent variable, with 1 indicating personalization requested through MyPage and 0 representing the lack of request of personalization via the CSS. Due to the ordinal nature of the review scores, representing the dependent variables of the model, proportional odds regression models are used.

The results generally support the contention that an IT-enabled CEM initiative significantly improves ratings of service and comfort. Specifically, the odds ratios

for *Personalization* are 1.58 when measuring service ($p = 0.01$) and 1.69 when measuring comfort ($p = 0.03$). Thus, for each rating level in the scale, customers who experience IT-enabled service personalization have a 58% (and 69%) higher chance than their counterparts to give a higher service (and comfort) rating category.

Hypothesis 3a is tested using a sample of 1,611 guests who visited the same hotel more than once during the timeframe of the study with a binomial regression models with logit link. *Direct* is a dummy variable where 0 indicates the use of an intermediated channel and 1 indicates a reservation made through a direct channel. *Personalization* represents whether the guest used MyPage (1) or not (0) during the first visit (at time 0). The results show that IT-enabled service personalization increases beneficial share-shift ($p = 0.03$). Specifically, the odds of transacting using the direct booking channel in their next stay more than double for customers who experienced IT-enabled CEM in their first visit than for customers who did not.

5 Discussion

This study focuses on the effects of IT-enabled CEM. The first objective of the work is to validate the finding that IT can be used to improve preference elicitation from guests, as consequence of the lower effort of selecting preference items when using CEM tools instead of traditional means. The ability to tailor the guest experience, a prerequisite for effective CEM, is predicated on collecting customer preferences. Previous work shows how CSS that employs signifiers to support the learning phase of the service personalization process (Murthi & Sarkar, 2003) leads to an increase in both the number of guests who engage in personalization and the number of items they request (Piccoli & Lui, 2017). The study finds that, across the hotels in the sample, IT-enabled service personalization enables guests to tailor the experience by identifying appropriate items to personalize their stays. It ascribes the result to the reduced friction created by the online system as well as the presence of signifiers that direct guests' attention to the available options. This process is not feasible without IT, such as via phone, where guests end up only requesting critical personalization items, despite the best effort of the hotel to welcome personalization requests (Piccoli & Lui, 2017). More interestingly, not only the number of preferences increases, but their variety as well.

While those individuals who requested specific personalization using the traditional approach focus on items that are essential during their visits. (e.g., extra bed on 24% of cases, dedicated treatments for special occasions on 19% and kids amenities on 17%), when doing so via the MyPage individuals are empowered to express a more diverse set of preferences, including non-essential ones (drinks on 45% of cases, pillow type on 42% and bath amenities on 39%). The work also

corroborates CSS literature proposing that IT-enabled CEM enables the firm to foster direct relationships with customers (Becerra, Santaló, & Silva, 2013) and, as consequence, improves loyalty. More specifically, it finds that the hotels in the study achieved strong positive share-shift and were able to shift returning guests to the low cost direct channels. While these findings are stable and withstand replication, significant questions still remains. As guests move increasingly to the mobile as the platform of choice for interaction with firms (Tesoriero, Gallud, Lozano, & Penichet, 2014), how should the preference elicitation process be redesign? As conversational interfaces and natural language voice interfaces become increasingly common, how can hotels ensure that guests can easily customize their travel experiences?

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Key Factors in the Booking Activity Process: The Case of Self-catering in Valais Switzerland

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Abstract One of the most important phases in planning a vacation is the booking activity process. The aim of this research is to study if the country of origin and/or seasonality has a link with the booking period (BP). The data used is from the largest booking platform of self-catering accommodations in the region of the Romand Valais in Switzerland. The data set contains more than 141,000 transactions from 1st January 2010 to 26 December 2016. This research uses the Kaplan-Meier (KM) survival method for modelling the length of BP after the resampling process. Seasonality of travel shows a higher discrimination level on BP than country of origin. This demonstrates that the importance of socio-demographical factors have been over-estimated against other factors such as travel motivations that may include external constraints such as school holiday timing. For practitioners, the results shed some light on planning behaviour across different markets and seasons. For scholars, beside methodological issues, the results show that countries of origin are less relevant than seasonality in the characterisation of the planning vacation process (PVP).

Keywords Planning trip · Big data · Survival methods · Kaplan-Meier survival function

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1 Introduction

The intangible nature of tourism services underlines the importance of the decision process both for the service providers and the potential customers (Bieger & Laesser, 2001, p. 142; Caroll & Siguaw, 2003; Hyde & Laesser, 2009; Werthner & Klein, 1999). The internet has increased interest in the planning vacation process (PVP) comprised of the tourist, the interface and the online space (Pan & Fesenmaier, 2006). Online sales of travel and hospitality products linking vacationers directly to service providers without intermediation has challenged the traditional structure of vacation models (Hyde & Laesser, 2009).

For the purpose of this paper, the concept of planning the vacation process is the set of decisions that the vacationer takes prior to departure. PVP is a decision-making process handling multi-faced and interrelated decisions that last more than one day (Woodside & MacDonald, 1994). It is an on-going process having different phases that are not completed once the booking process has been completed (Decrop & Snelders, 2004). The different phases are ordered in a temporal sequence which can overlap, have feedback loops (Dellaert, Ettema, & Lindh, 1998; Rashidi & Koo, 2016), or be part of a cascading process (Jeng & Fesenmaier, 2002).

The aim of this research is to study the booking period across countries and seasons using online self-catering platform data for a Swiss region, the Romand Valais.

The paper is organized in the following way: the literature review discusses the empirical evidence on the relevance of motivations and information-collection in the PVP along with other traditional factors including socio-professional and economic standing (Bieger & Laesser, 2000; Boztug, Babakhani, Laesser, & Dolnicar, 2015; Laesser & Zehrer, 2012). PVP models will be evaluated, with the literature review concluding with a discussion of the Kaplan-Meier survival function and its limitations in tourism studies. The second section discusses the research question. The third section contains the description of the data and methodology chosen in order to apply the KM method to big data. The fourth section analyses the results. The final section discusses the results in terms of scientific and management dimensions and implications for future research.

2 Literature Review

2.1 Planning Vacation Process

A macro-level analysis of online PVP identifies needs, determinants, antecedents and outcomes involved in the process. It also includes the usage of the sources in terms of degree and directions in the online searching process (Pan & Yang, 2016; Vogt & Fesenmaier, 1998). There are two most frequently cited models for PVP. The first model consists of three-stages: need recognition, search for destination, and evaluation of destination-related choices (Moutinho, 1987). The second

has five stages: general decision, information acquisition, decision-making, activities and evaluation (van Raaij & Francken, 1984; Vogt & Fesenmaier, 1998). In the PVP, the importance of information sources changes or shifts depending on the phases of the decision process. Bieger and Laesser (2004) presented a three stages model inspired by early scholars' works (Correia, 2002; Leiper, 1990) where the central or second stage is the *trip decision*. At the moment of the trip decision the choice is almost irreversible with regard to the destination, accommodation or the package of chosen activities. The other two remaining stages are characterised by the sources of information processed; in the first, pre-decision stage, information is about the decision making for deciding the key characteristic of the trip. In the third, post-decision stage, information is about further preparation of the travel after the constraining decision.

Tourism travel choices are of a multi-faceted nature, given that the elements of the final choices are interrelated and sequenced over time in the PVP (Dellaert et al., 1998; Rashidi & Koo, 2016). Therefore, PVP as a decision process has two different dimensions: a structural constraint limiting the choice (for example vacation periods are determined by school calendars) and the sequence or temporal dimension (Dellaert et al., 1998). The importance of the temporal dimensions of PVP was shown in an exploratory methodology (Woodside & MacDonald, 1994) whereby a single trip could be spread over time. Evidently these results should be considered with some scepticism due to the quantum increase of online searching tools since the advent of the Internet (Hyde & Laesser, 2009).

Nevertheless, given the interrelation of elements involved in the PVP, a time component seems to be always present independently of the evolution of online tools. Empirical evidence based on survey methodology by Dellaert et al. (1998) suggest a conceptual framework for PVP timing. The span of time between each choice and the actual travel date are listed by time sequence order: (1) the choice of destination, on average 7.17 months (2) travel companions, 6.20 months (3) accommodation, 5.58 months (4) length of the trip, 5.57 months (5) bookings, 3.81 months.

One of the criticisms of this data is that they are gathered based on the memory recall of past activity of the respondents. The study also suggests that other dimension of exogenous constraints could influence the frame pattern; besides the availability of travel options or financial resources, institutional constraints such as the holiday school period may also be important. Travel behaviour, therefore, could differ between travellers with or without children. A very extensive literature review of these models may be found in Sirakaya and Woodside (2005).

There are a number of research studies focused on the relevant exogenous variables *shaping* travel plans that help in deciding market segmentation. The predictive power of information collection was found to be relevant for travellers' preferences and less relevant for the final travel choice (Decrop & Snelders, 2004). Empirical analysis on a large and rich set of data of Swiss residents shows that socio-economic factors are less relevant than travel situation (type of trip, attraction of a destination, number of participants) and motivation structure in market segmentation analysis (unemotional solo travel, cultural hedonism, family oriented,

and package tour travellers) (Bieger & Laesser, 2000). A more recent empirical study confirms the latter results using similar data as in earlier studies, but gathered in 2011/2102 (Boztug et al., 2015).

The results show the difficulty in predicting behaviours for some "hybrid tourists" based on their past experiences. Hybrid tourists are travellers whose next trip segment affiliation cannot be predicted by the last segment they were clustered even if segmentation is made on a motivational or expenditure basis. Moreover, the authors highlighted that the hybrid tourists are not the exception but the norm; only a quarter of the participants in the sample belong to the same motivation segment across more than one trip. Personal traits seem, however, to be associated with travellers' hybridity propensity (Laesser & Zehrer, 2012).

Traditional macro-level empirical research assumes that the vacationer is traveling to a single destination, but the growing online offer has challenged this approach, especially in relation to the degree of flexibility in the vacation itinerary and the increased number of independent travellers versus package travel (Hyde & Laesser, 2009, p. 242).

In a study of Swiss residents travel behaviour Hyde and Laesser (2009) individualized three typical behaviour patterns: "stay-put", "arranging", and "freewheeling" touring vacations. In the first case, "stay-put", this is very close to the traditional concept of a single destination vacation; the second, the "arranging" touring consists of a visit of several destinations with overnights in multiple locations that could be self-arranged by the traveller themselves prior to the departure; finally, the "freewheeling" vacationer has pre-arranged only a few places of accommodation and has a high flexibility and spontaneous choice of vacation elements. These three patterns show different choices and timing of the macro-level frame such as travel routes and accommodation. Moreover, the increasing flexibility during travel allows the selection of secondary destinations that were not planned prior to the departure.

The present research focused on the booking timing period (BP) that is the span of time or duration between the booking of the accommodation and the actual travel date. This concept is in line with Dellaert et al. (1998) although it is noted that they distinguish between the accommodation choice momentum and the actual booking.

Scholars inspired by Leiper (1990) classified the attraction in the PVP taking into account the time that the visitor decides to expend on each of them once they decide the destination. Therefore, this classification states as *primary* and *secondary* attractions those whose length of visit can be evaluated. *Tertiary* attractions are those which the visitors are not aware of their existence when they made the destination decision (Botti, Peypoch, & Solonandrasana, 2008). Viewed through this optic, the BP has some relevance for practitioners because during the BP *tertiary* attractions such as those in the local vicinity, other entertainment choices, and restaurants can be more accurately advertised

In revenue management studies the actual travel date is termed "booking horizons" and the BP would be the period between the booking date and such a horizon. In these models the estimation of cancelation rates (i.e. no show passengers or simply cancellations) becomes critical for an accurate dynamic pricing estimation

(Romero Morales & Wang, 2010). This study, however, does not have data on booking cancellations.

2.2 Survival Methods and Tourism Research

The use of survival models, also called "event-history analysis," "duration analysis" and "failure-time" has increased in popularity in tourism studies (Box-Steffensmeier & Jones, 1997; Thrane, 2012, 2015). Most of the studies use survival models in order to show the covariance between a dependent variable representing a duration (for example, length of stay, amount of spend in a destination) with other independent variables. Some examples of those regressors in the explanation of the length of stay could be the use of the "pre-fixed", and the "open" returner (Thrane, 2016). Various studies have found socio-demographic profiles to be relevant, for example motivation in golf tourism at Algarve (Barros, Butler, & Correia, 2010), summer tourism in Norway (Thrane & Farstad, 2012) and in tourism to Madeira (Barros & Machado, 2010). An extensive listing may be found in Thrane (2016, p. 180).

Survival methods are relevant for industrial analysis for business demographics on the analysis of entry and exits of the firm in markets. Some examples of this application are an analysis of the Spanish hotel industry (Gémar, Moniche, & Morales, 2016) and ski lift companies (Falk, 2013).

From a statistical point of view, BP denotes a variable t_i, which is the indicator of the time lapse between the booking and the actual travel date. By intuition, the probability that a booking arrives on the actual travel time increases as time goes by. Thus, BP is assumed to be the realization of a random process T, where T is the random variable measuring the arrival time or the booking horizon. For the BP cumulative distribution function we mean:

$$B(t) = \Pr(T > t) \tag{1}$$

In order to calculate this function a non-parametric estimator is used: Kaplan-Meier (KM) estimator which is one of "the most widely used in academic research" (Gémar et al., 2016, p. 431).

Let $t_1 < t_2 < \cdots < t_D$ represent the distinct event times; for each $i = 1, \ldots, D$; let n_i represent the number of bookings that have not yet reached the actual travel date and let d_i represent the number of bookings that have already reached it at t_i (cf. SAS Institute Inc., 2009, p. 3131). The KM estimators at t_i is this straight-forward equation:

$$\hat{B}(t_i) = \prod_{j=1}^{i} \left(1 - \frac{d_j}{n_j}\right) \tag{2}$$

In time $t_i = 0$, then $d_i = n_i$ and $B(0) = 0$. In survival methods, the function B is not the standard plot but the so called survival plot as in Eq. 3

$$P(T \leq t) = 1 - P(T > t) = 1 - B(t) \tag{3}$$

Figure 1 shows the plots of (3) corresponding to the BP of Swiss (CH) in High Winter (HW) and Low Summer (LS) season. If we fix the share of bookings that have not yet reached the actual travel date at 40% (line 0.4 in Fig. 1) for HW the BP is 135 days, whereas for LS it is only 37 days. Therefore, the BP of HW is longer than that for LS in the Swiss market up to the moment that the lines cross near 400 days.

The KM model is an appropriate model for the study. Firstly, on the one hand the goal of this study is the investigation of BP distribution functions across countries of origin and seasonality; on the other hand there is not any cancelation information (in terms of survival studies, no left censored observations) (Allison, 2010). An observation is described as right censored when there is a follow-up time but the event has not yet occurred, and left censored if it is not known to have occurred (Barros & Machado, 2010, p. 697).

Some precautions need to be taken into account when modelling with KM. KM is suitable if the number of data is not big (Allison, 2010) and the presence of estimates' bias have been detected not only with KM but also with other survival models (Boehmke, Morey, & Shannon, 2006). Random sampling is a solution of these latter problems. Another critical issue points out that the use of survival methods, especially with regressors, yield less accurate estimates than traditional methods such as ordinary least square regression (OLS) (Thrane, 2012).

One of the main issues of survival models is to decide when two survival functions are different across two groups or strata (Fig. 1). A nonparametric hypothesis test based on Wilcoxon statistics having as a null hypothesis that the two groups survival function are equal is one of the most used (Allison, 2010).

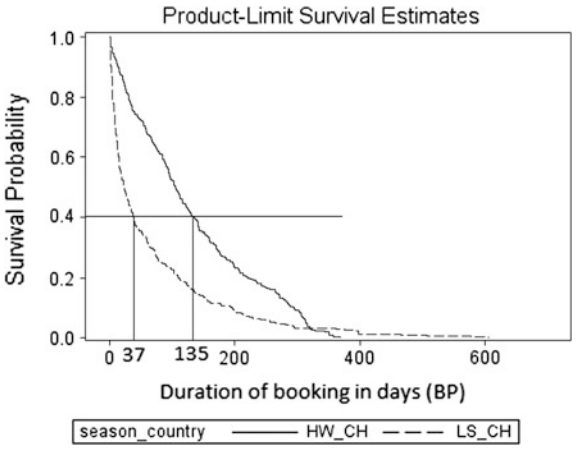

Fig. 1 Example of survival plot of BP. Percentage estimations of the bookings not having reached the actual travel date (y-axis) at time t (axis x)

3 Research Question

The literature review shows that the BP is a variable that sheds some light on the PVP. BP was defined in the last section as the span of time or duration between the booking of the accommodation and the actual travel date. In terms of the three-stage model by Bieger and Laesser (2004), BP is a part of the middle stage namely the *trip decision* and in this particular set of data under study, it is a proxy for the duration of the third and last stage: post-decision information. The choices of post-decision stages consist of how to spend the time at the destination or how to travel (if the decision had not been taken in the previous stages). The data used for the analysis comes from a cooperative called C.I.T.I. (*Coopérative informatique du Tourisme et de l'immobilier*). As C.I.T.I. has a very strict cancelation policy (see data description section) then the "trip booking" represented by the accommodation booking, could be considered as *irreversible.*

Therefore, the aim of this research is to show any links between the variable BP as the dependent variable and countries of origin and/or seasonal periods.

4 Data and Methodology

4.1 The C.I.T.I. Platform

C.I.T.I. was founded in 2003 with the goal of bringing specific IT services to its members. As of today, 46 real estate agencies (that control more than 6000 chalets or apartments) are part of this cooperative and provide real-time data to centralised data centres. Every Monday, booking data are sent to the tourism observatory of Valais who stores them in its data warehouse. The data set contains data about booking in the Canton for the next 6 months with information about the customers (number of people, country of origin, and if available, city of residence) and information about the object (location, number of beds and number of rooms). Variables of interest are the fields "booking date", "arrival date" (that is the actual travel date), and "country of origin". BP was calculated as the difference of "arrival date" and the "booking date" measured in days. The countries of origin outside of Europe were not taken into account because the share was too low when crossed with seasons. Figure 2 shows the distribution by 6 main countries retained across seasons. In total the data has 130,677 booking transactions. The period of time of the actual travel date is from 1st January 2010 to 26th December 2016. The transactions where the date is later than the moment this research is written could be considered as right-censored events. In actual fact, this is not completely correct, because censored means that the travel date is unknown and in this case it is just planned later.

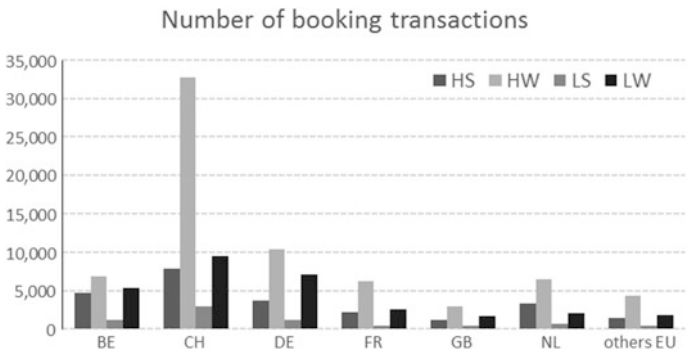

Fig. 2 Number of booking transactions per country and season

The cancelation conditions of C.I.T.I. are very strict, especially when compared to other online travel agencies and on-line accommodation providers such as Airbnb (C.I.T.I., 2001). In order to have a cancelation without charge, the time period has to be more than 89 days: between 89 and 29 days, a 50% payment is required and from 28 days 100% has to be paid. In the case of what C.I.T.I. calls "last minute bookings" where the BP is between 7–28 days, a free cancelation could be made 24–48 h before the date. In all cases of "free" cancellations, transaction fees will be levied.

The categorization of seasonal variables is: High Winter (HW): December, January and February; Low Winter (LW): November, March and April; High Summer: June, July and August and finally Low Summer (LS): May, September and October.

4.2 KM and Sampling Methods

The authors used SAS Institute 9.4 software and programmed a customized routine in order to produce and analyse 100-simulation analysis as follows: a first routine draws a random sample on the original data set (130,677 booking transactions) having 300 transactions of each combination of the 7 origin countries and 4 seasons, total 300 * 7 * 4 = 8,400 transactions. This routine uses the SAS routine *proc surveyselect*. Therefore for each combination country/season the number of transactions is 300, in order to avoid side effects and in line, Boehmke et al. (2006).

A second subroutine performs the estimations of KM (Eqs. 1–3) and yields the p-value for each pairwise comparisons of the Wilcoxon hypothesis test, in total 420 results. These estimations are carried out using the SAS routine *proc lifetest*. The estimates of the mean, median, and quartiles are also gathered using *proc sql*.

Once the 100 simulations analysis are finished, another subroutine yields the number of them (s) which its Wilcoxon test p-value is less or equal than 10% (slightly significant) for each combination of country and season (in total 420). For

each of the 420 combination *s* follows a binomial distribution whose parameters are the numbers of trials (simulation) n = 100 and estimate probability of success is *s/100*. Then the binomial 95% confidence interval was calculated and retained as different those countries/seasonal combinations having as lower limit at least 93%.

5 Results

Figure 3 shows the distributions of the median yields by the 100 simulations per origin country and order by panel seasons. An inspection of this figure shows that there are no perceptive differences across countries, with the exception in LW panel for BE and DE [Belgium and Deutschland (Germany)].

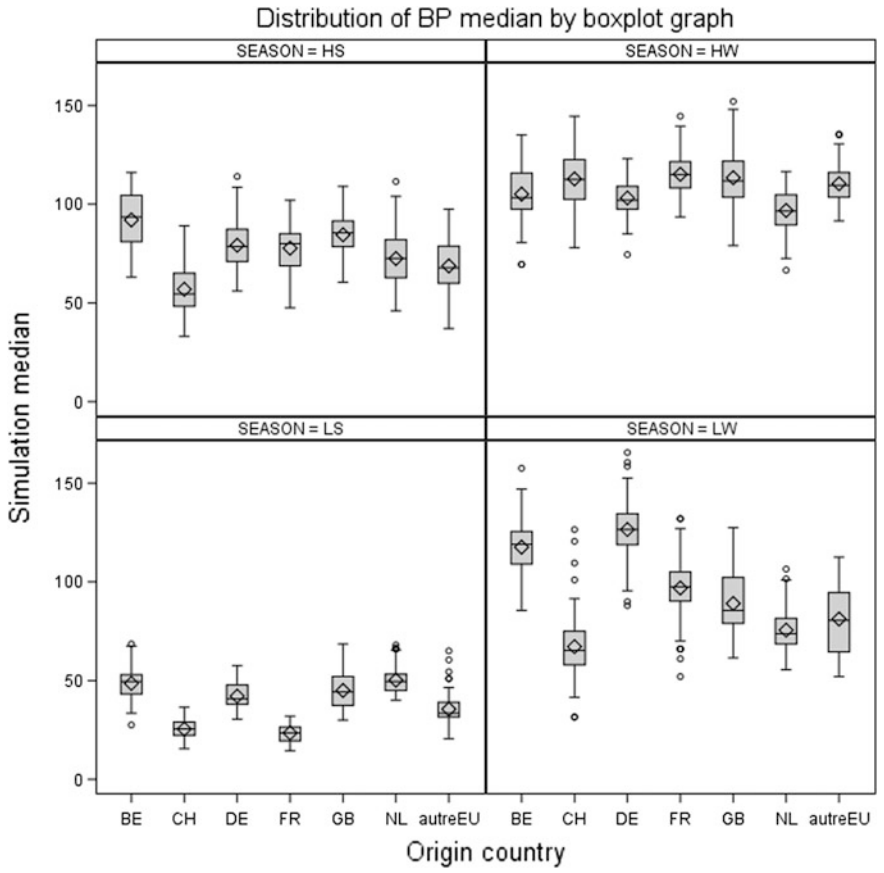

Fig. 3 Boxplot of the medians BP paired in 100 simulations per origin country and seasonal panels

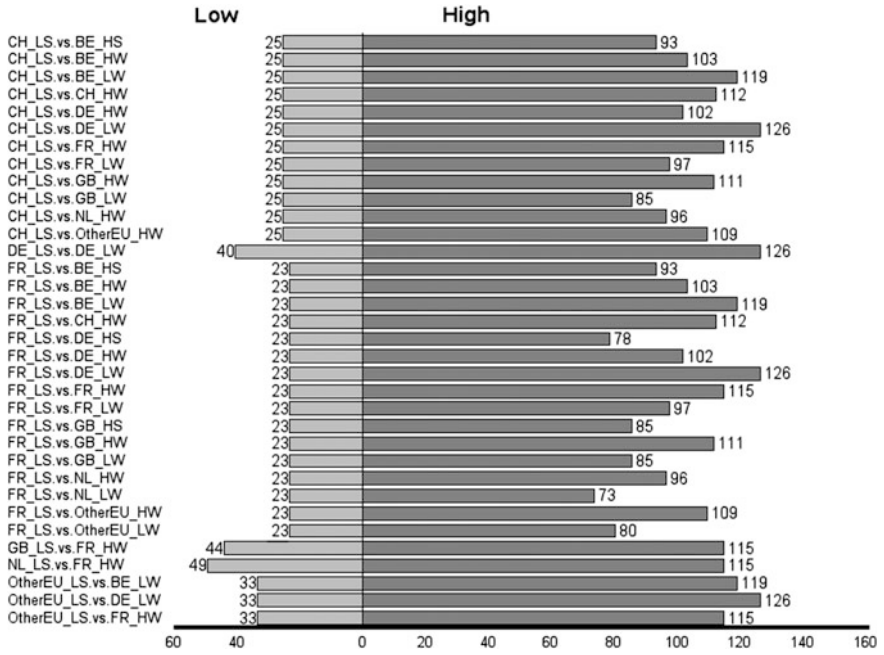

Fig. 4 Combination origin/seasonal pairs detected as having different survival curves, the bar graph shows the BP median. *Light grey bar* corresponds to first and low element of the pairwise

Figure 4 shows the confirmation of this explanation by presenting the pairwise origin/season whose survival curves are different. In order to illustrate the differences, the bar graph shows the BP median over the median of the 100 simulations. Thus, they indicate the median BP in number of days, namely the period of time at which half of the bookings have already reached the actual travel date. The pairs are increasingly ordered by the number of times that the pairs were significant (p-value 10%) to the Wilcoxon test (*s* in the last section). Besides the only case of the first pair (CH_LS vs. BE_HS), all the others oppose winter versus summer (whether it is Low or High Season). Another interesting feature is that besides the pairs CH_LS versus CH_HW, FR_LS versus FR_HW and FR_LS versus FR_LW, all others opposed different countries.

6 Conclusions

6.1 Managerial Conclusions

BP information sheds some light on the appropriate marketing strategy that may be used by tourism organizations such as timeliness depending on the country of origin and season.

The analysis of the BP across seasons shows that the cancelation policy will be more effective if this is more differentiated. The cancelation policy could be appropriate in High Winter but is not really appropriate and too restrictive for Low Summer. Alpine destinations are in competition with other destinations (classically the sand and sea type resorts) so this could prove to be a very important issue in customer's decision making process.

The main differences are between Low summer and High winter (Fig. 4) and are in line with Dellaert et al. (1998) who suggested that constraints such as school calendar holidays in winter (probably with the main motivation of ski activities) seems to affect the BP, making it longer than other seasons. Indeed, this High Winter market is more characterized as having "pre-fixed" length of stay whereas Low Summer could be classed as "open" returner behaviour (Thrane, 2016).

During the BP it is important for stakeholders in tertiary attractions (that may often be local) to be aware of the importance of advertising at this time.

6.2 Scientific Conclusions

The exploratory analysis on Fig. 3 confirms by the 100 simulations the Wilcoxon hypothesis test output higher relevance of season effect than country of origin. For any season, the results show no perceptible differences between countries. Moreover, the significant differences found in Fig. 4 are related with winter and summer that are closer to the travel motivation and motivation structure. This is in line with the findings of supporting a decline in the importance of the socio-demographics profiles, in this case the origin of country by Bieger and Laesser (2000) and Boztug et al. (2015).

The originality of this research is that the data consists of a panel based on actual behavioural patterns and not of cross-sectional questions based on recall activity of the respondents.

7 Limitations and Future Research

The type of accommodation under study is mainly chalets or apartments. This is a very specific type of accommodation that attracts specific types of publics (that may probably be interested in certain activities such as skiing, and especially family tourism). This study excludes other types of accommodation such as hotels (booking.com) or platforms such as Airbnb, that may behave completely differently. The tourist who books through C.I.T.I. may be a longer-stay tourist who probably needs to book more in advance.

This research shows a methodology appropriate to deal with a big data set by applying sampling techniques as the base of simulations. It is envisioned that future

research will take the form of testing of other independent variables such as the length of stay, the number of persons in the transaction, and the kind of accommodations (i.e. cabin, chalet, apartment etc.)

The aim is to complete a broader picture that could identify the main drivers within the PVP. This preliminary study supports that the type of trip and the motivations are relevant.

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Determinants of Customers' eWOM Behaviour—A System Success Perspective

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Abstract Consumers are both eWOM receivers as well as generators. Despite extant literatures on eWOM adoption and generation research, little research focused on eWOM communication from a system perspective. This research examined eWOM adoption and generation behaviour using the IS success approach by including three dimensions of quality perception of travel review websites, namely information quality, system quality, and social quality. The proposed research model is tested with empirical data from 204 respondents who have both used and generated eWOM. The findings indicate that, information quality (completeness), system quality (reliability), and social quality (social interaction) all exert significant effect on travellers' eWOM use behaviour. System quality (integration, reliability), and social quality (social presence, social interaction) are important predictors for travellers' eWOM generation behaviour.

Keywords IS success model · Social presence · Social interactivity · eWOM

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1 Introduction

The advancement of new communication media has generated different channels for information searching and feedbacks by individuals, such as social network sites, online review websites, virtual communities etc. The traditional word of mouth (WOM) is accordingly transformed into electronic word-of-mouth (eWOM), which is "positive or negative statement made by potential, actual, or former customers about a product or company" (Hennig-Thurau et al., 2004). eWOM is found to be capable of influencing the consumers' attitude and behaviour. The impact is especially strong in the hospitality and tourism industry, whose intangible products are difficult to evaluate prior to consumption (Cheung & Thadani, 2012). Individuals generate eWOM via different media platforms to share their travel experiences, meanwhile, they rely more on eWOM generated by peers to support their travel decisions. Thus, how to elicit and effectively enhance consumers' propensity to write and use eWOM is of great importance to understand individuals' eWOM behaviour.

Consumers are both eWOM receivers as well as generators. Two major lines of eWOM behaviour antecedents' research are identified in prior studies. The first line of research is *antecedents of eWOM generation behaviour*, such as self-enhancement, self-efficacy, individuation, altruism, and so on (Chu & Kim, 2011; Ho & Dempsey, 2010). The second line focuses on the *antecedents of eWOM use* behaviour. In this stream, researchers mainly focused on examining the attitudinal and motivational factors leading to consumers' use of eWOM in decision support (Bronner & de Hoog, 2010).

However, little research has attempted to explore eWOM use and generating behaviours from the IS success perspectives. The design choices of an information system can profoundly affect the features of eWOM channels, such as to be an efficient or an inefficient one (Dellarocas et al., 2010). The features will also influence individuals' attitude and perceptions of an IS which leads to their IS use decisions. Whatever being eWOM receiver or generator, consumers' attitudes toward eWOM communication will significantly differ across media channels (Gvili et al., 2016). In this study, we explore the factors determining individuals' eWOM use and generation behaviour from the IS success perspective by including three dimension of quality perception of travel review website, namely information quality, system quality, and social quality.

2 Theoretical Foundation and Research Background

eWOM adoption and generation behaviour respectively attracted a spectrum of research from academia (Filieri, 2015). eWOM content quality has been argued to be a salient factor in predicting eWOM use behaviour. The valence (positive, negative or neutral eWOM), the emotional expression, or the volume will strongly influence the

credibility of the eWOM (Filieri & McLeay, 2014; Pan & Chiou, 2011). In addition, the features of eWOM systems for instance, media richness, interactivity and navigation, are also proposed to distinguish between various media (e.g., Chu & Kim, 2011; Rockmann & Northcraft, 2008). eWOM communication is also a social process, and researchers should pay attention to the social aspect of WOM (Alexandrov et al., 2013). For instance, both social bridging and social bonding are found to impact the judgments of the eWOM credibility in prior studies (see Westerman et al., 2012).

The IS success model by DeLone and McLean (1992, 2003) is selected as the theoretical foundation for this research. The IS success model suggests a comprehensive understanding of IS success by identifying multi-dimensions of system success measurement. The updated model consists of six interrelated success dimensions: system quality, information quality, service quality, and intention to use/use, user satisfaction, and net benefits. The IS success model has been widely used by IS researchers in understanding and measuring the dimensions of IS success, and in evaluating success of specific IS applications, such as virtual communities (Zheng et al., 2013).

The selection of success dimensions and specific metrics depends on the nature and purpose of the system being evaluated (Petter et al., 2008). In this study, we focused on travellers' eWOM generation behaviour and eWOM use in the travel review websites use. The *service quality* dimension in the IS success model is not included in the current research framework. Instead, *social quality* is incorporated into this model. This is because, service quality mainly captures the quality of typical service-related activities provided by IS, such as within organizations, or from online shopping websites. In this study, consumers' eWOM communication behaviour is more of a volunteer, non-commercial action within the social network of peer reviewers (Gvili et al., 2016). Therefore, social quality is incorporated into this model, which will be discussed in the next session in detail. Consequently, three quality dimensions are included in this study to explore eWOM generation and use behaviour, namely system quality, information quality, and social quality.

3 Research Framework and Hypotheses

3.1 Information Quality and eWOM Behaviour

Information quality refers to the desirable characteristics of the system outputs (Petter et al., 2008). User generated reviews are the lifeblood of travel review website, thus the information quality perception of eWOM is the main quality of website information outcomes in the context of review website. Among all the travel information sources available, user generated eWOM are perceived to be the most persuasive and crucial information sources determining travellers decision-making (Zhang et al., 2014). Thus, in this study, the information quality assessed is the quality of eWOM generated by customers rather than other information output by the websites.

Information quality has been proved to impact users' information seeking and sharing behaviours (Park et al., 2014). Information quality was frequently conceptualized to be a synthesis of different sub-dimensions. Based on previous research on eWOM quality and information quality of eWOM this study is shaped in four dimensions: accuracy, completeness, timeless, and sidedness (Filieri & McLeay, 2014; Wixom & Todd, 2005).

Information accuracy represents a user's perception about the correctness of information (Wixom & Todd, 2005). Information accuracy has been validated to be an important factor determining information quality (Xu et al., 2013). It is found that the accuracy of the eWOM facilitates individuals to use eWOM to support their travel related decisions (Filieri & McLeay, 2014). Thus, we propose:

H1a: eWOM accuracy positively associates with travellers' eWOM use.

H1b: eWOM accuracy positively associates with travellers' eWOM generation.

Information completeness represents the degree to which eWOM on a travel review website provides all the necessary information (Wixom & Todd, 2005). eWOM with more complete information has been proved to be more useful and lead to consumers' information use in the research context of online opinion platforms (Cheung et al., 2008). On the other hand, with more complete review information available, customers will be more attracted to contribute their own experience via that review website. Thus, we propose:

H2a: eWOM completeness positively associates with travellers' eWOM use.

H2b: eWOM completeness positively associates with travellers' eWOM generation.

Information timeliness represents a user's perception of the degree to which the information is up to date (Wixom & Todd, 2005). A high level of perceived information timeliness will be more likely to meet travellers' information needs, and increase the likelihood for travellers to use the information. In addition, with timely and newly posted eWOM on travel review websites, the higher interaction will be perceived, which will stimulate customers' contribution behaviour. Hereby, we propose:

H3a: eWOM timeliness positively associates with travellers' eWOM use.

H3b: eWOM timeliness positively associates with travellers' eWOM generation.

Information sidedness indicates whether a review contains both positive and negative comments on a product/service. Two-sided reviews have been found to be more credible and unbiased than one-sided reviews (Cheung et al., 2012). Prior research found travellers prefer two-sided reviews for travel decision support (Filieri & McLeay, 2014). With conflicting reviews available, travellers would be more likely to join the discussion if the given argument conflicts with their own experience. Thus:

H4a: eWOM sidedness positively associates with a travellers' eWOM use.

H4b: eWOM sidedness positively associates with a travellers' eWOM generation.

3.2 System Quality and eWOM Behaviour

System quality is defined as a desirable characteristic of an IS (Petter et al., 2013). With more information available but limited information processing capability, users need an IS with good features to minimize their efforts on processing information (Jones et al., 2004). Such as, users' participation in contributing knowledge in virtual community is largely facilitated through an effective technical infrastructure (Markus, 2005). Wixom and Todd (2005) found reliability, flexibility, integration and accessibility serve as antecedents of system quality. Filieri and Willison (2016) found four dimensions of system quality in the context of knowledge management system, i.e. reliability, flexibility, response time, and integration. In this study, four dimensions of system quality were selected based on their representativeness and relevance to travel review websites.

System reliability refers to the dependability of system operation and the technical availability of a system over time (Wixom & Todd, 2005). A reliable system should have quick error recovery and less technical problems. The reliability dimension of system quality was tested to be a strong predictor of system use (Filieri & Willison, 2016). A eWOM system with frequent malfunctions is not perceived as reliable by users. Therefore, we propose:

H5a: The system reliability positively associates with a traveller's eWOM use.
H5b: The system reliability positively associates with a traveller's eWOM generation.

System integration refers to the way the system allows data to be integrated from various sources to enable effective decisions (Wixom & Todd, 2005). A travel review website can integrate different eWOM from different travellers with rich content. Integration is a task-related property and the more complex the task is, the higher the need for integration (Nelson et al., 2005). Travel decision-making is a complex task with numerous alternatives to choose from, especially with the changing travel pattern from group to individual travel. Thus, the integration capacity might motivate users to use and post eWOM. Therefore, we propose:

H6a: The system integration positively associates with travellers' eWOM use.
H6b: The system integration positively associates with travellers' eWOM generation.

System flexibility refers to the way the system adapts to changing demands of the user (DeLone & McLean, 2004). The ability to automatically adapt online reviews to match travellers' circumstances is the main attractiveness of a travel review website. It is important for a travel review system to present only high quality and a limited set of relevant messages as retrieval result according to user's request (Zhang & Watts, 2008). Thus, we propose:

H7a: The system flexibility positively associates with travellers' eWOM use.
H7b: The system flexibility positively associates with travellers' eWOM generation.

System response time refers to the degree to which the system offers timely response to requests for information or action. Response time of website is important, as users are often unwilling to wait more than a handful of seconds for a response. According to a rational view, travellers economize on time and effort when they search for information (Filieri & McLeay, 2014). Therefore, we propose:

H8a: The system response time positively associates with travellers' eWOM use.
H8b: The system response time positively associates with travellers' eWOM generation.

3.3 Incorporating Social Quality to D&M Success Model

The received social benefit is one of the distinct motivations for consumers to engage in eWOM communication (Hennig-Thurau et al., 2004). Social characteristics are identified as independent variables that focus on people as one important dimension for IS success (Petter et al., 2013). eWOM is peer-to-peer communication via online channels. Therefore, the social relationship-related variables are crucial in comprehending the underlying eWOM process and behaviours. They provide insights into the properties of social relations by which eWOM behaviours transpire. Thus, in this study social quality is incorporated to the IS success model. Social determinants are illustrated as the category of variables related to the impact that others within a person's peer group or social network influence an individual. In this study, social presence and social interaction are two constructs included in social quality.

Social presence is the extent to which a medium allows a user to experience others as being psychologically present (Gefen & Straub, 2003). Social presence is embedded in communication theory, and is characterized by some researchers as the capability of the medium to transmit information richness. It is empirically tested to have positive impact on the development of trust as trust is formulated within the social environment (Cyr et al., 2007). Therefore, for eWOM communication on travel review websites, we propose:

H9a: The social presence positively associates with travellers' eWOM use.
H9b: The social presence positively associates with travellers' eWOM generation.

Social interaction creates the context for active communication, and enables the development of a sense of mutual interdependence and connection (Yadav & Varadarajan, 2005). Interaction with other reviewers on a travel review website could enhance the credibility of reviews, and associate with their adoption of peers' eWOM. Computer mediated communication with a higher degree of interactivity has been suggested to be more likely to satisfy and retain users (Nambisan & Baron, 2007). In the context of travel review websites, the social interaction might also facilitate users' eWOM contribution behaviour. Thus, we propose:

H10a: The social interaction positively associates with travellers' use of eWOM.
H10b: The social interaction positively associates with travellers' eWOM generation.

4 Data Collection

4.1 Instrument Development

Questions from prior validated instruments were compiled to represent each construct. The wording was modified to fit the travel review website context in this study. All measurement scales used in the present study were measured using a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) (see Appendix 1). The instrument was reviewed by both academics and practitioners with knowledge of system success and eWOM in tourism. A pilot study among 20 Chinese users of travel review websites was conducted to test the logic and understandability of the texts.

4.2 Sample

The target sample is the travel review websites users, who recently used and posted eWOM. For reaching the most potential participants, our survey was conducted with the help of an online travel service company in China. The link to the questionnaire was distributed to the customers and the followers of the company's official social media account. The questionnaire has been run for four weeks from April 16th to May 15th, 2016. A total number of 351 responses were collected in the survey. 147 were excluded from subsequent analysis because the respondents' had never posted eWOM. The final sample consists of 204 valid respondents.

The sociodemographic and related descriptive characters of the respondents are reviewed first. The sample comprised 42.6% males and 57.4% females. Among the respondents, 91.7% had made at least two leisure trips in the previous year, which indicated a relatively high leisure travel frequency. 69.1% of them preferred a self-organized travel style and 26% preferred a customized travel style, which indicates a propensity for referring to their peers' travel reviews when making their travel decisions. 67.2% of our respondent indicated they post their own reviews related to their travel experience on travel review website.

5 Data Analysis and Results

Reliability, convergent validity and discriminant validity were assessed for the measurement model. *Reliability* was assessed by Cronbach's alpha for each construct (Nunnally et al., 1967). As shown in Appendix 1, all Cronbach's alpha values

were from 0.77 to 0.89, which indicates good item reliability. The *convergent validity* of the measurement model was assessed with Average Variance Extracted (AVE) and Composite Reliability (CR). The critical values for CR and AVE are 0.70 and 0.50 respectively (Fornell & Larcker, 1981). As summarized in Appendix 1, all CR and AVE values fulfil the recommended threshold with CR above 0.88. The AVE values are all above the recommended 0.5, which means that more than one-half of the variance observed in the items was accounted for by their hypothesized constructs. All the item loadings are higher than the recommended level of 0.70, which also indicates good convergent validity. *Discriminant validity* can be demonstrated when the squared root of the AVE for each construct is higher than the correlations with all other constructs (Fornell & Larcker, 1981). The results for the current research model are summarized in Appendix 2, which suggests adequate discriminant validity for all the measurements.

Having established an adequate measurement model, the structural model of the hypotheses is tested with SmartPLS 3.0. The proposed hypotheses on the impact from decomposed dimensions of the three quality-constructs on eWOM use and generation behaviour were tested. Figure 1 shows the overall explanatory power and estimated path coefficients (all significant paths are marked with asterisks). By using the bootstrap re-sampling procedure, a test of significance for all paths was performed. The results illustrate that the exogenous variables explain 47.0% of the variation in eWOM use behaviour, and 29.6% of users' eWOM generation behaviour.

According to the path correlation results, eWOM use behaviour is significantly determined by information completeness ($\beta = 0.25$, $p < 0.01$), system reliability ($\beta = 0.25$, $p < 0.001$), and social interaction ($\beta = 0.34$, $p < 0.001$). eWOM generation behaviour is not significantly influenced by information quality. However, two dimensions of system quality, system reliability ($\beta = 0.18$, $p < 0.001$) and system integration ($\beta = 0.22$, $p < 0.05$) influence eWOM generation behaviour

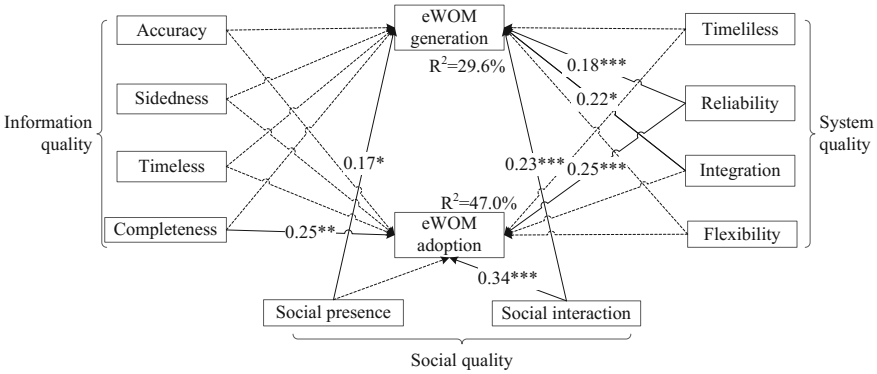

Fig. 1 Results of structural model

significantly. Both dimensions of social quality evaluated in our study were found to significantly influence eWOM generation behaviour, social presence ($\beta = 0.17$, $p < 0.05$), and social interaction ($\beta = 0.23$, $p < 0.001$).

6 Discussion and Conclusion

This study applies the IS success model in the context of online review system. We measured the success dimension of system use as eWOM use and eWOM generation behaviour. For the groups of travellers who have used and generated eWOM, we found different influence of three quality dimension for their eWOM behaviours. Information quality (information completeness), system quality (system reliability), and social quality (social interaction) all exert significant impact on their eWOM use from travel review websites. However, only system quality (social interaction) and social quality (system reliability) have significant impact on travellers' eWOM generation behaviour on travel reviews websites. This study has several implications for both academia and practitioners.

This study has several theoretical implications. First, this study applies an IS success model to review system use in the context of e-tourism. It indicated a good application of this theoretical model in the context of online review systems. Second, we extended the IS success model by incorporating social quality into the quality dimensions of the original (DeLone & McLean, 2004) success model. The prevalence of social media and user-generated content has made social quality an important predictor of system use. In addition, social presence and social interaction with other peers in the review system are important attributes contributing to system success.

Our findings also have practical implications. First, this study has important implications for review system developers and designers on the dimension of social quality of system success. Our results indicate that social quality of a system is another vital aspect for the effectiveness of a review system. Since eWOM is a social phenomenon that occurs in group settings with electronic elements facilitated by new communication media, the more consumers' interact in a virtual group, the more likely they will use eWOM (Lingreen et al., 2013). What's more, with more interaction with peer reviewers, they are more likely to reflect their own knowledge and enhance their reputation as experts about specific products by contributing their own eWOM. Higher level of interaction will motivate users' eWOM adoption and generation behaviour. Generation behaviour is also facilitated by the social presence perceived in the eWOM communication channel.

Secondly, we draw the attention on different attributes of information quality and system quality of travel review websites. This finding contributes to both e-tourism marketers and review system designers. For instance, among all the four

dimensions reviewed, completeness of eWOM is the most influential attribute of eWOM use for experienced travellers'. Review systems and e-tourism marketers can thus encourage customers to post reviews from all aspects, for instance, reviews on hotel, destination, restaurant, and reviews on all aspects related to one purchase experience.

However, the accuracy, sidedness, and timeliness of eWOM content were not significantly determinants for travellers' eWOM use behaviour. It indicates that travellers will adopt an online review regardless of when it was generated. Another explanation for these non-significant path coefficients is the sample we used in this research. The sample included in this study are more experienced travellers who generated their own eWOM, and with a medium travel frequency of four times last year. This suggests that for experience travellers, and experienced eWOM users address the completeness of information more than the accuracy, sidedness, or timeliness.

For practitioners in tourism industry who aim to enhance customers' propensity to post eWOM on a review channel. As a eWOM generator, traveller's generation behaviour is determined more by the eWOM system quality of system reliability and integration, and the social quality of social interaction, rather than the information quality of eWOM. Review system managers and e-tourism practitioners should improve the system technical function to be more reliable, dependable, and capable of integrating data from various sources, such as link to firms' information. Among the four dimensions of system quality evaluated in this study, reliability was found to be the only one significant determinant for both a consumers' eWOM use and generation behaviour.

7 Limitations and Future Research

Every research comes with limitations. As for this study, we focused on exploring eWOM behaviour on eWOM channel from system success perspective. Only one eWOM communication channel, i.e. travel review website was selected, the explanation of eWOM behaviour would be more elaborate taking other eWOM channels into comparison. Secondly, this study did not clarify the specific context of eWOM. Future research may consider the different effect of information quality, system quality, and social quality on system use among review systems in different tourism aspects, for instance, in the context of hotel, restaurant, or travel destination.

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Appendix 1

Items, Factor Loadings, Cronbach's Alpha, AVE and CR

Constructs	Items	A	AVE	CR
Information accuracy (IA)(Wixom & Todd, 2005)	IA1: The eWOM provided the correct information for my travel plan (0.85) IA2: There were few errors in the information I obtained from eWOM (0.87) IA3: The information provided by eWOM is accurate (0.91)	0.85	0.77	0.91
Information completeness (IC) (Wixom & Todd, 2005)	IC1: The eWOM provide me with a complete set of information for my travel (0.89) IC2: …comprehensive information for my travel (0.91) IC3: …all the information I need for my travel (0.84)	0.86	0.78	0.91
Information sidedness* (IS) (Cheung et al., 2012)	IS1: The eWOM include both pros and cons on the discussed product/service (0.94) IS3: …both positive and a negative comments (0.93)	0.85	0.87	0.93
Information timeliness (IT) (Wixom & Todd, 2005)	IT1: The eWOM provided me with the most up-to-date information for my travel related decision (0.85) IT2: The eWOM the most current information for my travel related decision (0.92) IT3: The eWOM from the travel review sites is always up-to-date (0.84)	0.84	0.76	0.90
System reliability (SYR) (Wixom & Todd, 2005)	SYR1: The travel review website operates reliably (0.90) SYR2: …performs reliably (0.77) SYR3: The operation of the travel review websites is dependable (0.88)	0.79	0.70	0.88
System integration (SYI) (Wixom & Todd, 2005)	SYI1: The travel review website effectively integrates data from different aspects of travel (0.78) SYI2: …pulls together information that used to come from different websites and information sources (0.84) SYI3: …effectively combines data from different aspects of travel (0.80)	0.88	0.81	0.93
System flexibility* (SYF) (Wixom & Todd, 2005)	SYF2: The travel review website can flexibly adjust to new demands or conditions during my usage (0.76) SYF3:…is versatile in addressing needs as they arise (0.82)	0.83	0.86	0.92

(continued)

(continued)

Constructs	Items	A	AVE	CR
System response time (SYT) (Wixom & Todd, 2005)	SYT1: It takes short time for the website system to respond to my requests (0.84) SYT2: The travel review website system provides information in a timely fashion (0.78)	0.87	0.88	0.94
Social interaction (INT) (Ko et al., 2005)	INT1: Using the travel review websites enables me see what other travellers said (0.80) INT2: …enables me keep up with what's going on with regard to my travel (0.75) INT3: …enables me express myself freely regarding my own travel (0.84)	0.79	0.71	0.88
Social presence*(SP) (Gefen & Straub, 2003)	SP1: There is a sense of sociability in the review website (0.79) SP2: There is a sense of human contact in the review website (0.75) SP4: There is a sense of existence in the website (0.76)	0.89	0.81	0.93
eWOM use (USE) (Sussman & Siegal, 2003)	USE1: I use eWOM on the website. (0.95) USE2: The eWOM provided motivates me to take action/reserve it. (0.77) USE3: I agree with the eWOM provided on the website. (0.87)	0.85	0.77	0.91
eWOM generation behaviour(GB) (Munar & Jacobsen, 2014)	GB1: I shared my travel related experiences in the websites (0.76) GB2: I provided my travel experiences at the request (0.92) GB3: I posted my comments on the websites after my travel (0.82)	0.87	0.79	0.92

Note *The items IS3, SYSF1 and SP3 were deleted due to its low factor loading
A Cronbach's Alpha; *AVE* Average Variance Extracted; *CR* Composite Reliability

Appendix 2

Discriminant validity: correlation matrix and the squared root of AVE

Construct	1	2	3	4	5	6	7	8	9	10	11	12
IA	0.88											
USE	0.51	0.87										
IC	0.75	0.55	0.88									
GB	0.32	0.57	0.38	0.88								
INT	0.44	0.54	0.49	0.44	0.80							
IS	0.49	0.37	0.55	0.30	0.57	0.93						
IT	0.59	0.50	0.74	0.35	0.53	0.63	0.87					
SP	0.52	0.42	0.59	0.39	0.64	0.61	0.56	0.90				
SYF	0.48	0.38	0.61	0.36	0.45	0.46	0.61	0.48	0.92			
SYI	0.56	0.47	0.64	0.42	0.45	0.39	0.56	0.36	0.65	0.90		
SYR	0.50	0.50	0.47	0.37	0.35	0.26	0.46	0.28	0.43	0.60	0.83	
SYT	0.58	0.46	0.56	0.35	0.47	0.43	0.56	0.40	0.62	0.75	0.61	0.94

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Flight Cancellation Behaviour Under Mobile Travel Application: Based on the Construal Level Theory

Hyunae Lee, Namho Chung and Choong-Ki Lee

Abstract With mobile commerce (M-commerce), tourists can easily reserve and cancel a flight, hotel and restaurant seats anywhere and anytime with their smartphones. However, several factors of M-commerce stimulate individuals to buy or reserve products and services impulsively, which induces guilt (or regret) and result in cancellation. Cancellation causes loss of revenue, especially, flight cancellation can be more threatening to travel agencies due to perishability of airline seats. Therefore, it is important to investigate differences between cancelled and uncancelled reservations. This study collected secondary data and tried to find out the differences between cancelled and uncancelled flight reservations by using t-test analysis. The results revealed that cancelled flights were reserved a shorter period of time before the departure and were made by individuals who are experienced in flight reservation rather than uncancelled flights.

Keywords Travel agency · M-commerce · Flight cancellation · Temporal distance · Experiential distance · Price

1 Introduction

Mobile commerce (hereafter M-commerce) is "a type of e-commerce (electronic commerce) conducted via mobile devices" (Pavel & Vlad, 2016, p. 381). With the growth and generalization of smartphone the M-commerce market has also been

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growing. According to Statista (2016a) the M-commerce share of total digital commerce in the United States has increased ten times in only 6 years from 1.8% in the second quarter of 2010 to 18.6% in the first quarter of 2016. In addition, it is assumed that the number of buyers of M-commerce will surpass 1 billion in 2018 (Statista, 2016b).

M-commerce has three unique features; mobility, portability and wireless connectivity (Pavel & Vlad, 2016). These features enable buyers to purchase products and services at anytime and anywhere. Moreover, sellers in social commerce tend to use scarcity messages for products and services of limited quantity and time such as "sold-out imminent" in order to stimulate buyers impulsiveness (Song, Chung, & Koo, 2015). In this circumstance, buyers purchasing behaviour in M-commerce has become more and more impulsive and less considerate. However, this impulsive buying behaviour can easily end in cancellation. It has been acknowledged that there is a relation between impulsive buying behaviour and cancellation behaviour. Dedeoglu and Kazançoglu (2012) presented that impulsive consumption is an antecedent of consumer's guilt that enable them to cancel the order. Moreover, Bae, Nam, and Kim (2011) used order cancellation as a proxy of impulsive purchasing behaviour.

Cancellation might be one of the strongest conflicts among travel agencies, their suppliers (e.g. airlines and hotels) and their buyers (e.g. customer). If a customer cancels the reservation after the cancellation deadline or doesn't guarantee it in advance, cancellation fee might be the only tool to compensate for the loss of revenues of travel agencies and suppliers (Ivanov, Stoilova, & Illum, 2015). In the case of a flight reservation, if it is cancelled within a short period of time before the date of departure, travel agencies (or airlines) should have a clearance sale for unsold airline seats before the plane takes off, since unsold seats lost their value when the airplane depart (perishability) (Sahay, 2007). Therefore, airlines determine overbooking level by predicting the probability of booking survival for reducing costs (Iliescu, Garrow, & Parker, 2008).

However, little has been done to study flight cancellation in M-commerce. Most of the M-commerce studies have only focused on customers' purchase behaviour (e.g. Okazaki & Mendez, 2013; San-Martin & López-Catalán, 2013). Therefore, this study tries to explain the relationships between customer' flight cancellation behaviour with impulsive buying behaviour and user experience by employing the concept of temporal and psychological distance. Further, this study assumed that the flight price is also related to flight cancellation. Therefore, the aims of this study are twofold; (1) to investigate and find out the differences between cancelled and uncancelled flight reservations made through a smartphone in accordance with temporal and experiential distances and flight price by adopting t-test analyses, and (2) to propose practical implications based on the results supporting travel agencies to manage cancellation rates.

2 Theoretical Background

2.1 Construal Level Theory

Psychological distance means people's "subjective experience that something is close or far away from the self, here, and now" (Trope & Liberman, 2010, p. 440). Originally, the concept of the psychological distance includes three dimensions of time, space and culture (Trope, Liberman, & Wakslak, 2007), however, several researchers have enhanced it by incorporating experiential distance, social (or socio-cultural) distance and so on (Ankomah, Crompton, & Baker, 1996; Massara & Severino, 2013). These psychological distances can be explained by Construal Level Theory (CLT) suggested by Trope and Liberman (2010). According to CLT, individuals are likely to use low-level and concrete construal for a psychologically near event, whereas for psychologically far events, they are likely to use high-level and abstract construal. For instance, cancelling a flight reservation behaviour can be construed as just "not leaving" (high-level and abstract construal), but, as time goes by, it can be construed as "having to pay cancellation fee" (low-level and concrete construal).

CLT has been commonly employed in order to explain tourists' different construal levels for travelling. Massara and Severino (2013) examined the relationships among the socio-cultural, experiential, spatial and psychological distance between tourists and heritage site, and the effects of these distances on tourists' construal level. Kim, Kim, Kim, and Magnini (2016) also investigated whether temporal and spatial distances have impacts on the individual's preference for promotional messages of hotels.

When people construe the psychologically distant object, they tend to use stereotypes for it (Liberman, Sagristano, & Trope, 2002), have strong confidence in doing it (Nussbaum, Trope, & Liberman, 2003) and evaluate it positively (Nussbaum, Trope, & Liberman, 2001, recited from Liberman et al., 2002). On the other hands, when people construe the psychologically near object, they tend to use contextual information for it (Liberman et al., 2002) and evaluate it relatively neutrally and objectively (Nussbaum et al., 2001, recited from Liberman et al., 2002). In addition, it was found that a desirable option is preferred in the close distances whereas a feasible option is preferred in the far distance (Liberman & Trope, 1998). In this vein, it can be assumed that cancellation behaviour commonly occurs in the shorter psychological distance and lower level of construal.

2.2 Impulsive Buying Behavior in Mobile Commerce

Impulsive buying behaviour is defined as "sudden, compelling, hedonically complex buying behaviour in which the rapidity of an impulse decision precludes thoughtful and deliberate consideration of alternative information and choices"

(Bayley & Nancarrow, 1998, p. 99). Impulsive buying behaviour have been mainly investigated in the context of websites (Liu, Li, & Hu, 2013); social commerce (e.g. Song et al., 2015); and recommendation systems (e.g. Chung, Koo, & Kim, 2013), since online purchase has been regarded as a deficient self-regulation buying behaviour (LaRose & Eastin, 2002).

Characteristics of both M-commerce and travel have been regarded as being able to stimulate individuals' impulsive buying behaviour. First, the generalization of the Internet and smartphones has made individual's decision-making process more impulsive and less considerate (San-Martin & López-Catalán, 2013; Zhang & Yuan, 2002). This is because M-commerce increases consumer's access to products and service, and makes the purchases and payment process simpler (Zhang & Yuan, 2002). Furthermore, serendipity (e.g. pop-up advertisement), scarcity messages (e.g. limited time and quantity) and discounted prices, also stimulate consumers to buy products and services with less consideration and impulsively (Song et al., 2015).

Moreover, impulsive buying behaviour tend to be easily induced by hedonic products such as travel (Bayley & Nancarrow, 1998). Individuals (potential tourists) can easily make a reservation for hotels, flights, restaurants anywhere and anytime. For instance, information about clearance sale or images of beautiful destinations can stimulate potential travellers. In this vein, M-commerce has been treated as an important distribution channel in the tourism industry (Douglas & Lubbe, 2013).

2.3 User Experience

The user experience concept has been understood in various way. User experience can be defined as "anchoring or proximal experience" (Gravill, Compeau, & Marcolin, 2006, p. 381), and has direct and indirect effects on user's future knowledge, expectation, intention and behaviour (Jones & Jones, 1995). In the context of information technology (IT) acceptance, user experience has been regarded as a strong predictor for enhancing user's knowledge and ability, which consequently influence to use it (Venkatesh, 2000). In the tourism context, previous studies have investigated the impacts of tourists' experiences in destinations (e.g. Lehto, Kim, & Morrison, 2006), information technologies or systems (e.g. Kang & Gretzel, 2012), and socio-cultural environment (e.g. Massara & Severino, 2013). The results commonly showed that the more experience a tourist has concerning a destination, information technology or system and socio-cultural environment, the more strongly his or her cognitive and affective perception increased.

User experience can be understood in the context of CLT as experiential distance as well. Experiential distance is one of the main dimensions of psychological distances with socio-cultural and spatial distance (Massara & Severino, 2013). Close experiential distance means that an individual has relatively more experience in an object (e.g. mobile application or reservation system) rather than those in the distant experiential distance. According to a previous study user experience in an

object (e.g. Internet) and has been found to be a strong predictor for users' behaviour (e.g. Online shopping) (Blake, Neuendorf, & Valdiserri, 2003).

3 Research Model and Hypotheses Development

Based on the aforementioned theoretical background, we proposed the following conceptual model (Fig. 1). We investigated the differences of psychological distance (e.g. temporal and experiential distances), price of flight and demographic characteristics between cancelled and uncancelled groups.

3.1 Temporal Distance

Temporal distance was operationalized as interval days from the date of reservation to departure. Therefore, closer temporal distance means customers reserved airline tickets relatively impulsively. Impulsive buying behaviour is a type of unplanned action (Weinberg & Gottwald, 1982). Consumers make a purchase or reservation with less consideration about whether products and services are really needed (Beatty & Ferrell, 1998). Scarcity messages and serendipitous information provided by sellers in social commerce are strong predictors of consumer's impulsive buying behaviour, which induce people to click or touch the flight reservation button.

However, these unplanned consumption can easily end in cancellation since it tends to make the consumer feel guilty and trigger cancelling the order (Dedeoglu & Kazançoglu, 2012). San-Martin and López-Catalán (2013)'s results also showed that impulsiveness has negative effects on M-commerce shopper's satisfaction. It might be attributable that customers only focused on the immediate pleasure of the

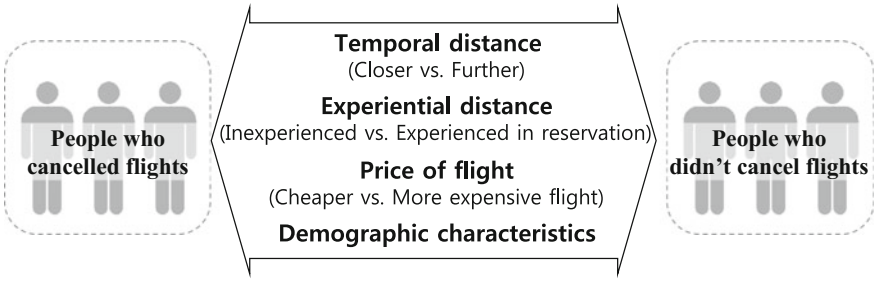

Fig. 1 Conceptual model

buying behaviour itself, but not on the negative or objective consequences of the behaviour. Further, as the time interval between the formation of intention and actual behaviour lengthens, people are more likely to be exposed to more and new information, which consequently make people change their attitudes (Fishbein & Jaccard, 1973). Kah, Lee, and Lee (2016) presented that some trip plans might not be actualized due to the temporal distance between the intention and the actual behaviour. Iliescu et al. (2008) found that recently purchased airline seats were more likely to be cancelled than those associated near flight departure dates. In the context of this study, it can be regarded that, as the day of departure is getting closer, the concrete considerations such as considerations about the flight price, alternatives or trip plans can occur. So, it can be inferred that the interval between the dates of reservation and the departure in cancelled reservations is shorter than one in uncancelled reservations. Therefore the following hypothesis was proposed.

H_1: The flight cancellation group would have less interval between reservation and departure than the uncancellation group.

3.2 Experiential Distance

User experience in IT is one of the strongest factors of increasing user's ability and knowledge to use it (Venkatesh, 2000). In the context of CLT, the level of user experience in IT can be understood as the experiential distance between a user's experience and IT. In this vein, closer experiential distance presents that an individual is an experienced IT user rather than if he or she is in a further experiential distance. In this study, experiential distance was conceptualized as the extent to which customers have prior experience of reserving an independent tour. Therefore, closer experiential distance means that a customer is relatively more used to making a reservation. According to previous studies, user experience in an object (e.g. Mobile) has been observed as a strong predictor of user's behaviour relevant to it (e.g. Mobile shopping). For instance, online shoppers are more likely to be experienced Internet customers (Blake et al., 2003).

Making or cancelling a flight reservation by using smartphone applications needs somewhat experiences or knowledge about the reservation system, the reservation policy and airlines. Moreover, cancelling a flight is a relatively unusual behaviour compared to making a reservation. In this vein, it can be inferred that individuals who are experienced in reservation through the smartphone feel free to cancel their flight reservation rather than those who are inexperienced. Therefore, the following hypothesis was proposed.

H_2: The flight cancellation group would have more experience in reserving an independent tour than the uncancellation group.

3.3 Price of Flight

Due to the perishability of tourism products and services, it is impossible to return or resale unused ones. For instance, airline seats lose their value as soon as the plane takes off (Sahay, 2007). Therefore, in order to manage the costs resulting from cancellation, travel agencies and airlines are charging a cancellation fee. Depending on the policies of airlines and travel agencies, cancellation fees have been charged based on the price of a flight, or the remaining days until the departure. Furthermore, in case of reserving airline seats on foreign airlines, consumers can suffer time-consuming and complex refund procedures. These economic constraints can be inhibitors of flight cancellation. Therefore, it can be inferred that cancelling an expensive flight might become a burden for customers. Thus, the following hypothesis was proposed.

H_3: The flight cancellation group would have reserved cheaper airline seats than the uncancellation group.

4 Methods

4.1 Data Collection

The data was collected from Hana tour, the biggest travel agency in South Korea. Hana tour has a wide business area, including differentiated tourism services (e.g. HanaPack, Hana Honeymoon, etc.), tourism wholesale, hotels, duty free shop, and cultural and online business. In addition, Hana tour provides a high level of IT services such as real-time booking system (MAIDAS). Moreover, they launched an integrated management information system for effective management. With this system, we could collect secondary data which shows information about customers' demographic features (e.g. age and gender), actual times of reservation and cancellation, types and prices of products they reserved, the number of prior purchase experiences, and channels they used for making a reservation (e.g. website or mobile application). We selected the cases of reservations of airline tickets which were made through the mobile application. Since this study focused on what makes people to cancel the reservation through the mobile application, the cases of partial or automatic cancellation (just ticketing, no paid) and no-show were eliminated. As a result, a total number of 650 cases was used for this study.

4.2 Measures

The temporal distance was calculated by subtracting the date of reservation from the date of departure. For instance, if the date of reservation was January 1 and the date

Table 1 Descriptive statistics of the variables

		Min	Max	Mean	S.D
Days between the date of reservation and departure (temporal distance)	Total	1	229	46.63	44.92
	Uncancelled	1	229	50.35	47.22
	Cancellation	1	205	44.05	43.13
The number of prior experience of reserving independent tour (experiential distance)	Total	0	45	4.84	5.94
	Uncancelled	0	45	3.83	5.46
	Cancellation	0	45	5.54	6.16
Price per person (KRW)	Total	38,200	1,986,600	428,666	309,001
	Uncancelled	99,000	1,986,600	467,047	321,172
	Cancellation	38,200	1,920,600	402,080	297,813

S.D. Standardized deviation

of departure was January 10, temporal distance would be 9. Therefore, 'close temporal distance' means people made a flight reservation relatively impulsively. Experiential distance was measured by the number of prior experiences of reserving independent tours. Therefore, 'close experiential distance' means people have relatively more experience of making reservations. In addition, price was operationalized as flight price. Finally, flight cancellation is a binary variable; to be measured as '1' if the flight is cancelled and '0' otherwise (Table 1).

5 Analysis and Results

5.1 Differences in Demographic Characteristics

Table 2 presents demographic differences between cancelled and uncancelled reservations using cross-tabulation analysis. Among the total cases, more than half of them (384, 59.1%) were cancelled.

Cancelled and uncancelled reservations have significant differences in accordance with gender ($p < 0.05$), travel type ($p < 0.001$) and times of independent tour reservation experience ($p < 0.001$). It was observed that women (301, 78.4%) are more likely to cancel their flight reservation than men (83, 21.6%). It can be explained by that women's impulsive buying behaviours tend to be emotionally oriented, while men's one tends to be instrumentally oriented (Dittmar, Beattie, & Friese, 1995). Single travellers (241, 62.8%) were found to be more likely to cancel their flight reservation rather than accompanied travellers (143, 37.2%). It can be assumed that it is because single travellers can easily change or cancel their travel plans. In addition, individuals who are inexperienced in reserving independent tours were found to be less likely to cancel their reservations (62, 23.3%) rather than those who are experienced (33, 8.6%). More than eighty percent of the reservations

Table 2 Cross-tabulation results

Profile category (*p*-level)		Uncancelled (n = 266, 40.9%)		Cancellation (n = 384, 59.1%)		Total	Chi-squared *(p-value)*
		N	%	N	%		
Gender	Male	76	28.6	83	21.6	159	4.116 *(0.050)*
	Female	190	71.4	301	78.4	491	
Age	10's	4	1.5	4	1.0	8	6.799 *(0.240, n.s)*
	20's	106	39.8	150	39.1	256	
	30's	105	39.5	177	46.1	282	
	40's	40	15.0	38	9.9	78	
	50's	10	3.8	15	3.9	25	
	60 ≥	1	0.4	0	0.0	1	
Travel types	Single	130	48.9	241	62.8	371	12.372 *(0.001)*
	Accompanied	136	51.1	143	37.2	279	
Times of independent tour reservation experience	0	62	23.3	33	8.6	95	29.065 *(0.001)*
	1–5	143	53.8	237	61.7	380	
	6–10	36	13.5	60	15.6	96	
	11–15	11	4.1	18	4.7	29	
	16–20	10	3.8	27	7.0	37	
	Above 20	12	4.5	35	9.1	47	

were made by young individuals (10's–30's) in both uncancelled (215, 80.8%) and cancelled reservations (331, 86.2%).

5.2 *Differences in Psychological Distances and Price*

Table 3 and Fig. 2 present differences in means between the cancelled and uncancelled reservations using t-test. The results show that there are statistically significant differences between the cancelled and uncancelled reservations with respect to temporal distance, experiential distance and flight price. First of all, the mean value of interval days between the dates of reservation and departure in the uncancelled reservation is smaller than for cancelled reservations ($M_{noncancelled} = 50.35$ vs. $M_{cancelled} = 44.05$, $p < 0.1$). This indicates that relatively impulsively reserved flights are more likely to be cancelled than one reserved a long period before the departure. Thus, the hypothesis H_1 was supported. This result is similar with the assertion of Dedeoglu and Kazançoglu (2012) that impulsive consumption induces consumer's guilt and cancellation. Second, the mean value of experiential distance in the cancelled reservations is greater than one in the uncancelled reservations ($M_{noncancelled} = 3.63$ vs. $M_{cancelled} = 5.54$, $p < 0.001$).

Table 3 T-test results of psychological distances and flight price

(a) Temporal distance (Days between the dates of reservation and departure)				
Hypothesis H_1	Uncancelled (n = 266)	Cancelled (n = 384)	t-value (sig.)	Result
Flight cancellation group would have less interval between reservation and departure than uncancellation group	50.35	44.05	1.76 *(0.079)*	Supported
(b) Experiential distance (The number of prior experiences of reserving independent tour)				
Hypothesis H_2	Uncancelled (n = 266)	Cancelled (n = 384)	t-value (sig.)	Result
Flight cancellation group would have more experience in reserving independent tour than uncancellation group	3.63	5.54	−3.637 *(0.000)*	supported
(c) Flight price (per person, Korean Won)				
Hypothesis H_3	Uncancelled (n = 266)	Cancelled (n = 384)	t-value (sig.)	Result
Flight cancellation group would have reserved cheaper airline seats than uncancellation group	467,047 (USD481)	402,080 (USD360)	2.612 *(0.009)*	Supported

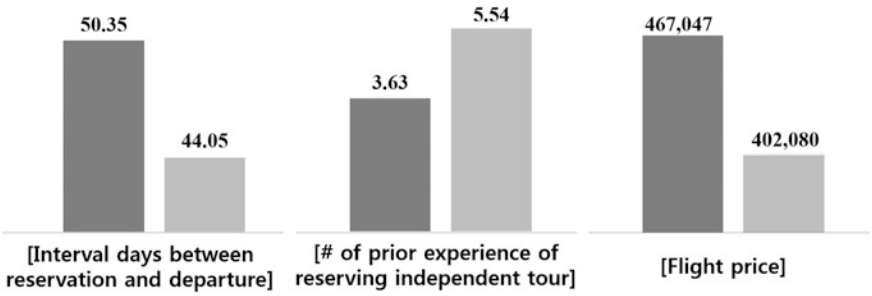

Fig. 2 T-test results of psychological distances and flight price (left bar uncancelled; right bar cancelled)

This indicates that people with more experience of reserving independent tours are more likely to cancel their reservations. Thus, the hypothesis H_2 was supported.

Finally, the mean value of price per person in the cancelled reservations is smaller than one in the uncancelled reservations ($M_{noncancelled}$ = 467,047 vs. $M_{cancelled}$ = 402,080, $p < 0.01$). This means that inexpensive flights are more likely to be cancelled than expensive ones. This might be attributable to the cancellation fee and the time-consuming refund process that people can't easily cancel their expensive airline tickets. Therefore, hypothesis H_3 was supported.

6 Discussion and Conclusions

6.1 Discussion

The results showed that there are significant differences between uncancelled and cancelled reservations in accordance with demographic characteristics (e.g. gender and travel types), psychological distances (e.g. temporal and experiential distance) and flight price. It was observed that the percentages of women occupied more than half of the total cancelled reservations. These might be attributable to stimulus of emotional factors of travel or travel advertisements of the mobile application. This can be supported by Dittmar et al. (1995)'s assertion that women's impulsive buying behaviours are likely to be oriented emotionally. Furthermore, it was found that single traveller's reservations comprise more than half of the cancelled reservations. This result is similar with Iliescu et al. (2008)'s study which revealed that travellers with two or more companions are less likely to cancel the flights than those who are single or have only one companion. It might be attributable to the possibility of arbitrary decision making of single travellers. Interval days between the dates of reservation and departure (temporal distance) in cancelled reservations were found to be shorter than those in uncancelled reservations. This indicates that impulsive reservation is likely to be concluded in cancellation rather than considered one. This can be supported by Dedeoglu and Kazançoglu (2012)'s assertion that impulsive consumption may induce consumer's guilt and order cancellation. The numbers of prior experiences of the reserving independent tour (experiential distance) in cancelled reservations were found to be more than those in uncancelled ones. This means that individuals having relatively more experience with reservations are more likely to cancel the reservation rather than those having less experience. Finally, flight price was found to be less expensive in cancelled reservations rather than uncancelled ones. We assumed that people can't easily cancel expensive flights due to cancellation fee and time-consuming refund process.

6.2 Theoretical and Practical Implications

This study put emphasis on cancellation behaviour, and compared the cancelled and uncancelled flight reservations. This attempts can provide useful insights for understanding flight cancellation behaviour. In addition, we analysed differences between cancelled and uncancelled reservations in accordance with temporal and experiential distances and flight price by using secondary data. Most of the previous studies about CLT have adopted survey or scenario-based experiments which have high risks of exposure to social desirability effect and common method bias. However, by using secondary data, this study was able to accurately calculate the actual interval days between the dates of reservation and departure as well as the number of previous experiences of reservation and flight price in both cancelled and uncancelled reservations.

Meanwhile, this study also provides practical implications for travel agencies. They can refer to this study in managing flight cancellation. It was showed that cancelled reservations had been made more impulsively than uncancelled reservations, which indicates that impulsive buying behaviour is more likely to result in a cancellation. Therefore, it implies that travel agencies should carefully stimulate tourists' impulsiveness. For instance, brief information about the flight and the cancellation policy should be presented at the conspicuous place on mobile application screen. Moreover, the flight cancellation group was found to have more experience of reserving independent tours than the uncancellation one. Therefore, it can be recommended to provide long-term reward programs such as a point-saving system. In addition, cheap airline tickets are more likely to be cancelled than expensive ones. Therefore, excessive events of discounting should be discouraged.

6.3 Limitations and Future Research Directions

However, this study has some limitations. First, this study just compared the mean values of temporal and experiential distances and flight prices of each cancelled and uncancelled reservation by using the t-test. Therefore, this study hasn't explained the differences of the impacts of psychological distances and flight price between the two groups. Therefore, further studies should compare the impacts of the psychological distances and flight prices of the two groups by employing the z-test. It will help researchers to understand how differently psychological distances and flight prices influence on the flight cancellation and departure. Second, because of limited scope and depth of information of secondary data, personal or situational reasons of flight cancellation, such as change of trip plan or economic constraint were not explained in this study. Only factors provided by flight reservation data via only mobile were analysed for this study such as dates of reservation, departure and price. Therefore, future studies are required to investigate personal or situational reasons of cancellation using a survey or interview. It will be helpful to understand why people cancel their flight reservation and, how these reasons make people to cancel or not to cancel their flight. Moreover, by employing both booking data via mobile and PC, what makes cancellation in mobile commerce environment can be investigated in more detail.

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A Closer Look at Tourist Information Search Behaviour When Travelling Abroad: What Is the Role of Online Marketing in Choice of Destination?

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Abstract Information search and the decision-making process of tourists have received great attention in tourism research literature and both are considered to be important theoretical and practical topics. This study contributes to these topics by studying international tourists during their trip in a destination using qualitative interviews and by focusing on the role of online marketing in tourists' decision-making process. Altogether 57 international tourists in Savonlinna, Finland were interviewed during summer 2016 to find out the factors that affected their decision to come to Savonlinna. The results demonstrate how important it is for destinations to understand their international customers and understand what the destination they should actually be promoting is. Banners and social media do not seem to play an important role in new customer acquisition, but search engine optimisation and content marketing as well as product quality are at the top of the list.

Keywords Destination choice · Information search · Social media · Online marketing · Decision-making

1 Introduction

For decades academics and practitioners have studied how tourists search for and use information. Information search is a crucial part of tourists' destination choice (Jacobsen & Munar, 2012). We know there are various types of decision-making models in tourism literature (Decrop & Snelders, 2004) and the process by which tourists choose the destination they are going to travel to is well established (Crompton, 1993). Information evaluation has become a core element in any destination decision (Tham, Croy, & Mair, 2013). Tourism destinations and businesses

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try to influence tourists' decision-making process so that the tourists choose their destination, but we are still lacking information on how to do that. Effectiveness of destination marketing is, especially regarding branding and positioning, still in question (Pike & Page, 2014).

We are now living in the age of social media and Web 2.0. Social media has tremendously changed the way people search for and use information according to existing literature (Xiang & Gretzel, 2010; Öz, 2015). Consumer-centric social media studies in travel and tourism have generally focused on the use and impact of social media in the research phase of the travel planning process (Leung et al., 2013). For destinations, this is especially interesting as they have to balance their marketing resources amongst many different channels and target groups. Hays, Page, and Buhalis (2013) identified that even among national tourism organisations, social media is still largely experimental and that strategies vary significantly. According to Jacobsen and Munar (2012), there is still a lack of empirical studies that include tourist assessments of possible effects of social media and Web 2.0 on tourist information acquisition and search. Social media has also become an important part of search engine results in tourism as searching has become an increasingly dominant mode in travellers' use of the Internet (Xiang & Gretzel, 2010). This has also led to ever-increasing use of social media by online tourism marketers as they try to get their message heard among potential customers. It has become an industry norm for a destination or tourism business to have a social media presence (Pesonen, 2011) and a huge number of destinations have their own Facebook-page and accounts on Instagram, Twitter and YouTube, among others. It is clear that marketing has the potential to have a great impact on intention to visit a destination and destination choice (Woodside & Lysonski, 1989), but it still remains unclear which type of marketing destinations and businesses can employ to have the largest impact and greatest effectiveness.

We know the influence of friends and relatives in travel decision-making (Gitelson & Kerstetter, 1995), the influence of children in tourist group holiday decision-making (Thornton, Shaw, & Williams, 1997), the use and impact of online travel reviews (Gretzel & Yoo, 2008), the influence of terrorism risks on international tourism decisions (Sönmez & Graefe, 1998), the influence of e-word-of-mouth on travel decision-making (Jalilvand & Samiei, 2012; Hernández-Méndez, Muñoz-Leiva, & Sánchez-Fernández, 2015; Murphy, Mascardo, & Beckendorff, 2007) and the importance of information sources in travel decisions (Bieger & Laesser, 2004). What we are constantly missing is how marketing influences decision-making of tourists when they are choosing their destination. We know that marketing is part of the information search and decision-making process, but so far the literature has failed to examine exactly what is this role and in which points of the information search process. Gursoy and McCleary (2004) state that marketers of a destination should have an overall picture of how tourists acquire information. Destination marketers also need to be aware of what is the actual destination the tourists are visiting as it is a central theme in many marketing messages (Reinhold, Laesser, & Beritelli, 2015, Beritelli, Bieger, & Laesser, 2014). Discussion of which measure of information search is the most

accurate and managerially useful (Fodness & Murray, 1997) is still ongoing and this study positions itself within this research topic.

This paper studies how online marketing, and especially social media marketing, affects tourists' choice of destination from a tourist point of view when a tourist is travelling abroad. This study has two research topics:

(1) How tourists define the international destination they are visiting and
(2) How international tourists perceive the role of destination marketing in their decision-making process.

The objective of this paper is to increase our knowledge of how tourists use information channels when travelling abroad and especially what the role of online marketing in destination choice is. There is still a lack of qualitative information on how online marketing affects destination choice. It is widely accepted that destination management organisations invest heavily in online marketing and especially social media marketing. We examine here how tourists in a destination perceive the online marketing that a destination does and how it affected their decision-making process. The results of this study are based on 57 detailed interviews conducted in Savonlinna, Finland during the summer of 2016 with international tourists.

2 Literature Review

2.1 Information Search

Information search is a well-established research topic in tourism (Jacobsen & Munar, 2012). Tourists search for and use a lot of information before they make their final decision of where to travel and what to do in the destination and a lot of this information search is conducted to reduce risks (Jacobsen & Munar, 2012). To understand tourists' information search, various models have been proposed and utilised, and especially process view has gained considerable support (Bieger & Laesser, 2004).

There are two types of information sources available for tourists: internal and external (Gursoy & McCleary, 2004). According to Gursoy and McCleary (2004), an increase in time cost to acquire information can cause tourists to look elsewhere. Destination marketers and managers need to understand that different tourists have different types of information needs (Gursoy & McCleary, 2004).

Vogt and Fesenmaier (1998) identified functional information as the most important type of information that tourists generally look for. Tourists collect and use information largely for functional reasons or to plan and take trips, but there are also other kinds of information needs.

Information needs vary based on the destination a tourist is travelling to. Travelling to a new destination without previous knowledge requires more information search as a tourist cannot use internal information about the destination

(Gursoy & McCleary, 2004). There are considerable differences between tourists in their information search behaviour based on their familiarity with the destination (Fodness & Murray, 1997) and tourists can also combine various available information sources (Fodness & Murray, 1999). There are also cultural differences that the marketers need to be aware of (Money & Crotts, 2003).

Pearce and Schott (2005) call for more detailed analysis of the booking and purchase behaviour of tourists to understand the distribution process from the visitors' perspective. Information search is connected to the decision-making process and often these topics are discussed together (Fodness & Murray, 1997).

2.2 *Destination Choice*

Information search leads to destination choice. Choice sets have been identified as a useful tool to analyse destination choice (Decrop, 2010). Decrop (2010) reviews earlier literature on the topic and presents a typology of seven choice sets. Using qualitative methods, Decrop (2010) demonstrates that choice sets are continuous and undergo turnarounds and that final destination choice is driven by constraints and opportunities. Destination marketers have the ability to affect consumer choice of destination through marketing and/or social environment. Tourists typically have zero to four destinations in their evoked sets that they then evaluate and choose from, unless marketers manage to introduce them to a new destination possibility during the information search process (Decrop, 2010). Decrop (2010) particularly mentions offers such as early booking or last-minute discounts as an excellent possibility for marketers.

Um and Crompton (1990) conceptualise travel destination choice as a two-stage process. First, a destination is added to an evoked set of destinations from an awareness set. Then a travel destination is selected from the evoked set as the travel destination based on a comparison of destinations in the evoked set.

Literature strongly suggests that Internet presence is something that destinations and tourism businesses have to focus on. For example, Castañeda, Frías, and Rodrígues (2007) argued that the more satisfied tourists are with a destination's Internet presence, the fuller his or her enjoyment is of the holiday. The more useful information a tourist can find, the more they can enjoy their holiday. According to Jalilvand and Samiei (2012), tourism destinations should focus on creating electronic word of mouth (eWOM) communication among tourists as eWOM has a significant impact on tourist attitudes towards visiting a destination, subjective norms, perceived behavioural control, and intention to travel. Also Wang (2015) argues that user-generated content (UGC) greatly affects consumers' decisions. Wang (2015) emphasises that UGC is an especially important information source for travellers to support their travel decisions, but Tham, Croy, and Mair (2013) state that we are still in an exploratory stage when it comes to investigating the influence of social media on destination choice.

Destination image has often been regarded as a critical component in explaining why tourists choose a certain destination. According to Baloglu and McCleary (1999) "human behaviour is reliant upon image rather than objective reality, which suggests that the world is a psychological or distorted representation of objective reality residing and existing in the mind of the individual". The World Tourism Organization defines image as "an aura, an angel, and a subjective perception accompanying the various projections of the same message transmitter" (Konecnik, 2004). Destination image has even been named the most influential component in consumers' destination selection (Ramkissoon, Nunkoo, & Gursoy, 2009; Tasci & Gartner, 2007) even though there is no consensus of an overarching approach to measuring destination image (Ramkissoon et al., 2009).

According to Di Pietro, Di Virgilio, and Pantano (2012), we need more research for tourism destinations and businesses to develop tourism marketing and communication strategies to influence tourists' behaviour in a more efficient way. They recommend that hospitality marketers should provide incentives for tourists to post online reviews, videos and photos, thus increasing their destination eWOM.

Wu, Zhang, and Fujiwara (2012) also state that a better understanding of tourists' destination choices is essential to successfully market and manage tourism. As tourists make various choices regarding their trip, including travel timing, travel company, duration, transportation modes and travel budget in addition to destination choice, researchers should attempt to integrate these factors more into destination choice research.

Sirakaya and Woodside (2005) reviewed earlier research concerning building and testing theories of decision-making by travellers. They state that tourism service offerings are often neglected in decision-making literature. Decision-making research in tourism does not reflect the unique characteristics of tourism services and researchers are trying to measure and understand a process that is unobservable and of which consumers are only partially aware. Nonetheless, travel marketers and destination developers need to understand how tourists make decisions (Sirakaya & Woodside, 2005). This helps them to develop effective marketing strategies.

To sum up the literature review, we already know quite well how a tourists' destination selection process works and how tourists search for information. The interplay between destination choice and information search is especially interesting as the literature suggests that online marketing affects information search and destination choice considerably, but we don't actually know how. Topics such as what marketing channels should be used and how are still under research. Pesonen (2013) states that the Internet is not only an information channel among others, but more detailed information on how people use the Internet for their travel decisions is required. Often in tourism, studies of quantitative information on which information channels tourists have used is obtained, but this information cannot be used to find out what information has affected their destination choice the most (Pesonen, 2013). This is true especially if we take into account that it becomes difficult for decision-makers to assign weights, derive values, and compute overall utility indices and have a rational, quantifiable reason for choices when there are many alternatives with various attributes (Um & Crompton, 1990; Park, 1978). For this

purpose, a qualitative and exploratory study was designed. The goal of the study was to gain information on how information search has affected their destination choice and how online marketing of a destination fits into this process.

3 Study Methods

The data was collected with semi-structured interviews which had some characteristics of structured interviews as well. The questions and themes were decided beforehand based on literature, but there was still opportunity for interviewers to slightly change the order or the wording of the questions or probe more in-depth answers if needed. Semi-structured interviews were used since it was an efficient way to collect open-ended data from dozens of travellers concerning their destination choice and still have somewhat systematic and comprehensive material. Large data was preferred to achieve as comprehensive an overall picture of the destination choice process as possible and achieve data saturation (Fusch & Ness, 2015). Semi-structured interviews were also a good way to reduce variety when several interviewers and languages were used. Semi-structured interviews also made it possible to compare the data in a rather systematic manner. (Eriksson & Kovalainen, 2008).

The interview questions were translated from English to Japanese and Russian. Before the translation process, the interview questions were discussed and commented on by the researchers at the Centre for Tourism Studies and tested with two randomly selected international travellers in the Savonlinna region. Only minor changes were made to the questions after testing. The research interviews were conducted in August 2016 by three interviewers, of which one was a native Japanese speaker and one a fluent Russian speaker. All the interviewers spoke fluent English. Interviews were conducted at five famous tourist attractions in the Savonlinna region in Eastern Finland. In total, 57 recorded interviews were conducted. To help to organise the data, the answers were also typed on an electronic form one question at a time. For the purpose of this research, only responses connected to the topic of this paper were transcribed.

The questions or themes concentrated on the decision-making process of international travellers. The questions were based on earlier literature summarised in the previous chapter. The aim was to discover the whole decision-making process from the initial consideration set to the late consideration set and all the way to the final selected destination (e.g., Crompton, 1992)—what affects the decision-making, what information channels are used and in what way, what is the importance of different information channels in the decision-making process, what is the time frame of this process and why travellers have finally ended up in Finland and moreover, in the Savonlinna region.

The data was analysed by using the Atlas.ti programme for qualitative data analysis. The analysis was built in a way that it would test the existing theories, which is characteristic of an extensive case study (Eriksson & Kovalainen, 2008).

The data was coded based on predefined propositions. In other words, the analysis was theory-based or deductive (Dudovskiy, 2016). Several codes regarding different information channels (internet, guidebooks, WOM etc.) as well as sub-categories for them were created in the process. The data was also analysed on the basis of which part of the decision-making process it represents and if the information search or decision-making was connected to destinations in general, to Finland, or to the Savonlinna region.

4 Results

Before turning to the results derived from qualitative data, we give a summary of the background of interviewed travellers since it might have an effect on the decision-making process and used information sources. For example, internet and social media are more commonly used by young travellers and their use also varies also between different nationalities. Further, since this was for most of the travellers the first visit to Finland, this might have an effect on the amount of information needed as well as used channels.

From the 57 international travellers that were interviewed, almost all were from Europe and only a few were from outside of Europe. From the German-speaking part of Middle Europe (Germany, Austria, Switzerland) came 14 of the interviewed travellers, 12 were from Mediterranean Europe (Spain, Italy), 10 from France, 7 from Russia, 3 from Nordic countries, 3 from Great Britain or Ireland, 3 from the USA, 2 from Japan, 2 from the Netherlands and 1 from Israel. The majority of them were male (64%) and the most common age groups were from 26 to 40 years old (38%) and from 41 to 55 years old (30%). For most of the international travellers, this was not only the first visit to Eastern Finland (83%) and the Savonlinna region (85%), but also the first visit to Finland (63%).

We asked the tourists first to state what destination or destinations they were visiting during this trip and what they considered as their destination during their current holiday. Mostly tourists preferred Finland as their current destination. Only three tourists mentioned only Eastern Finland and only five just the Savonlinna region. Most tourists were touring around Finland or Fennoscandia or were also visiting Russia or Estonia.

In the analysis of the data, it became obvious that most of the travellers planning a trip abroad have initially one or two potential destinations in mind when starting the decision-making process. This finding is rather similar to previous studies (e.g., Woodside & Lysonski, 1989). However, the number of potential destinations is rather small, many visitors only mentioned Finland. It seems that it is rather difficult for travellers to think back on the beginning of the process when they have already chosen the destination and are at the destination when answering these questions, although it was pointed out for them that we are only interested in the phase when they were making plans to go abroad.

When forming the structure of interviews, we decided to inquire more about the late consideration set that forms after the initial one, since the destinations in the late consideration set are those that a person genuinely thinks of as potential destinations in some given time (Crompton, 1992) and we were interested about their decision-making concerning the summer of 2016. Many travellers described this phase of the process through information search. It was common to initially find some information about competing destinations, but quickly most of the travellers started to concentrate their information search on Finland. In almost half of the discussions, the Internet was mentioned as at least one of the information sources when looking for more information to support their decision-making process, but word-of-mouth and surprisingly, also guidebooks were mentioned in at least one in five of the discussions in this initial process.

> We equally considered every country except India and looked for information. We looked for restaurants, hotels and hostels via internet, on Google and TripAdvisor, but mainly Google, and sightseeing places by Lonely Planet Italian language version. We mainly used internet, and additionally Lonely Planet.

> We bought the travel guide Le Routard in French. And our cousin gave more information… We found the information in our travel guide, for example, information about restaurants.

> We collected information from my friends, my network, and from the internet of which country would be easier to travel with kids, and everything.

The internet was mainly mentioned on a general level or just by mentioning the use of Google. Social media was brought up in only a couple of discussions and in those discussions, it was mentioned mostly related to looking for information about accommodation and things to do on TripAdvisor or www.booking.com. In three interviews, travellers mentioned using blogs or other travellers' diaries as a part of their decision-making. The most common and popular social media sites, Facebook and Instagram, weren't brought up in any of the discussions.

In this late consideration set, the travellers were mostly making the decision on the national level, in other words, comparing countries and not destinations within countries. However, we also wanted to know at which point they had started to consider Savonlinna (a small town in Eastern Finland) as a destination, and why and how did they find out what this region had to offer. The choice of the country is, according to our data, the starting point of a more in-depth information search in order to choose one or multiple destinations within the country. Also at this point, most travellers mentioned the internet as an important source of information, but the comments were more precise than previously. Many named websites that they had used to make the decision of whether or not to come to the Savonlinna region. Google was still mentioned as one of the most important starting points of the information search, but many travellers also mentioned some Online Travel Agency website (mainly www.booking.com or TripAdvisor) or websites of the National Tourism Organisation www.visitfinland.com. However, only few mentioned that they had used the website of Savonlinna Destination or the website of the city of Savonlinna. This can be interpreted in two ways, either the travellers of these days

count mainly on national level marketing material on the internet, Google and OTAs or they do not pay attention to which websites they visit during the decision-making process.

> According to an internet search, Savonlinna is a must-see place in Finland as it has beautiful lake land and sights, and the castle.

> Internet. I think it was probably "www.visitfinland.com" and other sites in French. My father looked up TripAdvisor too.

Not too many travellers referred to social media even at this point in their decision-making, the few ones that mentioned using some form of social media mostly talked about comparing hotels and attractions on www.booking.com or TripAdvisor. Only three of the travellers mentioned using blogs or other travellers' diaries when considering the Savonlinna region as their potential destination.

> We searched on the internet to find out if there was any similar route that had been taken by other tourists. We saw that probably the part with the lake is the best part to visit in the summer, so we decided to plan a tour with a car.

Although social media was not that widely used, the traditional word-of-mouth seemed to have a big effect on the decision-making process of many travellers when finding out what to do and where to visit in Finland. For many it was friends, relatives or colleagues that gave the first push to even start to consider the Savonlinna region as a destination. And after that the focus turned to other information channels. Guidebooks were also and even more often used at this point (than earlier points) when looking for possible destinations in Finland and more in-depth information about destinations.

> After the suggestion from my friend, I learned more about Savonlinna from a travel guide book.

The data suggests that the reason for both starting to consider and actually travelling to Savonlinna all come down in the end to recommendations. Most of the travellers shared that they had ended up in Savonlinna because of the recommendation of a guidebook, a friend, relative or a colleague, or the recommendation of www.visitfinland.com. The importance of electronic word of mouth that is assumed in most of the recent literature, does not show through in this data.

Quality is the keyword when it comes to websites of destination or individual businesses. The travel decision-making process is seen as having a higher risk associated with it than many other decision-making processes (e.g., Crompton & Ankomah, 1993). It is important to be able to reduce that risk and that can be done by offering plenty of accurate, useful, and practical information for travellers.

> One argument was that organising this [trip] by using the internet was easier than [going to visit] archipelago[another destination in Finland]. Oravi (district of Savonlinna) is well organised compared to other companies. I did not want to contact ten different destinations, so well organised web pages seal the deal.

In former theories of destination decision-making, an action set is mentioned as one of the steps in the decision-making process. This means that the destinations

that are contacted during the decision-making process have a higher probability to end up as the final selected destination. Our research does not support this idea. In the era of internet and Web 2.0 it seems more important that the traveller can get all the needed information from different sources, primarily from the internet. If the websites do not offer enough information or the information is too hard to get, the traveller might change his destination. Only a couple of travellers contacted companies or destinations before making the decision about their destination. It was more common to contact the companies after the decision was already made. One traveller even said that

> Actually I got the confidence to come here since there was the possibility to book online and I could check the availability every now and then. We planned our own routes by ourselves. For me it is important that I can plan and book everything by myself without the necessity to contact anyone.

5 Discussion and Conclusions

The results of this study provide interesting information for destinations and businesses especially regarding online marketing to international tourists. First of all, destinations and businesses should really know their customers, not just the channels they use (Pesonen, 2013) but also how exactly are they using these information search channels. Qualitative interviews used in this study provide in-depth understanding of the information search and decision-making process of tourists. The results emphasise the fact that destination marketers need to know what the destination is that their customers are visiting. In this case the destination was not Savonlinna, nor was it the Saimaa region or Eastern Finland. The majority of the international tourists interviewed for this study regarded Finland as their destination. They had chosen Finland as their destination based on the image of Finland and then they started thinking about what they can do while they are here.

According to this data, for the DMO, it seems important to concentrate at this point on visibility in search engines and collaboration with a national tourism organisation. It is also important for destination management organisations to pay attention to the quality of services as well as the quality of websites of the tourism businesses in the region. The results suggest that a good website is not enough to ensure that a tourist comes to the destination or visits a business, but a bad website guarantees that a tourist chooses another destination or company.

There are around 60 destination management organisations in Finland and almost a dozen in Eastern Finland (http://www.visitfinland.com/destinations/). The results demonstrate that these are supply-based organisations instead of demand-based organisations. Every international tourist interviewed in this study was on a trip that included destinations in various parts of Finland as well as destinations in Russia, Estonia, Sweden and Denmark. DMOs should work with each other to create products that are interesting for tourists. Focusing only on the

tourism services in the geographically limited operating area of a DMO makes it more difficult to create experiences that tourists really want and need. DMOs need to stop focusing on geographically limited regions, especially regarding international tourists, as it limits the competitiveness of the destination. Tourists are not geographically bound to a single destination (Beritelli, Bieger, & Laesser, 2014) and neither should organisations that cater to tourists' needs.

Since the word-of-mouth has such a big role in the decision-making process it is important to take good care of travellers and ensure a high level of services. This also naturally applies to electronic word-of-mouth. Although not so many travellers mentioned that they would have used UCG, it is fairly hard to avoid it these days as there are reviews and comments in TripAdvisor and nearly all the other OTA websites. A tourist comparing, for example, accommodation on the internet easily comes across UCG. Also Xiang and Gretzel (2010) point out the importance of UGC in search engine visibility. Tourism businesses need to be particularly aware of their search engine visibility among international tourists and know the key words that tourists use to find more information about their holiday. Customers are already moving to the direction where they do not want to contact the business they are going to visit. Online booking possibility must be a priority in online marketing. It also enables much more detailed conversion analytics than just e-mail reservation or phone calls, often used by businesses in the Savonlinna region.

Theoretically this study contributes to the interplay of information search and destination choice in tourism, deepening our understanding of how tourists choose the destination they are visiting. Internal information search seems to play a greater role when tourists are placing destinations into their consideration set (Decrop, 2010) and online marketing of destinations is crucial when tourists are choosing the destination from an evaluation set. Efficiently conducted online marketing and online visibility decreases the likelihood that consumers change the destination into something else when they are searching for information to make their destination choice. Functional information especially (Vogt & Fesenmaier, 1998) still seems to be in the forefront of tourist information search.

This study is one of the few studies that collect data on tourist information search and decision-making using qualitative research methods in the destination during the holiday of an international tourist. This research method also increases our understanding of the topic as it is studying the actual behaviour of the tourists, not just intention to visit.

Altogether, 57 interviews were collected. This is quite a lot for qualitative research, but a considerable number of interviews were required as the topic was multidimensional and tourists came from many different cultures. Data collection was stopped when data started to saturate. One source of error in this study are translations. Interviews were conducted by three researchers in Japanese, Russia and English and the data was translated by each researcher. However, great attention was paid to ensure that everyone understood the research objectives and research methods and interviews were also recorded to ensure that all possible errors could be double-checked later on if needed.

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Channels for Searching Hotel and Travel Information

Sunny Sun, Rob Law, Chris Luk and Lawrence Hoc Nang Fong

Abstract Tourists are increasingly relying on different channels to search for hotel-related and travel-related information. However, the gravity of importance and the performance of these channels are not clear. Thus, this study evaluates the importance and performance of these channels and identifies the factors that affect the use of these channels. The findings indicated that tourists regard international online travel agencies as the most important channel for searching hotel information. By contrast, they regard social media sites as the most important channel for searching travel-related information. Significant differences were found in the web search skills and information search behaviour of tourists. The results can provide practical implications for hotel and tourism practitioners in targeting tourists more accurately.

Keywords Channels · Hotel and travel information · Information search · Behaviour

1 Introduction

Information search behaviour has gained considerable attention from hotel and tourism researchers because it plays a vital role in the purchase decision-making process of tourists (Jang, 2004). Being informed of the information search beha-

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viour of tourists is crucial for hotel and tourism marketers and tourists. Marketers should understand the travel decisions of tourists when selecting destination, accommodation, transportation, and activities. In particular, they must know the channels tourists use in searching for relevant information in the early stage because the retrieved information can significantly influence their decision making (Law & Hsu, 2006; Lo, Cheung, & Law, 2002). From the perspective of tourists, the channels used for searching hotel and tourism information are effective tools that allow them to acquire the required information.

Indeed, the rapid development of Internet technology to general business has also led to its wide application in the hospitality industry. During the mid-2000s, Law and Hsu (2005) pointed out that hotels have largely adopted e-commerce to achieve different business goals. Similarly, tourists have increasingly been using the Internet to search for hotel-related and travel-related information through a large number of channels (Law & Hsu, 2006). For example, Expedia has more than 13.4 million monthly visitors as of September 2014. Expedia announced that it will extend its distribution programs in the first half of 2015 (Forbes, 2015). Social media platforms, such as social networking sites (e.g., Facebook, TripAdvisor) and photo/video sharing sites (e.g., Flickr), also affect the travel planning of tourists in terms of information provision (Xiang, Magnini, & Fesenmaier, 2015).

Previous studies have showed that the information search behaviour of tourists is affected by their past experience and social demographic factors, particularly gender (Kim, Lehto, & Morrison, 2007; Kim & Kim, 2004). For example, Kim et al. (2007) discovered that gender has been and continues to be one of the most common factors for market segmentation. Previous studies have also indicated that online information searchers are young, predominantly male, and well-educated (Kim et al., 2007; Xiang et al., 2015). In essence, if travellers do not search a website, it is not possible for them to purchase the products. Hence, web search skills are also considered important factors that affect the information search behaviour of tourists. Feufel and Stahl (2012) showed that most participants stopped conducting search once they found the first piece of required information. Limited studies investigated the relationship between web search skill and the information search behaviour of tourists; however, this behaviour may indicate that tourists select different channels of information sources (Mäntymäki & Salo, 2013). Travellers need to search for information when making travel decisions, in contrast to when purchasing other products and services (Lo et al., 2002). At present, tourists use a variety of online and offline channels to search for hotel-related and travel-related information. However, the gravity of importance and the performance of these channels remain unclear. Thus, the objectives of this study are to identify the importance and performance of these channels in searching hotel-related and travel-related information, then to investigate the factors that affect the use of these channels and to examine the relationship between web search skill and information search behaviour based on the adjustment of previous research framework.

2 Literature Review

2.1 Channels for Searching Hotel-Related and Travel-Related Information

The rapid development of the Internet has fundamentally reshaped the way information is distributed and the way travellers search for travel information (Buhalis & Law, 2008). The channels for searching relevant information have three general types, namely, offline channels or destination promotion web sites (e.g., U.S. Travel and Tourism Advisory Board), Online Travel Agents [OTAs] (e.g., Expedia.com), and social media sites (e.g., TripAdvisor). Offline channels, such as U.S. Travel and Tourism Advisory Board, provide official information related to food, transportation, and attraction. OTAs are popular online travel agencies that act as intermediaries in selling travel-related products. For example, Expedia is one of the largest and most important international OTAs (Tso & Law, 2005). Leung, Guillet, and Law (2014) showed that, with the popularity of e-commerce application, more travellers use OTAs to search and purchase travel products. Regional OTAs, such as the website of China National Travel Service, also play a role in selling travel-related products. However, these sites are restricted to serving certain regions. Social media sites include various forms of tourist-generated content (CGC), such as social networks and collaborative tagging; social media sites are widely applied in the online information search of tourists and in information sharing (Buhalis & Law, 2008; Xiang et al., 2015).

At present, many tourists prefer to use online channels to search for hotel information instead of offline channels (Wong & Law, 2005); however, Schegg et al. (2013) indicated that direct hotel bookings are the dominant sales tools in Switzerland. By analysing the ratings of all hotels in Hong Kong, Denizci Guillet and Law (2010) found a total of 11 distribution websites. Leung et al. (2014) compared the hotel room prices offered by different OTAs, and found that no single online channel outperforms the others. Although a large number of channels are available for searching hotel-related and travel-related information, studies that investigate their importance and performance are limited. For instance, Miller (2004) investigated different OTAs and found that they can be located by using the keyword "travel." By contrast, hotel websites do not occupy a large percentage of the returned results. Chen (2012) investigated the most popular OTA websites in China. His findings indicated that the information provided by OTAs is not accurate. One example is the display of wrong hotel photos. The popularity of different types of channels is obvious. However, the gravity of importance and the performance of these channels remain unclear at this stage. By being informed of the channels tourists use to search information, marketers can target consumers more directly and accurately, which may ultimately contribute to the revenues of hotel and tourism stakeholders (Lorenzo & Law, 2015).

2.2 Factors that Affect the Use of Different Channels

The use of diverse channels to search for hotel and tourism information has become a common practice. Previous studies have listed some external and social demographic factors that affect the information search behaviour of tourists. Wong and Law (2005) found that information quality and time/availability affect the online hotel room purchase intention of tourists. Moreover, the perceived price is also an important factor that affects tourists' selection of different channels for searching relevant information (Chiang & Jang, 2007). Furthermore, ease of finding could be a factor that influences the channel choice of customers (Miller, 2004). Jun, Vogt, and MacKay (2007) investigated the relationship between travel information search and travel product purchase in pre-trip contexts. The findings indicated that past experiences influence travel information search and product purchase. In terms of socio-demographic factors, the findings of Kim et al. (2007) showed that males and females are likely to differ in terms of information search and decision making, indicating that gender is one of the most important factors used to segment hotel and tourism markers. Furthermore, generation Y travellers are more active in seeking information from a variety of sources, such as social media, during their travel planning. They also exhibit a higher usage rate of OTAs (Xiang et al., 2015).

Previous studies have shown a variety of factors that affect the use of channels on the information search of tourists. However, limited studies have investigated the impact of factors, such as web search skill and the time spent on the Internet, on the information search behaviour of tourists. Hölscher and Strube (2000) revealed that web experts can make use of advanced search options, such as modifiers, more frequently than the average user. In terms of web search technique, the findings of Feufel and Stahl (2012) showed that skilled web users can effectively filter information according to their search intentions. By contrast, less-skilled users can be easily distracted by other unrelated information. Wong and Law (2005) investigated the impact of time/availability on the information search behaviour of tourists; however, the relationship between the time spent on the Internet and the channels tourists use to search information remains unknown. Considering that web searchers are heterogeneous and their capabilities affect the ease of finding information sources and the preference of diverse channels, the present study investigates the impact of other factors (e.g., web use skill) on the channels tourists use, apart from previously investigated factors.

2.3 Theoretical Framework

Three major theoretical streams can be identified from the information search behaviour of tourists: the psychological/motivational approach (Schmidt & Spreng, 1996), the economics approach (functional approach) (Bloch, Sherell, & Ridgway, 1986), and the tourist information processing approach (Vogt & Fesenmaier, 1998).

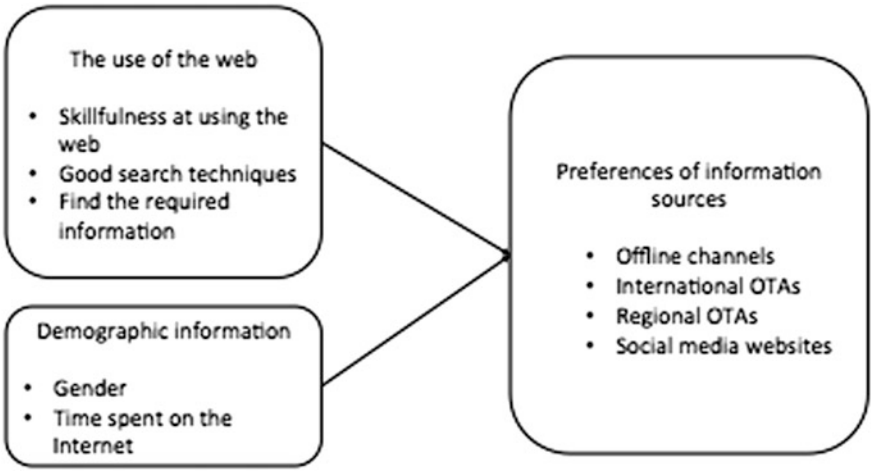

Fig. 1 Theoretical framework

These theories mainly deal with motivational factors. However, Liu and Zhang (2014) argued that if tourists do not even search on a website, they cannot possibly purchase any product on a website. Thus, based on the study adapted from Luo, Feng, and Cai (2004), the present study investigates the impact of web search skill on the information search behaviour of tourists, along with the important demographic information on gender (Fig. 1).

3 Method

3.1 Data Collection and Analysis

A questionnaire survey was conducted in this study to investigate tourist behaviour when using different channels to search for hotel-related and travel-related information. First, a pilot test was conducted recently in an international tourist destination in Asia. The draft questionnaire consists of two sections. The first section includes questions related to search behaviour toward hotel guest information. The questions were also related to the channels of online information search, such as offline channels, OTAs, and social media sites. The second section contains socio-demographic information about gender and household income. Actual data collection was conducted after the pilot test using questionnaire survey. Convenience sampling was adopted in the present study. To be specific, data were collected from the adult residents in a major tourist destination in Asia. The respondents were verbally advised by one of the authors in terms of the purpose of the survey before filling in the questionnaires. As stated in the cover page of the

questionnaire, participation in the survey was completely voluntary. A total of 161 questionnaires were received, among which, 141 were valid for further data analysis. Paired samples t-tests are initially applied to test the significant differences between the importance and performance of the channels for searching hotel-related and travel-related information. Independent samples t-tests are used to examine the relationship between web use skills and hotel-related and travel-related information search behaviour, respectively. One-way ANOVA is conducted to investigate the time spent on the Internet and the use of different channels to search for hotel-related and travel-related information.

3.2 Binary Logit Model

Apart from the aforementioned methods, binary logistic tests are conducted to investigate the factors that affect the use of different channels to search information. The binary choice models were chosen because of maximum likelihood estimation, which treats each observation as a single draw from a Bernoulli distribution (Greene, 2011). In other words, the model with success probability F (x′ β) and independent observations can be considered as joint probability. The formula is indicated below:

$$\text{Prob}\left(Y_1 = y_1, Y_2 = y_2, \ldots Y_n = y_n | X\right) = \prod_{y_i=0} \left[1 - F(X_i' \beta)\right] \prod_{y_i=1} F(X_i' \beta) \quad (1)$$

where X denotes [xi] i = 1,…,n. The likelihood function for a sample of n observations can be conveniently expressed as

$$L(\beta|\text{data}) = \prod_{i=1}^{n} \left[F(X_i'\beta)\right]^{y_i} \left[1 - F(X_i'\beta)\right]^{1-y_i} \quad (2)$$

In the present study, [xi] i = 1,…,n refers to independent variables. These variables include skillful in using the web, good search techniques on the web, and capability of finding required information. These factors affect the use of different channels to search information. Probability F (x′ β) denotes the use of different channels.

4 Findings and Discussion

4.1 Social Demographic Information

In reference to the social demographic information of the respondents, the results showed that only 5% of the respondents use the Internet for less than 5 h per week.

Moreover, almost half of the respondents (46.8%) use the Internet from 5 to 20 h. In addition, 48.2% of the respondents use the Internet from 21 h to more than 30 h. In terms of gender, nearly 85 (60%) of the respondents are female, whereas the remaining 56 (40%) are male. In terms of the monthly household income of the respondents, more than 60% have a monthly household income of USD 1350 or less to USD 2700 to USD 4050. The remaining 40% of the respondents have a monthly household income from USD 4050 to 5400 to USD 8100 or more.

4.2 *Importance and Performance of Information Search Channels*

Table 1 provides the mean value of the importance and performance of using different channels to search for hotel information. The value ranges from 1 (very low) to 5 (very high). Among these four channels, the importance of international OTAs is perceived the highest ($M = 4.11$). Compared with international OTAs, social media sites ($M = 3.93$), using offline channels ($M = 3.39$), and regional OTAs ($M = 3.31$) to search for hotel information is not as important as these channels. In terms of the performance of these channels, it is also international OTAs, which rank the highest ($M = 3.97$), whereas regional channels rank the lowest ($M = 3.31$). Significant differences were found in international OTAs ($p < 0.01$). Although international OTAs are perceived as important, they do not live up to tourist expectations.

Table 2 shows the mean value of the importance and performance of different channels when searching for travel-related information. The findings showed that social media sites (M = 4.10) have the highest degree of importance, whereas that of regionals is perceived the lowest (M = 3.52). A similar trend is found in terms of the performance of these channels. The performance of social media sites ranks the highest (M = 4.10), whereas that of regional channels ranks the lowest (M = 3.45). In summary, a significant difference was found between the importance and performance of the use of offline channels for searching travel-related information

Table 1 Channels for searching hotel information

Channels for searching hotel information	Importance (mean)	Std. deviation	Std. error mean	Performance (mean)	Std. deviation	Std. error mean	P
Offline channels	3.39	0.960	0.094	3.33	0.939	0.092	0.365
International OTAs	4.11	0.748	0.065	3.97	0.709	0.062	0.009
Regional OTAs	3.31	0.946	0.096	3.31	0.842	0.085	1.000
Social media sites	3.93	0.818	0.072	3.84	0.833	0.073	0.128

Table 2 Channels for searching travel-related information

Channels for searching travel-related information	Importance (mean)	Std. deviation	Std. error mean	Performance (mean)	Std. deviation	Std. error mean	P
Offline channels	3.67	0.906	0.088	3.54	0.931	0.091	0.032
International OTAs	3.84	0.852	0.082	3.78	0.854	0.082	0.145
Regional OTAs	3.52	0.861	0.085	3.45	0.837	0.082	0.260
Social media sites	4.10	0.859	0.076	4.01	0.808	0.071	0.134

($p < 0.05$). Compared with other channels, offline channels are not as important as these channels. However, these channels do not perform as well as tourists expect. No significant differences were found between the importance and performance of other channels, except offline channels, in searching for travel-related information.

By using paired samples t-test, a significant difference ($p < 0.01$) was found in the use of international OTAs to search for hotel-related and travel-related information. The results showed that tourists are more likely to use international OTAs to search for hotel information. Moreover, a significant difference ($p < 0.01$) is found in the use of offline channels. The findings revealed that tourists are more likely to use offline channels to search for travel-related information. Based on such finding, tourists regard international OTAs as important channels for searching hotel information even if they do not perform as well as tourists expect. Hence, international OTAs should enhance their performance in terms of e-service quality (Fu Tsang, Lai, & Law, 2010). Given that tourists show their preferences in using international OTAs to search for hotel information, hotels can distribute hotel room quota or put more hotel information on international OTAs to gain more exposure among tourists. By contrast, given that tourists are more likely to use social media sites to search for travel-related information, such approach may be a good way to put more travel-related information on social media sites, such as Facebook and TripAdvisor. Regional OTAs have the lowest importance and performance compared with other channels. Thus, to improve performance, regional OTAs should improve the provision of hotel-related and travel- related information.

4.3 Factors that Affect the Use of Different Channels to Search Information

A binary logistic test was conducted to identify the factors that affect the use of different channels to search related information. Table 3 provides information on the factors that affect the use of offline channels to search information. A significant difference is found between skillfulness of using the web and the use of offline

Table 3 Factors that affect the use of offline channels to search information

Factors that affect the use of offline channels to search for hotel information				Factors that affect the use of offline channels to search for travel-related information			
	B[a]	Sig[b]	Exp (B)		B[a]	Sig[b]	Exp (B)
Skillful at using the web	1.151	0.034	3.161	Skillful at using the Web	0.428	0.380	1.534
Good search techniques on the web	−0.706	0.190	0.493	Good search techniques on the Web	−0.890	0.110	0.411
Capability of finding the required information	0.555	0.512	1.743	Capability of finding the required information	1.083	0.043	2.954

Note a = Binary logistic coefficients; b = Significant levels for each coefficient

channels to search for hotel information ($p < 0.05$). In other words, skillfulness of using the web is an important factor that affects the use of offline channels to search for hotel information. The findings are partly consistent with that of Feufel and Stahl (2012). The skillfulness of users affects the use of different channels to search information. Significant differences were found in the capability of finding the required information and the use of offline channels when searching for travel-related information ($p < 0.05$). Unlike the factor that affects the use of channels to search hotel information, the capability of finding required information is an important factor that affects the use of offline channels to search for travel-related information.

Table 4 shows the factors that affect the use of social media to search for relevant information. A significant difference is found between skillfulness at using the web and the use of social media sites to search for hotel information ($p < 0.01$). The results partly agree with that of Hölscher and Strube (2000). This finding shows that web experts can make use of advanced search options more frequently than the average user. Social media sites contain a large amount of information; thus,

Table 4 Factors that affect the use of social media to search information

Factors that affect the use of social media to search for hotel information				Factors that affect the use of social media to search for travel-related information			
	B	Sig	Exp (B)		B	Sig	Exp (B)
Skillful at using the web	−1.137	0.005	0.321	Skillful at using the Web	−0.878	0.029	0.416
Capability of finding the required information	−0.694	0.067	0.500	Capability of finding the required information	−0.822	0.036	0.439

Note a = Binary logistic coefficients; b = Significant levels for each coefficient

tourists can perform advanced search to filter information (Xiang & Gretzel, 2010). The findings also revealed that skillfulness at using the web ($p < 0.05$) and capability of finding the required information ($p < 0.05$) are important factors that affect the use of social media to search for travel-related information.

No significant differences are found between the factors and the use of international OTAs and regional OTAs to search for hotel-related and travel-related information. In conclusion, being skillful at using the web is an important factor that affects not only the use of offline channels to search for hotel information, but also the use of social media to search for hotel information. Other factors, such as the capability of finding the required information, affect the use of offline channels in searching for travel-related information.

4.4 Web Use Skill and Information Search Behaviour

Independent samples t-tests were conducted to test the relationship between web use skill and hotel information search behaviour. As shown in Table 5, significant differences are found between web use skill and different types of channels. Specifically, significant differences are found among skillfulness at using the web ($p < 0.001$), good search techniques on the web ($p < 0.01$), and capability of finding required information ($p < 0.01$) compared with the use of offline channels. Surprisingly, tourists who have not used offline channels and who have previously thought themselves as skillful in using the web have good web search techniques and are capable of finding required information. A significant difference is also found between skillfulness in using the web and the use of international OTAs ($p < 0.01$). Tourists who have used international OTAs previously regarded themselves as skillful in using the web. No significant difference is found between

Table 5 The relationship between web-using skill and hotel information search behaviour

Hotel information search behaviour	Offline channels		International OTAs		Regional OTAs		Social media sites	
	Df	F	Df	F	Df	F	Df	F
Skillful at using the web	140	8.656***	140	7.620**	140	1.053	140	2.884
Good search techniques on the web	140	7.954**	140	0.134	140	0.882	140	0.982
Capability of finding the required information	140	10.538**	140	3.180	140	0.726	140	3.881
Gender	140	0.000	140	5.652*	140	1.724	140	0.238

Note *p < 0.05; **p < 0.01; ***p < 0.001

these skills and the use of regional OTAs and social media sites. In terms of gender, a significant difference is found in using international OTAs to search for hotel information ($p < 0.05$). Luo et al. (2004) pointed out that tourist demographic characteristics and information search behaviour are closely related. The findings of this study also showed that compared with males, females are more likely to use international OTAs to search for hotel information.

Table 6 shows the relationship between web use skills and travel-related information search behaviour. Significant differences are found between skillfulness in using the web ($p < 0.05$) and the capability of finding the required information ($p < 0.05$) compared with the use of offline channels to search for travel-related information. Tourists who have not used offline channels believe that they are skillful at using the web than those who have. No significant differences are found between web-using skills and international OTAs, regional OTAs, and social media sites. However, significant differences are found between gender and the use of different channels. Specifically, significant differences are found in gender and regional OTAs ($p < 0.01$), and social media sites ($p < 0.05$) respectively. Compared with males, females are more likely to use regional OTAs to search for travel-related information. However, they are not likely to use social media sites. The findings are consistent with that of Luo et al. (2004). Gender is significantly related to tourists' selection of information sources.

One-way ANOVA tests were conducted. A significant difference $F(5, 136) = 3.723$, $p = 0.007$ is found between the time spent on the Internet and the use of social media to search for hotel information. Tourists who spend 2–5 h on the Internet are more likely to use social media to search hotel information compared with those who spend more than 30 h. Similar results are found between the time spent on the Internet and the use of social media to search travel-related information.

Table 6 Relationship between web-using skill and travel information search behaviour

Travel information search behaviour	Offline channels		International OTAs		Regional OTAs		Social media sites	
	Df	F	Df	F	Df	F	Df	F
Skillful at using the web	140	5.248*	140	2.23	140	0.923	140	3.618
Good search techniques on the web	140	3.781	140	0.362	140	0.479	140	0.233
Capability of finding the required information	140	8.236**	140	0.181	140	0.473	140	1.682
Gender	140	1.346	140	2.237	140	7.498**	140	4.832*

Note *p < 0.05; **p < 0.01; ***p < 0.001

5 Implications

5.1 Theoretical Implications

Travellers are increasingly becoming dependent on diverse channels to search for hotel-related and travel-related information. However, the gravity of importance and the performance of each of these channels are not clear. Thus, the present study evaluated the importance and the performance of these channels to enrich and update the literature. In addition, previous studies have identified the impact of factors such as past experiences on the information search behaviour of tourists, the findings of the present study extended previous studies by adding factors such as web search skill and the time spent on the Internet to the framework of online information search behaviour. Furthermore, the present study contributes to the hospitality and tourism by providing a comprehensive understanding of the channels that tourists prefer for hotel-related and travel-related information search.

5.2 Practical Implications

In terms of the different channels used to search for hotel—and travel-related information, the findings showed that tourists regard international OTAs as the most important channel. However, despite the fact that international OTAs are perceived as important channels, their performance cannot fully meet tourist expectations. Given that travellers regard international OTAs as important, international OTAs should improve their performance in terms of e-service quality. Regional OTAs have the lowest importance and performance among tourists. Hence, regional OTAs should improve the provision of information by learning from international OTAs to facilitate competitiveness. Previous studies have identified factors, such as perceived price, that affect the information search behaviour of tourists. The present study mainly examined the factors (i.e., web-search skill) that affect the use of different channels when searching for hotel-related and travel-related information. Such factors have not been examined in the past. The findings indicated that skillfulness of using the web and the capability of finding the required information are important factors that affect the use of offline channels to search for hotel-related and travel-related information, respectively. By using the above evidence, hotel and tourism practitioners can target the market more precisely. On the other hand, the relationship between the time spent on the Internet and the information search behaviour of tourists shows that tourists who spend 2–5 h on the Internet are more likely to use social media sites to search for hotel-related and travel-related information than those who spend more than 30 h. In other words, tourists who use the social media to search for hotel and travel-related information are the ones who are targeted more compared with those

who use social media sites for other purposes, such as social networking. Thus, hotel and tourism websites can highlight hotel and tourism information for tourists on social media sites, such as an appealing short video on the browsing page.

6 Conclusions and Future Research

The Internet, which acts as a new media platform, affects the provision and acquisition of information in the hotel and tourism industry (Luo et al., 2004). The findings of the present study indicate that tourists perceive international OTAs as the most important channels in searching for hotel-related and travel-related information. By contrast, tourists perceive regional OTAs as least important. Moreover, the web use skills of tourists significantly affect the use of different channels to search for hotel-related and travel-related information.

Based on the above evidence, hotel and tourism practitioners can improve the performance of international OTAs to satisfy the needs of tourists. As Xiang and Gretzel (2010) argued, social media sites largely affect the travel information search behaviour of tourists. Thus, highlighting information on social media sites can enhance information exposure among tourists. This study further confirms that social media sites are popular for hotel information search. Hence, highlighting information by putting appealing short videos may be an effective way to attract tourists. One limitation of this study is its limited sample size. Future research can expand the sample size and extend the study to other countries and regions for comparison purpose.

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Part VII
Consumer Profiling

The Role of Humour in Driving Customer Engagement

Jing Ge and Ulrike Gretzel

Abstract Customer engagement is seen as a central measure of marketing effectiveness on social media; yet, very little is known about the factors that drive it. This research focuses on message characteristics and more specifically the role of humour in encouraging likes, comments and reposts. Based on a sample of firm-initiated Weibo posts by a Chinese provincial destination marketing organization, it investigates whether humorous messages are more effective. In addition, it also considers whether a message contains a product focus and is complex in terms of its length, lexical density and inclusion of multimodal elements. The findings confirm the proposed influence of humour but suggest an even stronger impact of non-product related contents and also indicate that the message factors modelled only account for about 25% of the variance of customer engagement.

Keywords Humour · Social media · Customer engagement · Product focus · Message complexity

1 Introduction

Humour—a means of providing pleasure, initiating social interactions and generating affective responses from an audience (Meyer, 2000)—has been found to enhance marketing communication efforts. It can assist marketers to advertise and promote their products and services because marketing messages presented in an interesting way draw consumer attention, increase message comprehension and contribute to positive attitudes toward these messages (Eisend, 2011). Marketers

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can further use humour to disclose difficult information and establish rapport by entertaining consumers (McGraw, Warren, & Kan, 2015). Humour in marketing has been found to assist in developing a well-regarded brand image and building strong relationships with consumers (Speck, 1990). Humour further helps with initiating interactions with both familiar and unfamiliar audiences (e.g. existing and potential customers) (Lynch, 2002). The reason is that it is capable of influencing a person's positive affect, invoking solidarity and creating affiliation (Meyer, 2000). This capability of humour to initiate social interactions makes it potentially a very powerful tool in the context of social media marketing.

Humour has been researched to some extent in tourism marketing and has been found to be especially effective in the tourism context due to the hedonic nature of tourism products (Pearce & Pabel, 2015). The tourism literature identifies several advantages of using humour in tourism marketing: Consumers tend to concentrate more on tourism marketing messages involving humour (Pearce & Pabel, 2015). Humorous tourist postcards and brochures are more likely to be disseminated. Destinations presented in humorous advertising can generate more discussion among tourists and increase tourists' willingness to visit the destination (Pearce & Pabel, 2015). However, research has yet to explore tourism-related humour in the context of social media marketing. Humour structure and use capabilities and conventions on social media differ from those in traditional media. The technological basis of social media not only accommodates humour morphologies facilitated by traditional media, but also affords new ones (Shifman, 2012). Findings from previous studies on the effectiveness of humour in marketing can therefore not necessarily be directly transferred to the social media context.

The effectiveness of social media marketing efforts is typically judged by the level of customer engagement achieved. Humour on social media is inherently associated with sharing (Shifman, 2012). Marketing posts involving humour are ranked as the top reason that consumers are willing to interact with firms on social media (Nielsen, 2015). Importantly, marketing promotions on social media through humour can generate large amounts of reposts in a short time period (Northrup, 2015). Although the effectiveness of humour in digital contexts is generally assumed to be high (Shifman, Coleman, & Ward, 2007), evidence derived from systematic, empirical research is generally lacking. To fill this literature gap, this research aims at answering the following question: What is the relative importance of humour in driving customer engagement with tourism marketing messages on social media?

2 Theoretical Foundations

2.1 Customer Engagement Metrics

In the context of social media marketing, the ultimate goal is to encourage customers to enter a conversation (Solis, 2010; Gretzel & Yoo, 2013). Customer

Table 1 Social media metrics (adapted from Coelho et al., 2016)

Primary Metrics	Description
Liking	Endorsing firm-initiated posts Visible on firm's social media page
Commenting	Adding information to firm-initiated posts Structuring firm-customer conversation by either maintaining, challenging or redirecting Visible on firm's social media page
Reposting	Spreading firm-initiated posts Expanding firm-customer conversation Visible on firm's social media page and on customer's personal page

engagement has therefore emerged as an important concept in determining the effectiveness of social media marketing efforts, including in tourism (So, King, & Sparks, 2014). Customer engagement is defined as the sum of customers' behavioural manifestations that have a firm focus, reach beyond purchase-related interactions and are the result of strong motivational drivers (Van Doorn, Lemon, Mittal, Nass, Pick, Pirner, & Verhoef, 2010). Customer engagement is typically measured using likes, comments and shares (Coelho, Oliveira, Almeida, & O'Connor, 2016). Table 1 provides further information on the metrics. Liking is a way through which consumers react to firm-initiated posts—it not only shows that customers recognise and approve the firm-initiated posts, but also gives credibility to such posts (Ge, Gretzel, & Clarke, 2014). Commenting is a means through which consumers offer their own commentary to postings by adding new content (Boyd, Golder, & Lotan, 2010). Comments can help the firm maintain conversations but also give consumers the power to structure the conversation. Reposting is a channel through which consumers can spread firm messages, resulting in consumer conversations with an extended reach and enhanced interactivity (Boyd et al., 2010). This means that reposting implemented by customers can expand the audience beyond those viewing a firm's corporate social media page.

Although *liking*, *reposting* and *commenting* are all well-regarded social media metrics, they are not equally valuable. A large number of "likes" are only of value if they represent genuine connections (Gretzel & Yoo, 2013). Unfortunately, "likes" are often acquired during firms' promotional efforts and do not mean that the consumers actually appreciate and engage with the marketing posts. For instance, consumers may like firm-initiated posts only for the purpose of receiving an award such as a discount. Comments are the most cognitively and behaviourally demanding form of engagement, because consumers need to read and process the marketing posts and then provide information and/or their opinions. On one hand, comments allow tourism marketers to gain consumer insights and market intelligence. On the other hand, their potential adverse effects cannot be ignored: Consumer comments can include statements that are completely irrelevant to the marketing posts. Even worse, consumers may publishneeds in order to foster aggressive comments that can

undermine the communication efforts of the firm. Reposts disseminate the original marketing message to a wider consumer audience and are therefore usually seen as the most important form of engagement for marketers (Boyd et al., 2010). Consequently, to more effectively measure firm-customer interactions, weighted engagement metrics are typically used (Margetts, 2013).

2.2 Humour

Our research proposes that humour in firm-initiated posts is an important factor encouraging all types of customer engagement. Humour is defined as a rhetorical device included in a message to persuade the audience (Meyer, 2000). A rhetorical device refers to a linguistic mechanism, which, in the case of humour, manufactures for instance a play on language to create a non-literal meaning (Weaver, 2010), with the goal of evoking attention and positive affect in the audience. According to Aristotle, to persuade someone through something pleasurable, the language should have a 'foreign air', something removed from the 'common-place' (Freese, 1926). Closely related to this is the notion of language novelty on social media, spurred by technological affordances (e.g. hashtags, memes, animated GIFs) as well as by the creative culture that gives rise to humour on social media. The significance of novel/clever, pleasurable content on social media lies in its great potential to generate a higher audience response (Brennan, Halliday, & Tafesse, 2015). Indeed, humour usually necessitates a response by the audience (e.g. laughing or smiling or at least smirking or winking) (Knight, 2008). Importantly, beyond "likes" or smiley face comments, humour on social media can initiate different kinds of sharing, including (1) sharing as diffusion; (2) sharing as participation; and (3) sharing as communication (Shifman, 2012). Previous studies show that consumers are more likely to disseminate firm-initiated videos involving humour (Brown, Bhadury, & Pope, 2010). Research on sharing as participation concentrates on online political campaigns and finds that using humour helps in generating cooperative actions from an audience (Shifman, Stephen, & Stephen, 2007). Sharing as communication means respondents perpetuate humour by imitating or repackaging the humorous language (Shifman, 2012). Based on the power of humour to initiate different kinds of audience responses, we propose:

H1. Humour posts lead to more customer engagement than non-humour posts.

2.3 Product-Focus

To investigate the relative role of humour in driving customer engagement, we also investigate other factors that could influence customer engagement, including the type of content addressed in the post (product vs. non-product posts) and the complexity of the post (length, lexical density and multimodality) (Fig. 1).

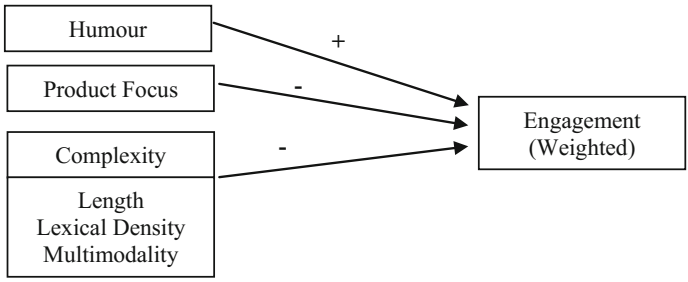

Fig. 1 Proposed theoretical model

Social media have created a new marketing paradigm—it is all about people sharing opinions, experiences and expertise in a networked online space (Gretzel & Yoo, 2013). To accommodate this change, marketers need to reflect social media culture in their marketing messages (Gretzel & Yoo, 2013) and adopt a "reach-through-relevance" approach (Russell, 2009). On social media, consumers exert a greater power than marketers in terms of actively seeking, creating, consuming and responding to firm-generated content (Brennan et al., 2015). It is no longer about what marketers want to communicate to consumers but all about communicating with consumers about the things they care about. Consequently, existing literature urges marketers to stay away from straightforward advertising and selling (Gretzel & Yoo, 2013). Instead, they need to focus on becoming involved in customers' experiences, lives and needs in order to foster value co-creation (Chathoth, Ungson, Harrington, Chan, Okumus, & Okumus, 2016).

Drawing on use and gratification theory, scholars have classified firm-generated online posts into product and non-product categories—the former includes informational and remuneration posts and the latter consists of entertainment and social posts (Brennan et al., 2015). While informational posts inform consumers about products, organizational news and marketing activities for the purpose of creating positive consumer experiences, remuneration posts contain information that associates with benefits including content featuring promotions, trials, coupons and other special offers (Coelho, Oliveira, Almeida, & O'Connor, 2016). Customers engage with product-related posts for the purpose of seeking information, gaining a reward or receiving economic incentives (Coelho et al., 2016). As consumers exert an increasing power on social media, however, it is challenging for marketers to use product-related posts to generate superior consumer response. Consumers, as sophisticated social media users, have become an expert and sceptical processor of advertisement (Baltas, 2003); they can access product-related content in a more convenient format and richer detail from alternative sources (Brennan et al., 2015) and, thus, are prone to ignoring ads.

As Russell (2009, p. 9) asserts, to engage consumers on social media, marketers should behave like "invited guests, bring wine" and talk about things that are relevant to the consumer. Consequently, non-product posts are credited with the capability of effectively engaging consumers on social media. Entertainment posts

provide consumers an opportunity to distract and divert themselves, and offer aesthetic enjoyment and emotional release (Luarn, Lin, & Chiu, 2015). Besides, social posts offer consumers content relating to their daily life, which encourages participation and facilitates interaction (Luarn et al., 2015). Social posts often contain phatic communication or small talk, which may include greetings and life philosophy (Kwok & Yu, 2013). Studies have shown that these non-product posts can exhibit high levels of commenting, liking and sharing (Brennan et al., 2015; Coelho et al., 2016; De Vries, Gensler, & Leeflang, 2012; Kwok & Yu, 2013; Luarn et al., 2015). First, consumers may consider these posts as more appealing to their friends than product-related posts (Luarn et al., 2015), hence fostering reposting. Second, the informal atmosphere characterising the day-to-day interactions on social media condition consumers to become more receptive of non-product posts (Brennan et al., 2015). Third, the entertainment value of the social media space is an important factor for using non-product posts to motivate consumers to participate in firm-initiated online activities (De Vries et al., 2012). Based on this evidence in the current literature, the following hypothesis is proposed:

H2. Product-related posts lead to less engagement than non-product posts.

2.4 Message Complexity

Complex messages require consumers to have high motivation and ability to process them (Otondo, Van Scotter, Allen, & Palvia, 2008). The current literature often discusses online post complexity by focusing on three constructs, including post length, lexical density and multimodality. While these factors can enhance the informativeness of marketing messages (Trefzger, Baccarella, & Voigt, 2015), they also elevate the resources needed for message processing. Social media posts typically have word limitations (Boyd, 2010), and social media consumers have been found to endorse pithy marketing messages (Lebherz, 2011). On social media, however, lengthy messages with too much information may confuse consumers, discourage their willingness to consume the information and lead to negative effects (Akdeniz, Calantone, & Voorhees, 2013). Lexical density—a kind of complexity resulting from the density of meaningful words in a text—influences the readability of the text (To, Fan, & Thomas, 2013). Texts with a high lexical density deliver compacting information that poses challenges for reading comprehension (Fang, 2005). Multimodality—a means of composing messages (Murray, 2013)—refers to complexity resulting from the need to process different textual elements: written text, images (still and animated), videos, emojis, hashtags and brackets. Highly complex messages create information overload—a state in which the amount of information that merits attention exceeds an individual's ability to process it. Previous research shows that online posts delivered through multimodal forms of the text (e.g. photo, video, text) negatively influence generating customer comments, reposts and likes, because they take customers a longer time to view and

understand (Luarn et al., 2015). When consumers are not able to process a message, they will reject/ignore it (Petty & Cacioppo, 2012). Based on the preceding discussion, the proposed hypothesis is:

H3. Message complexity leads to less engagement.

3 Methodology

3.1 Study Context

When discussing tourism marketing, China cannot be ignored. China's domestic tourism, as well as outbound tourism, have been experiencing rapid growth (China National Tourism Administration, 2016). China has been the largest outbound tourism market for three consecutive years, and is poised to overtake the US as the number one travel market in the world in 2017 (China Internet Watch, 2015). While preparing travel plans, an increasing number of Chinese tourists rely on social media platforms (China Internet Watch, 2016). Consequently, it is expected that by focusing on tourism marketing on Chinese social media, this research will be able to provide especially rich and relevant insights into customer engagement based on humour. The importance of the Chinese market will further ensure the practical significance of this research for Chinese and international marketers.

Sina Weibo offers this research an ideal platform to examine customer engagement through humour. It is one of the most popular microblogging networks in China, which not only has the largest number of consumers and firms, but also showcases rich firm-customer interactions (China Internet Watch, 2013). Moreover, the advanced technological basis of Sina Weibo allows this research to investigate and compare the distinctive structure of humour and non-humour messages, and the dynamic customer responses. Third, Sina Weibo entails a unique humour culture. Although the popularity of humour on China's social media as a whole is an important emerging trend, the use of humour on Sina Weibo is particularly eye-catching (China Daily, 2015).

3.2 Sample

Destination marketing organisations (DMOs) specifically charged with promoting tourism at a specific destination (Gretzel, Fesenmaier, Formica, & O'Leary, 2006), are optimal cases to study customer engagement through humour on social media. Among all travel-related corporate accounts on Sina Weibo, DMOs are major contributors (China Internet Watch, 2015); they fully leverage social media technologies to achieve their marketing goals (Ge, Gretzel, & Clarke, 2014). To test the conceptual model, a case study of one provincial/autonomous DMO was conducted

to be able to keep destination-specific impacts and influences stemming from the composition of the followers constant. To select the case, one of the authors subscribed to all provincial and autonomous DMOs with a Weibo presence and followed all activities for two weeks. Shandong DMO emerged as the most active and advanced user of Weibo and therefore represented the best case for this study.

3.3 Data Collection

This research selected DMO-initiated humour and non-humour posts published by Shandong DMO over the course of 1 month, starting September 10, 2014. All of the collected posts (301 in total) were further processed in two phases. In the first phase, irrelevant posts were removed. Irrelevant posts refer to repostings of customer-initiated posts because this research focuses on firm-initiated engagement strategies. In the second phase, humour posts were identified through three steps. First, in accordance with conceptualizing humour as a rhetorical device, firm-initiated humour posts were selected based on linguistic characteristics indicating non-literal use of language (Weaver, 2010) instead of focusing on the psychological mechanism of humour. Second, this research confirmed the humour identification through an online survey of 112 Weibo users recruited through the online survey platform Wei Diaocha. They were asked to simply determine the presence/absence of humour rather than rating the extent to which the posts were humorous or indicating the type of humour. Third, ambiguous posts were clarified with graduate students. A total of 15 posts could not be classified through these steps and were excluded. To obtain equal proportions, 100 humour posts and 100 non-humour posts along with consumer response metrics including liking, commenting and reposting were selected from the resulting sample.

3.4 Data Coding and Analysis

Based on the above discussion of customer engagement, this research argues that consumers disseminating messages to other consumers is the most important metric for tourism marketers. Following this line of thinking, this research adopted the weighted engagement formula used by Unmetric.com (likes + 5 × comments + 10 × reposts). Specifically, the posts had an average of 26 likes (minimum 3 and maximum 197), 48 reposts (minimum 2 and maximum 164), and 7 comments (minimum 0 and maximum 70). The average weighted engagement was 539 (minimum 34 and maximum 2187).

With respect to the independent variables, the posts had to be coded to reflect whether they contained humour, a product focus and three aspects of complexity. The humour coding strategy was explained in Sect. 3.3. Due to the sampling approach, exactly 50% of the posts included humour. While product-related posts

were coded to include informational and remuneration content, non-product posts were coded based on entertainment and social content (Brennan et al., 2015). Coding was done by one expert coder and confirmed by a second coder. A little over half (54.5%) of the posts were directly related to the destination or its tourism products/services, while the rest pertained to greetings, life philosophy or other non-product related topics. The correlation between humour and product-focus is significant but weak (with a coefficient of 0.271). Contrary to what one would expect, 68% of humour posts actually have a product/destination focus compared to 41% of non-humour posts.

Complexity encompasses three dimensions of posts: length, lexical density and multimodality. Post length was measured as the number of Chinese characters in a post. Characters were counted by using the Chinese Microsoft Word character count function. Lexical terms include nouns, verbs, adjectives and adverbs, and the lexical density is measured as the number of lexical terms divided by the total number of words per post (De Ascaniis & Gretzel, 2012). Lexical terms were identified based on Wu and Zou (2009) and the coding was confirmed by a Chinese linguistics expert. The posts included in the analysis were on average 82 characters long, with the minimum being 10 and the maximum 140. They included on average 59 lexical terms, with a minimum of 8 and a maximum of 114. The lexical density varied between 14.4 and 91.9%, with the average lexical density being 71.2%. A categorical length variable (short, long) was created using the average as the cut-off point; similarly, a categorical lexical density variable (low, high) was computed with the average lexical density as the cut-off point. With respect to multimodality, the elements coded were written text, static image, moving image, video, emoticon, hashtags and brackets. Only 5 posts (2.5%) of the total were text-only posts, and a large majority of posts (88.5%) contained a static image. Further, only 1 post contained a moving image and only 1 post contained a video; some of the posts (14%) contained emoticons. Interestingly, almost half (49%) of the posts contained brackets to emphasis certain text elements. About 22% of the posts also contained a hashtag. Multimodality reflects the amount of different elements a post contains beyond the text characters and was coded as 0 if the post was text-only, as 1 if it contained one additional element, etc. and therefore represents a scale from 0 to 6. The descriptive results show that 2.5% of the posts are text-only, 37.5% contain at least one multimodal element (static image, moving image, video, emoticon, bracket or hashtag), 43% contain 2 additional elements, 16.5% contain 3 and only 1 post (0.5%) contains 4 additional elements. None of the posts contain more than 4 additional elements. On average, posts contained 1.75 elements.

The data were analysed using the general linear model procedure in SPSS with weighted engagement as the dependent variable and humour, product focus, multi-modality, length and density as the factors. Interaction effects were not modelled as there was no theoretical support for them.

4 Results

The general linear model with weighted engagement as the dependent variable was significant overall, with an Adjusted R Squared of 0.255, suggesting that the elements considered in this study explain about one quarter of the variance of weighted engagement and that there are other things that drive engagement that are clearly not considered in the model (e.g. the actual content, quality of writing, time of posting, etc.). The research model assumed a positive impact of humour and negative impacts of product-focus and complexity. As the results show, humour was identified as a significant predictor ($F = 17.9$; $p < 0.001$), with humour posts encouraging consumers to engage more (Mean humour post = 587.3; Mean non-humour post = 490.6). Moreover, product focus emerged as the strongest driver of engagement ($F = 36.8$; $p < 0.001$), with non-product posts achieving higher levels (Mean non-product posts = 716.3 vs. product posts = 390.87). As far as complexity is concerned, much less pronounced but still significant influences were found for length and multimodality. Post length negatively influences engagement ($F = 5.0$; $p < 0.05$; Mean for below average length posts = 591.5; above average length = 496.8) as does multimodality—the more elements a post contains, the less engaging it is ($F = 3.0$; $p < 0.05$) (Text only Mean = 1112.0; Text +1 = 627.4; Text +2 = 465.1; Text + 3 = 456.2; Text +4 = 124). No significant influence was found for lexical density. However, the results confirm the hypothesized direction of influence, with the mean of low density posts being 597.2 and that of high density posts 478.4. Thus, except for lexical density, the model confirmed all proposed influences but showed that product focus is a stronger predictor of engagement than humour.

5 Conclusion and Discussion

The results of this research support the idea that tourism marketers can navigate customer engagement on social media by developing marketing messages through humour and with a specific content and structure. Based on these findings, this research can draw several theoretical and practical implications. The confirmation of the first hypothesis approves the notion that humour can be used as an effective communication tool to stimulate interactions (Meyer, 2000). The reason could be that in the context of social media, the innovative use of language through humour may shape a distinctive online participatory culture—it is concerned with new expression and engagement, strong support for creativity and a tendency to share entertaining messages (Shifman, 2012). Given the significant role of customer engagement in the tourism context (So et al., 2014), this result also supports the idea that humour may assist tourism marketers to have delighted customers and maybe even fans, permitting high levels of emotional bonds and relational exchange (Sashi, 2012). The confirmation of the second hypothesis supports the

idea that social media create a new marketing paradigm with a distinctive culture—it requires tourism marketers to deliver content relating to every aspect of consumer life (Chathoth et al., 2016) and to avoid hard advertising and selling (Gretzel & Yoo, 2013). This result also underpins the notion that non-product posts may assist marketers to speak to loyal customers, which permits a high level of relational exchange (Sashi, 2012). It also offers tourism marketers insight in terms of how to develop product-related posts endorsed by consumers. For instance, they can integrate social or entertaining elements into the posts promoting products and services. The confirmation of the third hypothesis emphasizes that online posts, which are planned to generate consumer responses, need to be designed in a way that they can be processed quickly and easily (Trefzger, Baccarella, & Voigt, 2015). This result also reminds tourism marketers that, although multimodal forms of text allow them to overcome the constraint of word limitations on social media, they still need to select appropriate elements based on the specific marketing communication goal and keep the message simple.

There are of course limitations to the research that suggest potential areas for future research. First, this research focused on one social media platform. Although Sina Weibo offers an ideal environment for examining customer engagement and humour, future research should investigate other platforms such as WeChat. Second, the case study method allowed for a look at the focal factors in isolation; however, it would be interesting to see whether the discovered effects hold true across DMOs with different follower contingents and destination brands. Third, although this study identified that humour posts lead to more engagement, it is not clear if humour posts always surpass non-humour ones. Depending on the nature of the content, e.g. negative factual messages, humour may be seen as inappropriate. Comparative research should be conducted to identify humour effects in positive and negative posts. Last, future research should identify additional factors that possibly drive weighted engagement.

Despite the limitations, the paper provides several contributions. First, it expands the use of humour in the tourism literature by adding a new application area. The extant literature mainly focuses on the use of humour in traditional media while the use of humour on social media is not mentioned at all. This research also broadens the current humour literature in tourism mainly focused on Western humour by introducing humour-related concepts in a Chinese social media context. Second, it offers insight into social media affordances and their linguistic relevance. Third, this research contributes to the literature on social media marketing in tourism and confirms that effective engagement depends on not only message content but also message structure. It also affirms that marketing on social media is indeed very different from traditional marketing and requires a rethinking of approaches and of the overall marketing mind-set.

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Complementary Factors Influencing U.S. Consumers' Intentions to Connect Their Tablets to Hotel Networks: The Roles of Hedonic Motivations, Trust, and Heuristics

Cristian Morosan and Agnes DeFranco

Abstract Several information security-related events (e.g., data breaches, discovery of system vulnerabilities) prompted hotels to take measures to strengthen the security of their systems. The ubiquitous Internet connection and its corresponding infrastructure represents a potential ground for cyber attacks that could threaten guests' privacy and the integrity of the data they exchange while connecting their tablets to hotel networks. Such problems are exacerbated in international travel due to the heterogeneity of hotel practices, national cyber-activity initiatives, and the Internet and e-commerce infrastructure. Grounded in information system and social psychology theory, this study developed a conceptual model that explains consumers' intentions to connect their tablets to hotel networks. Using data collected from 1017 U.S. consumers who stayed in hotels abroad, this study found that trust in the system, heuristics, and hedonic motivation are significant predictors of intentions, and that privacy assurance strongly influences consumers' perceptions of trust.

Keywords Mobile tablets · Mobile commerce · Trust · Heuristics · Hedonic motivation · Hotel cyber-security

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1 Introduction

In the light of the recent cyber attacks, industry experts began calling for the strengthening of the security protocols of hotel information systems (IS) (Bolger, 2016). Concurrently, several large travel organizations initiated efforts to reward individuals who report system vulnerabilities (Edwards, 2015). In addition, supra-industrial organizations (e.g., Payment Card Industry) continued to push for industry-wide practices that enhance cyber-security at all points of the value chain. Despite such initiatives, it remains difficult to ascertain the extent to which specific consumer-facing systems and services are completely secure. An inherently ubiquitous consumer task/service is the network connectivity service, which allows consumers to connect their mobile computing devices and peripherals to hotel networks to access the Internet while staying in hotels. This service has gradually become a component of the expected hotel product (Kotler, Bowen, Makens, & Baloglu, 2016), and has generated various pricing and promotional strategies to attract consumers to use it.

Despite an inherent and circumstantially tolerable level of risk, consumers extensively connect their mobile devices (e.g., laptops, tablets, smartphones) to the Internet when staying in hotels, as illustrated, for example, by vast consumer-generated content. Yet, in the wake of recent cyber-attacks, hotel industry stakeholders reiterated the idea of network vulnerability, and emphasized the need to increase the security of the Internet connection. Hotel Internet connections may present vulnerabilities, which, associated with consumer behaviours (e.g., using unsecure browser sessions, downloading malicious attachments, responding to phishing attacks) could, in theory, provide backdoor access to malicious individuals/software. Yet, in international travel, mobile devices connected to hotel networks represent a consumer's only viable option to communicate with his/her loved ones, employer, or client. Tablets make no exception, as they only to a limited extent incorporate technology designed to connect them to local phone carrier networks via roaming services (akin to smartphones), and are predominantly used as thin clients to access resources accessible via the Internet. Thus, given the relatively public nature of the hotel Internet connectivity, connecting a tablet to the Internet when staying in a hotel is not without risk.

In this context, understanding what drives consumers to develop intentions to connect their tablets to hotel networks to access the Internet becomes critical, as it can result in a wide range of consequences, from very positive (i.e., a better stay experience, connectivity) to very negative (i.e., unauthorized system access). The risk of the ubiquitous tablet connectivity to a hotel network (e.g., attacks via malware, unauthorized access to stored resources, hardware/software destruction, credential theft) severely outweighs the risk associated with online purchasing (e.g., typically the loss of revocable payment credentials such as credit card numbers). However, to date, scholars concentrated mainly on transactional aspects of IT use in hotels (Amaro & Duarte, 2013), overlooking the connectivity aspects. There is no research that discusses the consumers' system connectivity to the hotel networks,

thus marking an important knowledge gap. In addition, while the literature has explored utilitarian motivations to use mobile devices for purchasing (Wang & Wang, 2010), the focus has not been on tablets used while on the property, therefore marking a second gap. Moreover, while studies on systematic processing of information leading to decisions abound in the literature (Chang & Wu, 2012), the role of heuristic processing has not investigated extensively beyond mainstream psychology, marking a third gap. To address these gaps, this study's main goal was to empirically validate a conceptual model that explains consumers' intentions to connect their tablets to hotel networks when traveling internationally grounded in complementary antecedents, task-technology perceptions (i.e., trust), contextual characteristics (i.e., hedonic motivation) and psychological cues (i.e., heuristics).

2 Review of Literature and Model Development

Recognizing the broad task environment of the tablet's connectivity to a hotel network, this study sought to find a combination of constructs that (1) are parsimonious and can be easily operationalized, (2) address fundamental system perceptions that reflect the international hotel IS environment, and (3) taken together are capable characterizing the psychological mechanisms governing the intentions to connect a familiar system to a less familiar hotel network. Thus, this study incorporates hedonic motivation from the neo-classic adoption theory (Venkatesh, Thong, & Xu, 2012), privacy assurance and a dyadic conceptualization of trust (i.e., trust in organization and in system) as descriptors of the international hotels' IS environments (Morosan & DeFranco, 2015), and heuristics from persuasion theory (Chaiken & Maheswaran, 1994), which reflects the psychological mechanisms developed by consumers in familiar contexts and applied in unfamiliar ones.

Hedonic motivation characterizes the entertainment value resulting from using an IS (Venkatesh et al., 2012), and complements the utilitarian value (Curran & Meuter, 2005). As IS evolved to allow consumers to enjoy their task completion (Oh, Kim, Lee, Shim, Park, & Jung, 2009) or focus on non-task aspects of utilization (Dwivedi, Shareef, Simintiras, Lal, & Weerakkody, 2015), hedonic motivations have been increasingly incorporated in IS behavioral models (e.g., playfulness in Zhu and Morosan (2014); experiential value in Jia, Wang, Ge, Shi, and Yao (2012). In a variety of studies, hedonic motivations have been found to directly influence behavioural intentions to engage in commercial tasks (Morosan & Jeong, 2008). Accordingly, the hedonic motivations are expected to influence consumers' behavioural intentions to connect tablets to hotel networks as generally, the tablet use experience is geared toward hedonic needs, especially when traveling abroad. Thus, the following hypothesis was developed.

H1: There is a positive relationship between consumers' hedonic motivation and their intentions to connect their tablets to hotel networks when traveling internationally.

In IS, trust reflects the expectations of users regarding the behaviour/motivations of a "trustee" (i.e., organization providing services) (McKnight, Choudhury, & Kacmar, 2003). Such behaviours and motivations have important risk connotations, especially when the outcomes of consumer-firm interactions are uncertain (Shapiro, 1987). In such situations, trusts acts as a self-control mechanism (Shapiro, 1987), which allows consumers to mitigate risk and uncertainty (McCole, Ramsey, & Williams, 2010). In the wake of recent cyber-attacks, consumers may form perceptions of risk associated with connecting their tablets to hotel networks when traveling internationally. Accordingly, in order for consumers to connect and use their tablets to hotel networks, trust needs to form as a critical mechanism for mitigating risk and uncertainty.

While trust has been at the forefront of academic interest in IS (Antoniou & Batten, 2011), a few scholars conceptualized trust in the system as an antecedent of behavioural outcomes that reflected approaching the brand (e.g., Dinev & Hart, 2006). Given the inherent intangibility of hotel experiences in unfamiliar international hotels, the risk associated with connecting tablets to hotel networks can pose risk. This is similar to other electronic commerce contexts, such as online purchasing (Metzger, 2006). In such unfamiliar or risky situations, trust in the hotel may be among the fewest mechanism capable of mitigating risk and setting the consumers on a path toward intentions. While such relationships were never investigated, similar contextual references suggest trust in the system as a factor influencing consumers' intentions to use IS in uncertain industrial and IS environments (Metzger, 2006). Thus, the following hypothesis was developed.

H2: There is a positive relationship between consumers' trust in system and their intentions to connect their tablets to hotel networks when traveling internationally.

An important area of risk associated with IS utilization in hotels is privacy risk. Such risk diminishes as a result of using fair information practices (Culnan & Bies, 2003), which manifest in limiting the data collected as a result of transactions and protecting consumer data (Hui, Teo, & Lee, 2007). Organizations disclose that they are following such principles by posting "privacy assurance" statements (e.g., TRUST3, BBBOnline) (Hui et al., 2007). By allowing consumers to make a realistic assessment of privacy risk, such assurances may drive consumers to behaviours toward the organization by increasing the utility of such behaviours (Xie, Teo, & Wan, 2006).

Given the importance of privacy concerns for consumers connecting their tablets to unknown networks (Milne & Culnan, 2004), privacy assurance was found to be associated with organizational reputation (Gefen, Karahanna, & Straub, 2003). The organizations communicating such assurance are expected to maintain their privacy standard and are aware that diminishing such standards can result in reputation damage or litigation (Metzger, 2006). Thus, privacy assurance could, in theory, diminish consumers' privacy concerns (Wirtz & Lwin 2011), and eventually could enhance the overall trust in the organization (Petty & Andrews, 2008) and its practices (e.g., business models, systems) (Metzger, 2006). Thus, such information becomes critical in shaping consumers' system perceptions (i.e., its ability to

complete a task without loss of privacy) and trust in the organization (i.e., its ability to develop business practices that safeguard privacy). Accordingly, the following hypotheses were developed.

H3: There is a positive relationship between consumers' privacy assurance perceptions and their trust in system that connects their tablets to hotel networks when traveling internationally.
H4: There is a positive relationship between consumers' privacy assurance perceptions and their trust in the organization that provides connectivity services for their tablets when traveling internationally.

The broader management and marketing literature documents predominantly conceptualizations of trust in an organization (e.g., Chen & Dibb, 2010). Trust in an organization forms as a result of the uncertainty associated with its business practices (Lin, Lu, Wang, & Wei, 2011), and is likely to contribute to positive consumer perceptions of the commercial environment (e.g., Bonsón Ponte, Carvajal-Trujillo, & Escobar-Rodríguez, 2015) and encourage consumers to engage in mobile device-related tasks (Yu, Yang, Chau, & Cao, 2011). When connecting tablets to unknown hotel networks, a consumer encounters some degree of risk. Risk is exacerbated by the need to engage in certain behaviours once connected, such as logging into accounts to access personal content, exchanging private information over networks, etc. Thus, when consumers trust their hotel, they are likely to form perceptions that the hotel would deploy systems (e.g., networks, business practices) that mitigate the commercial risks (e.g., privacy, security). Accordingly, the following hypothesis was developed.

H5: There is a positive relationship between consumers' trust in the organization and their trust in the system associated with connecting their tablets to hotel networks when traveling internationally.

Heuristic (peripheral-route) processing has received substantial attention in the consumer behaviour literature upon the development of theoretical frameworks on processing, such as the systematic-heuristic model (Chaiken, 1980) and the elaboration likelihood model (Petty & Cacioppo, 1981). Heuristic processing reflects an individual's decision making based on a lower level of elaboration, especially when motivation or capability for effortful elaboration is low (Chaiken & Maheswaran, 1994). This may result in attitudinal/behavioural outcomes that reflect pre-designed heuristic cues (e.g., trusting experts, deciding based on the number of arguments) (Chaiken & Maheswaran, 1994)—or psychological shortcuts (Chang & Wu, 2012)—that are employed without substantial consideration (Kim & Benbasat, 2003).

Heuristics are used in uncertain contexts as a coping mechanism for uncertainty (Egger, 2003) and represent important factors with influence on consumer behaviour (Yang, Hung, Sung, & Farn, 2006). Given the increasing amount of information available in commercial situations and the cognitive abilities required to analyse information of such magnitude, heuristics, as decision inputs, have gained an unprecedented importance (Ludwig, de Ruyter, Friedman, Brüggen, Wetzels, & Pfann, 2013). In familiar contexts that require connecting tablets to networks to

access the Internet (e.g., home, employment, education, domestic travel), the decisions to connect a tablet to a network may follow the path of heuristic processing. Given the ubiquity of such tasks, it is likely that the heuristic processing be extended to international hotel stays, as such contexts can be characterized by the tenets of heuristic processing: low motivation (i.e., task similarity to the familiar environments) and low ability (i.e., difficult to assess the consequences of connectivity). Accordingly, the following hypothesis was developed.

H6: There is a positive relationship between consumers' heuristics and their intentions to connect their tablets to hotel networks when traveling internationally.

3 Methodology

Data were collected using a survey instrument. The scale for hedonic motivation (3 items) was adapted from Venkatesh et al. (2012). The scale for trust in organization (3 items) was adapted from Norberg, Horne, and Horne (2007). The scale for privacy assurance (4 items) was adapted from Hui et al. (2007). The trust in system scale (3 items) was adapted from Walczuch, Lemmink, and Streukens (2007). The scale for heuristics (4 items) was adapted from Chang and Wu (2012). The intentions scale (3 items) was adapted from Venkatesh et al. (2012). All scale items were measured using Likert-type scales (1 = strongly disagree; 5 = strongly agree). The instrument also included behavioural and demographic sections. The data collection took place in July 2016. A U.S. nationwide sample was accessed via a market panel firm, which sent a total of 11,645 invitations to participate in the study. There were two filtering questions, asking respondents whether they had stayed in a hotel abroad during a period of 12 months period prior to the study, and whether they generally bring mobile devices when staying in hotels abroad. A total of 1017 responses (response rate of 8.73%) that fit the criteria to be collected. To check for non-response bias, a comparison of early versus late responses was conducted (Ary, Jacobs, & Razavieh, 1996) and revealed no non-response bias.

4 Results and Discussion

Tables 1 and 2 present summary descriptive statistics. The majority of respondents were male, between 30 and 39 years old, had graduate degrees and annual household incomes greater than the $50,000 per year. Most respondents travelled internationally 1–2 times a year, staying 4–7 nights, typically in upscale hotels and were relatively evenly split between leisure and business travel.

A confirmatory factor analysis was conducted to assess the psychometric properties of the instrument, using Mplus v.5 (Muthén & Muthén, 2007). The data set was tested for multivariate normality, using Mardia's coefficients (Mardia, 1970). While the individual variables displayed appropriate univariate normality,

Table 1 Demographic characteristics

Characteristic	Percentage
Gender	
Male	58.4
Female	41.6
Age	
24 or younger	3.2
25–29	15.3
30–39	41.5
40–49	14.4
50–59	12.7
60 or older	12.7
Education	
High school degree or equivalent	8.0
Bachelor of science/arts or equivalent	44.0
Graduate degree (MS, PhD, law, med.)	46.3
Other	1.8
Annual household income	
$50,000 or less	9.1
$50,001–$100,000	35.1
$100,001–$150,000	31.7
$150,001–$200,000	15.3
$200,001 or more	8.7

multivariate normality was not established. This result called for using estimators that are robust to violations of multivariate normality (Muthén & Muthén, 2007). A first analysis showed that three of the original scale items (i.e., items used to measure privacy assurance, heuristics, and intentions) had low loadings and were removed and the model was respecified.

The measurement model had a good fit, with a $X^2 = 214.783$ and d. f. = 103 (normed $X^2 = 2.08$), a Comparative Fit Index (CFI) of 0.97, a Tucker Lewis Index (TLI) of 0.96, and a Root Mean Square Error of Approximation (RMSEA) of 0.041 (Toh, Lee, & Hu, 2006). To assess reliability, composite construct reliability measures (CCR) were calculated for each latent construct. They were found to be greater than 0.7, which indicates appropriate reliability (Hair, Black, Babin, & Anderson, 2009). The factor loadings permitted the calculation of several measures of convergent and discriminant validity (Table 3). The factor loadings were greater than 0.65 and were significant, and all squared multiple correlations exceeded 0.4, indicating appropriate convergent validity (Hair et al., 2009). The average variance extracted from each latent construct exceeded 0.5, indicating appropriate convergent validity (Fornell & Larcker, 1981). Discriminant validity was assessed by comparing the average variance extracted (AVE) from each latent construct with their corresponding inter-construct squared correlations (Table 4). Except for two values that had minimal deviations, all AVE values were greater, indicating appropriate discriminant validity (Fornell & Larcker, 1981).

Table 2 Behavioral characteristics

Characteristic	Percentage
International travel frequency	
Less than once a year	12.4
1–2 times a year	44.1
3–6 times a year	23.9
7–12 times a year	14.4
More than 12 times a year	5.1
Typical length of hotel stay	
1 night	2.4
2–3 nights	21.2
4–7 nights	47.8
8–14 nights	20.9
More than 14 nights	7.7
Type of hotel most commonly used	
Luxury	11.1
Upper upscale	37.1
Upscale	21.1
Upper midscale	16.6
Midscale	8.3
Economy	3.4
Other	2.5
Typical purpose of travel	
Exclusively business	8.5
Mostly business	24.9
Combined business and leisure	27.7
Mostly leisure	14.6
Exclusively leisure	24.3

The research model was tested to ascertain fit and provide data for hypothesis testing (Fig. 1). The data supported all hypotheses in their predicted direction, thus validating the full proposed model. The model had appropriate fit, with a X^2 = 306.269 and d.f. = 109 (normed X^2 = 2.80), a CFI of 0.95, a TLI of 0.94, and a RMSEA of 0.053 (Hair et al., 2009). The trust in the system was validated as the strongest predictor of intentions ($\beta = 0.406$, $p < 0.001$), followed by heuristics ($\gamma = 286$, $p < 0.001$) and hedonic motivation ($\gamma = 106$, $p < 0.01$). Trust in the system was influenced more strongly by privacy assurance ($\gamma = 754$, $p < 0.001$) than by trust in organization ($\beta = 175$, $p < 0.01$), while the relationship between privacy assurance and trust in organization was found to be strong ($\gamma = 705$, $p < 0.001$).

Of all predictors of intentions, trust in the system was the strongest. Trust in the system reflects rather functional aspects of the task environment, which are predominant in uncertain/risky tablet use contexts. This result is not surprising, considering that trust in the system, and its antecedents, reflect mainly the functionality of the Internet connections in hotels and the hotels' managerial practices.

Table 3 Convergent and discriminant validity

Constructs	Items	Loadings	SMC	AVE	CCR
Hedonic Motivation	1 2 3	0.700 0.870 0.678	0.490 0.757 0.460	0.580	0.80
Privacy Assurance	1 2 3	0.800 0.855 0.786	0.640 0.731 0.618	0.663	0.86
Trust in organization	1 2 3	0.716 0.659 0.830	0.513 0.434 0.689	0.545	0.79
Trust in system	1 2 3	0.822 0.740 0.714	0.676 0.548 0.510	0.578	0.80
Heuristics	1 2 3	0.803 0.672 0.802	0.645 0.452 0.643	0.580	0.80
Intentions	1 2	0.686 0.772	0.471 0.596	0.533	0.70

Table 4 Discriminant validity

Constructs		1	2	3	4	5	6
Hedonie motivation	1	0.580					
Privacy assurance	2	0.026	0.663				
Trust in organization	3	0.508	0.487	0.545			
Trust in system	4	0.051	0.686	0.508	0.578		
Heuristics	5	0.038	0.421	0.242	0.664	0.580	
Intentions	6	0.055	0.315	0.126	0.416	0.350	0.533

Note The values on the diagonal represent the average variance extracted (AVE) while the values below represent the shared variance (squared correlations)

Interestingly, privacy assurance had a very strong effect on both trust in the system and trust in the organization. This result clarifies the role of privacy assurance in settings that are not transactional, and underscores the importance of corporate communication to stimulate consumers' trust.

Heuristics had a significant, yet relatively low impact on intentions, which underlines that to some extent, consumers rely on psychological shortcuts to form intentions to use IS in unknown task environments. Yet, this impact is mitigated by the perception of the ability of the IS to provide a safe platform for Internet connectivity. Similarly, a smaller effect was found between hedonic motivation and intentions, underscoring that consumers view the task of connecting their tablets to hotel networks in predominantly functional terms, or would put less emphasis on elaborating on it, without extensive hedonic benefits.

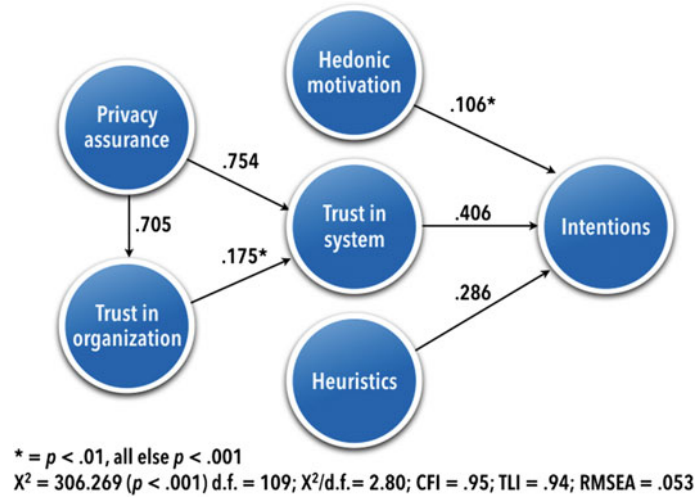

Fig. 1 Model testing results

5 Contributions

The study's goal was to validate a conceptual model explaining intentions to connect tablets to hotel networks when traveling internationally. Its full empirical validation provides several important contributions to academia and managerial practice. First, this is one of the fewer studies to focus on non-transactional tasks, which positions itself uniquely within the IS literature and marks an important step forward in understanding processes that are not totally commercially driven. The task environment discussed here is ubiquitous in most scenarios, but becomes more critical than most tasks studied in the IS literature when the environment fails to support the task; that is, when consumers are unwilling or unable to connect to the Internet they cannot support some of the most routine tasks, while, most importantly, connectivity to unsecured networks may result in a variety of privacy-related negative consequences. Thus, the findings presented here provide a solid initial understanding of factors that lead to consumers' intentions to engage in critical tasks.

Second, this study has unique value due to its focus on tablet utilization behaviours while the consumers are on the property. As most of the existing literature focuses on tablet use prior to or post-purchasing, this study addresses the processes that lead to tablet utilization during the most critical phase of hospitality purchasing, and explains how consumers engage in behaviours that are influenced by the surrounding consumption environment.

Third, this study brings substantial contributions by validating a model that relies on concepts that reflect systematic processing in uncertain situations, such as trust in the system and trust in the organization, together with heuristics and hedonic motivations, which suggest heuristic processing. Privacy assurance involves central

route processing as it could be linked to anxiety and privacy concerns, while the ubiquity of the task and the ease of completion requires the incorporation of heuristics as mechanisms of coping with easy to use, routine tasks. Thus, although the higher role of trust in the system is recognized, this study offers initial insight into the complementarity of psychological processing and bridges a critical literature shortcoming: the predominant focus on systematic processing.

This study presents a blueprint of the factors that influence consumers' intentions to connect their tablets to hotel networks and offers hotel decision-makers actionable advice on how to develop valuable task environments and provide Internet connectivity services that stimulate the consumers and increase the value of their experiences. First, given the critical role of privacy assurance and trust in the system, hotels should focus on (1) designing the appropriate safety network protocols so that the hotels are trusted, and most importantly (2) communicate properly about how security is being addressed. This way, consumers are likely to develop perceptions of trust in the system, which will result in strong intentions to use such networks. It is also important to recognize the heuristic nature of consumers' connecting their tablets. As consumers are influenced by peripheral cues, they are likely to disregard messages that are important (e.g., security, pricing, etc.) that require systematic processing. As a result, in order to improve the task environment and the value associated with it while the consumers are on the property, hotels need to make sure the communication with the consumers is seamless and effective.

6 General Conclusions

The study presented here was motivated by the increasing number of tablets that are connected to hotel networks worldwide. By recognizing the complementarity of systematic and peripheral processing, this study validated trust in the system, heuristics, and hedonic motivations as significant predictors of intentions. By explicating how consumers utilize their tablets in international hotel contexts, this study shifts the focus away from pure commercial tasks, and stays at the foundation of a new academic research direction that could explain broader consumer behaviours in IS use in travel. Yet, more research is needed to examine more detailed aspects of mobile device connectivity, such as differential effects of travel motivation (e.g., business vs. leisure), consumers' need for cognition of security information and firm security communication policies.

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Twenty-Five Years Past Vogt: Assessing the Changing Information Needs of American Travellers

Yeongbae Choe, Daniel R. Fesenmaier and Christine Vogt

Abstract Travel behaviour has changed considerably over the past 25 years as the internet, social media and mobile systems have become integrated into our everyday lives. In particular, the nature and extent of information search is one of the most important aspects of travel behaviour effected by these advancements. This study assesses the impacts of these technologies on travellers' information needs by comparing the results of studies by Vogt and her colleagues conducted before the advent of the internet and a comparable study conducted recently. The results of this study indicate that functional information is still most important, but the importance of all other information needs (i.e., hedonic, innovation, experiential, and sign) increased significantly as compared to the pre-internet era. Functional information was found to be more important before the trip than during the trip. Innovation and hedonic information were more important during the trip compared to before the trip. In the sign information construct, "social" stands out as being important compared to advisory or symbolic. The theoretic and practical implications are discussed as this study demonstrates the ways travellers search for and use information continues to evolve as the internet becomes more fully integrated into our daily lives.

Keywords Trip stages · Information search · On-the-go travellers · Longitudinal study

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1 Introduction

Information plays an essential role in guiding both supply and demand within the tourism industry (Benckendorff, Sheldon, & Fesenmaier, 2014; Gretzel, Fesenmaier, & O'Leary, 2006). From the traveller perspective, information search is one of the most important and the earliest steps for making their trip-related decisions including choice of destination, accommodations, activities, and so on (Jeng & Fesenmaier, 2002). Indeed, information search can be seen as a critical task for a traveller who wants to avoid risk, enhance the quality of their trip and finally maximise its benefits (e.g., Cho & Jang, 2008; Vogt & Fesenmaier, 1998). Research in this area finds that travellers search for information not only to make 'practical' or 'core' decisions which are supported through functional information, but also for satisfying various innovation, sign, hedonic, and aesthetic needs (Cho & Jang, 2008; Vogt, 1993; Vogt & Fesenmaier, 1998). Thus, it is argued that fulfilling these information needs is the raison d'être for marketers when designing their communication strategies. As such, many scholars and practitioners have focused on understanding traveller information search behaviours for communicating with their current and potential customers, as well as to influence their future travel decisions (Goossens, 2000; Jeng & Fesenmaier, 2002; Vogt & Fesenmaier, 1998).

Development of information communication technology (ICT) over the past 25 years has transformed many aspects of the information search process (Benckendorff et al., 2014; Gretzel et al., 2006). Prior to the internet era, travellers largely used personal communication and mass media (e.g., newspapers, guidebooks, etc.) for trip planning, whereas travellers now actively search for the information via both online and offline information channels (Xiang, Wang, O'Leary, & Fesenmaier, 2015a, b). Further, more recent developments of mobile technologies and social media have enabled travellers to continuously search for the information even during their trip so that they can adapt to 'opportunities' at the moment, to share their experiences (both good and bad) with friends and those friend's expanded online social network, and even to create new experiences such as finding a friend in a geographic place. Importantly, recent tourism research suggests that these changes in travel behaviours have resulted in fundamental changes in the trip experience (MacKay & Vogt, 2012; Xiang et al. 2015a, b). That is, during the pre-internet era, travellers often planned almost all aspects of their trip *before* leaving home (e.g., pre-trip planning), and consequently, they largely followed a planned itinerary using maps and other printed materials to guide their travel decisions. Most tourism research at that time focused on pre-trip planning behaviours (e.g., Jeng & Fesenmaier, 2002; Vogt, 1993; Vogt & Fesenmaier, 1993, 1998; Vogt, Fesenmaier, & Mackay, 1994). With the emergence of ICTs, travellers maintain continuous access to travel information, enabling them to make much more spontaneous decisions throughout the entire trip; as shown in recent studies by Hwang (2010), Lamsfus, Wang, Alzua-Sorzabal, and Xiang (2014) and Zach and Gretzel (2012).

This study focuses on important issues related to the structure of travellers' information needs, and how these needs have changed over the past 25 years. In particular, this study first attempts to replicate Vogt and Fesenmaier's (1998) study to assess the stability of travellers' information need structures in response to the developments of information technology as their study was conducted immediately *before* the internet and its integration within the travel industry. The study also extends Vogt and Fesenmaier's research (1998) by examining differences in information traveller information needs *before* the trip and *during* the trip. The results of this study contribute to our understanding of the essential information needed by travellers and therefore provides a foundation to develop marketing strategies across all information distribution channels.

2 Theoretical Foundation

Information search behaviour is a dynamic and continuous process wherein travellers use various amounts and types of information to plan and execute their trip (Jeng & Fesenmaier, 2002). During this process, travellers often need information to answer a range of questions related to which destination(s) to visit, how to spend their time at a destination and so on; Fesenmaier and Vogt (1993), Vogt (1993), Vogt et al. (1994) and Vogt and Fesenmaier (1998) describe these information needs as goal-directed or 'functional' in nature. This current research also shows that many travel decisions are based upon emotions and social influences. Indeed, Vogt and her colleagues (Vogt et al. 1994; Vogt & Fesenmaier, 1998) found that hedonic, innovation, aesthetic, and sign needs play important roles in planning travel. More recent studies (Lerner, Li, Valdesolo, & Kassam, 2015; McCabe, Li, & Chen, 2016) confirm these findings and the importance of emotion and sign/social in the decision-making process. In Vogt and Fesenmaier's (1998) study, five information need constructs and 15 sub factors were identified. First, the functional construct, described as motivated and goal-directed efforts, is related to travellers' knowledge, uncertainty or risk reduction, utility or perceived value, and efficiency on their time spent and costs incurred. Second, the hedonic construct views travellers as a pleasure seeker and includes four sub-concepts—phenomenology, experiential, sensory, and emotion—in order to capture the psychological experiences often sought by travellers. Third, the innovation construct includes three factors—novelty seeking, variety seeking, and creativity—to describe the extent to which travellers seek new information to adopt novel products and/or do something new. Fourth, the aesthetic construct describes the extent to which travellers imagine and fantasize their future trips/behaviours. Last, the sign construct describes the interpersonal, social, and symbolic aspects of information behaviours (Cho & Kerstetter, 2004).

Information and communication technology (ICT) has evolved substantially over the past 25 or so years. As shown in Fig. 1 and discussed by Werthner and Klein (1999) and Xiang et al. (2015b), the internet has evolved from a 'simple' system of

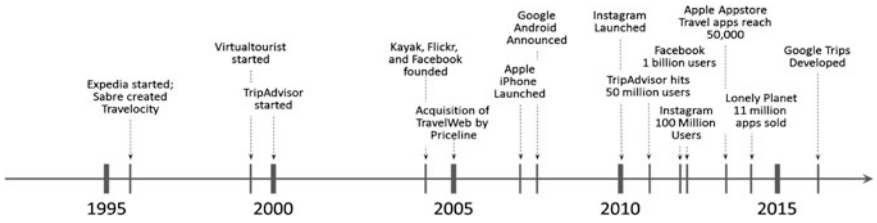

Fig. 1 Developments on the Internet and its relationships with Tourism industry (Adapted from Xiang et al., 2015)

websites which offered electronic brochures and limited interactive services to a "system of systems" wherein users create and share information, and travellers obtain information about essentially all aspects of the trip before, during and after. Further, Benckendorff et al. (2014) and Buhalis and Law (2008), among many others, argue that the nature and level of ICT development and its integration into our daily lives has had considerable impact on travel and, in turn, the travel industry.

One of the most important influences of this development is in the change in the supply chain of tourism products and services by the development of new systems linking consumers and suppliers (e.g., online travel agencies, destination websites). Xiang et al. (2015a, b) posit that the most significant changes in traveller behaviour were triggered by the introduction of Web 2.0 as a platform and mobile systems such as SMART phones. Additionally, the introduction of mobile devices (e.g., smartphone and wearable devices) create a new landscape which enables the many social aspects of travel (Wang, Park, & Fesenmaier, 2012; Wang, Xiang, & Fesenmaier, 2014; Xiang et al., 2015a, b). That is, through the combination of various online platforms with mobile devices, travellers can now easily access a variety of types of information and communication channels (e.g., online review sites, online communities) which helps them to decide what to do, how to do it, and what it means; this, in turn, shapes the nature of their experience throughout the trip. Several studies have empirically demonstrated that the use of information channels by travellers is an extremely dynamic process depending on the stage of the trip experience (Bieger & Laesser, 2004; Choe, Kim, & Fesenmaier, 2016). With the rapid development of mobile technology, information searching behaviour is not limited to any one specific period of travel (Gretzel et al., 2006; Wang et al., 2012, 2014). With this in mind, this study posits that the structure of traveller information needs has changed radically to adapt to this new ICT environment and new decision-making processes.

3 Methods

The two studies compared in this paper use survey methods and a questionnaire. Over the 25 years, online surveys are more common and cost effective compared to the wide use of mail surveys in the early 1990s. This study included three important

features in the data collection process in order to make the current study be comparable with the earlier one conducted by Vogt and Fesenmaier (1998) in 1992. First, the information need scale items were the same across the two studies. Although the original survey was a paper-based and a fixed-order survey, the current online study randomised the order of survey items within each question set for half of the respondents. Survey respondents were randomly split across one of two hypothetical scenarios to test for differences in information needs *before* versus *during* the trip.

Second, the geographical boundaries for the survey context were matched with the Vogt and Fesenmaier (1998) study (i.e., the Midwest). Third, the source of the population or travellers and their contact information (i.e., persons requesting travel information from travel offices) was the same across the two studies. To do so, the sample included American travellers who had requested travel-related information in response to a Midwest destination marketing program. In 2016, 27,929 online survey invitations were successfully delivered via email to the population. In 1992, a sample was drawn to estimate the population. The data used for this current study were obtained using an online survey between June 10, 2016 and June 20, 2016. This study used the following three-step solicitation process: (1) an initial invitation was sent out on Friday; (2) a reminder was delivered to those who had not completed the survey three days later; and (3) the final request for survey participation was sent out two days later. As a result, 1,093 usable responses were returned (3.9% response rate). The 1992 study employed a mail survey of 500 information requestors and resulted in 305 usable responses for a 62% response rate.

4 Findings

4.1 Sample Characteristics

The characteristics of the respondents are summarised in Table 1. A majority (67% for both before/during groups) of the respondents are female and about 85% for both groups are 45 years old or older. Over half of the sample have an annual household income of at least $70,000 or more and approximately a slightly more than half (before: 59%, during: 56%) have some college degrees (e.g., bachelor's degree, associate or technical degree). In general, respondents took several day trips (before: 51% took at least one trip with m = 5.45, during: 51% with m = 7.13), short overnight trips (before: 67% with m = 3.45, during: 61% with m = 3.22), or long overnight trips (before: 35% with m = 2.86, during: 36% with m = 2.38) to destinations in the Midwest over a 12-month period. Analyses indicate no statistical differences in demographic and trip characteristics between the respondents to the two scenarios—i.e., before and during the trip.

Table 1 Sample characteristics for current study

Demographic		Before (n = 414)	During (n = 413)	p-value
Gender[a]	Male	33.1%	32.7%	0.894
	Female	66.9	67.3	
Age[a]	18–24	0.6%	0.3%	0.358
	25–34	4.4	3.3	
	35–44	9.4	11.1	
	45–54	27.5	21.7	
	55–64	29.2	34.5	
	65 and over	28.9	29.0	
Annual household income[a]	Less than $9,999	1.7%	2.8%	0.965
	$10,000–$19,999	2.8	2.1	
	$20,000–$29,999	5.9	6.4	
	$30,000–$39,999	8.3	7.4	
	$40,000–$49,999	12.1	1.6	
	$50,000–$59,999	8.6	9.5	
	$60,000–$69,999	6.9	8.1	
	$70,000 and greater	53.8	53.0	
Highest education[a]	Junior high graduate	−%	0.6%	0.353
	High school graduate	16.2	19.4	
	Associate or technical degree	24.9	24.5	
	Bachelor's degree	33.8	31.8	
	Master's degree	2.1	2.8	
	Doctoral degree	5.0	2.8	
Past trip experience to the Midwest[b]	Day trips	5.45	7.13	0.160
	Short overnight trips	3.45	3.22	0.420
	Long overnight trips	2.86	2.38	0.356

Note [a]Numbers indicate the proportion of each group within the timing of their trip
[b]Numbers indicate mean values of those who took at least one trip over the past 12 months

The demographic profile of the 1992 study was essentially identical on gender (67% female). Educational attainment was higher in the recent study with a bachelor's degree as the mode, whereas in 1992 the mode was a high school degree as the highest level of education. On number of trips, the 1992 and current samples were similar on day trips (5.5 mean for both). Overnight trips were more common in the current study with 3.5 (short trips) and 2.9 (long trips) for before trip information behaviours compared to a similar before framing in the 1992 with 3.0 (short trips) and 1.9 (long trips).

4.2 Validating Vogt and Fesenmaier (1998)'s Information Needs Structure

A series of statistical analysis were conducted to assess the reliability of the information needs items and to compare the factor stability with Vogt and Fesenmaier (1998). As shown in Table 2, reliability tests using Cronbach's Coefficient Alpha indicates that all five constructs and its 15 sub-factors have acceptable levels of internal consistency (Coefficient alpha > 0.70) and are reasonably reliable based on the theoretical structures proposed by the earlier study. Although two factors (Sensory and Experiential) have a slightly lower coefficient values than the conventional criteria, some scholars (e.g., Sijtsma, 2009) argue that: (1) Cronbach's Coefficient Alpha is a lower bound to the "true" reliability, and (2) it is too sensitive to the number of items. Briggs and Cheek (1986, p. 116) suggest "the optimal level of homogeneity occurs when the mean inter-item correlation is in the 0.2–0.4 range" and the current study met this criterion. As such, it was

Table 2 Reliability of information need constructs

	# of items	Vogt and Fesenmaier (1998)[1] n = 305	Current study (Before the trip)[1] n = 414
Functional constructs	11	0.86	0.93
Knowledge	4	0.70	0.85
Utility	2	0.69	0.75
Efficiency	3	0.75	0.80
Uncertainty	2	0.84	0.83
Innovation construct	10	0.83	0.90
Novelty	3	0.60	0.78
Variety	3	0.64	0.73
Creativity	4	0.69	0.78
Hedonic construct	10	0.89	0.88
Emotional	3	0.69	0.73
Sensory	3	0.68	0.65
Experiential	2	0.69	0.59
Phenomenology	2	0.80	0.72
Aesthetic construct	5	0.77	0.81
Image	3	0.71	0.82
Fantasy	2	0.83	0.83
Sign construct	6	0.88	0.88
Advisory	2	0.93	0.89
Social	1	–	–
Symbolic	3	0.88	0.85

[1]*Note* Reliability values are Cronbach's Coefficient alpha

concluded that all five constructs and 15 sub-factors used in this study have shown its internal consistency and are used for further analysis.

4.3 Comparing the Current Study and Vogt and Fesenmaier (1998)

In order to understand the impact of information technology on traveller information needs, this study first compared the mean values of each information need construct and factor between the current study and Vogt and Fesenmaier (1998). To do so, this study conducted a series of independent sample t-tests based on summary statistics (e.g., mean, s.d., and sample size) reported in the original paper and the newly collected data. As shown in Table 3, the mean values for all four constructs (innovation, aesthetic, hedonic, and sign constructs) increased significantly as compared to the earlier study and only the functional construct was consistent in terms of rank across the two studies. The rankings across the five constructs changed only slightly. More specifically, the ranking of innovation construct decreased from the second (2) most important to fourth (4), whereas rankings of aesthetic and hedonic increased from 3 to 2 and from 4 to 3, respectively. The functional construct has the highest mean values and the sign construct has the lowest mean values for both studies.

Factor-level comparisons, however, show many important differences between the two studies. For the functional construct, the mean values for the two sub-factors (knowledge and efficiency) decreased, while the mean for utility increased significantly, as compared to those values for Vogt and Fesenmaier (1998). Uncertainty was found to be similar across the two studies. Also, the rankings of each factor in the functional construct are relatively high compared to other constructs. Regarding innovation construct, the mean values for two sub-factors (variety and creativity) increased significantly but the mean values for novelty showed no statistical difference. Within the aesthetic construct, the mean value for 'fantasy' increased significantly whereas the mean value for 'image' was consistent across the two studies. Additionally, the mean values for all four sub-factors in the hedonic construct increased statistically over the 1992 study; more specifically, the ranking of the experiential factor increased from 10 to 7. Finally, the mean value (and ranking) for the sign construct (e.g., social needs) decreased significantly whereas the means for two other subfactors (advisory and symbolic) increased.

4.4 Information Needs Before and During the Trip

The second step of the study focuses on the comparisons of information needs before and during the trip using the newly collected data. To do so, a multivariate

Table 3 Assessing changes in information needs over 25 years

	Vogt and Fesenmaier (1998) n = 305			Current study (before the trip) n = 414			Difference test	
	Mean	s.d	Rank	Mean	s.d	Rank	t-value	Diff.
Constructs-level								
Functional construct	5.81	0.87	1	5.76	1.12	1	0.74	–
Innovation construct	4.94	0.96	2	5.13	1.09	4	−2.52*	↑
Aesthetic construct	4.88	1.15	3	5.38	1.11	2	−5.83***	↑
Hedonic construct	4.56	1.20	4	5.15	1.12	3	−6.75***	↑
Sign construct	3.92	1.42	5	4.35	1.37	5	−4.09***	↑
Factor-level								
Functional construct								
Knowledge	6.03	0.91	1	5.85	1.23	1	2.26*	↓
Utility	5.38	1.35	7	5.75	1.32	2	−3.67***	↑
Efficiency	5.92	0.98	2	5.73	1.19	3	2.34*	↓
Uncertainty	5.65	1.32	4	5.67	1.32	5	−0.20	–
Innovation construct								
Novelty	5.46	1.01	6	5.52	1.20	6	−0.73	–
Variety	4.99	1.09	8	5.17	1.20	10	−2.10*	↑
Creativity	4.48	1.18	11	4.82	1.23	14	−3.75***	↑
Aesthetic construct								
Image	5.57	1.04	5	5.70	1.13	4	−1.60	–
Fantasy	3.81	1.77	14	4.90	1.56	12	−8.58***	↑
Hedonic construct								
Emotional	4.77	1.30	9	5.37	1.16	8	−6.40***	↑
Sensory	4.33	1.41	13	5.02	1.31	11	−6.68***	↑
Experiential	4.76	1.44	10	5.42	1.19	7	−6.53***	↑
Phenomenology	4.34	1.45	12	4.84	1.35	13	−4.71***	↑
Sign construct								
Advisory	3.53	1.79	16	4.10	1.70	16	−4.31***	↑
Social	5.69	1.41	3	5.34	1.66	9	3.05**	↓
Symbolic	3.54	1.63	15	4.18	1.54	15	−5.33***	↑

Note *** < 0.001, ** < 0.01, * < 0.05. All items were measured by seven-point Likert-type scales, ranging from 1 (strongly disagree) to 7 (strongly agree)

analysis of covariance (MANCOVA) was used to analyse mean differences between two groups with several covariates. Many earlier studies (e.g., Kim, Xiang, & Fesenmaier, 2015; Vogt & Fesenmaier, 1998) showed that gender, age, prior experience, efficacy, and attitude have strong impact on travellers' information

Table 4 Correlations between information need constructs and covariates

Covariates	Information need constructs[a]				
	F	I	H	A	S
I have travelled a lot in the Midwest	0.202***	0.235***	0.175***	0.172***	0.105**
I consider myself a well-travelled person	0.155***	0.271***	0.164***	0.197***	0.224***
I consider myself a skilled traveller	0.144***	0.232***	0.129***	0.141***	0.206***
I plan my entire vacation well in advance	0.259***	0.231***	0.162***	0.178***	0.209***
I take my vacations without much planning	−0.150***	−0.062	0.010	−0.002	−0.007
# of total trips to Midwest destinations	0.078*	0.147***	0.130***	0.094**	0.177***
Age	0.009	−0.070	−0.023	−0.092*	−0.002
Gender (0 = male; 1 = female)	0.161***	0.151***	0.172***	0.164***	−0.005

Note *** < 0.001, ** < 0.01, * < 0.05

[a]Headings: *F* Functional, *I* Innovation, *H* Hedonic, *A* Aesthetic, *S* Sign

searching behaviours. As such, this study first calculated bivariate correlations between information needs constructs and potential covariates suggested by earlier studies. As can be seen in Table 4, each of these factors are correlated significantly with all five information needs constructs. Therefore, this study included all eight variables as covariates for further analysis.

Two separate analyses using MANCOVA were conducted to assess the differences in information needs across the trip experiences (i.e., before and during the trip) at both the construct and factor level. Table 5 shows the mean values for three constructs differ significantly across the two stages. That is, the mean value for functional information needs are significantly higher and therefore more relevant for pre-trip planning than during the trip. On the other hand, innovation and hedonic information needs are significantly higher (and therefore more important) during the trip than before the trip. Among the 15 subfactors, the mean values for five subfactors (e.g., knowledge, efficiency, novelty, image, and social factors) are significantly higher before the trip, whereas mean values for four subfactors (e.g., utility, variety, emotional, and experiential factors) are significantly higher during the trip. These results clearly confirm previous research indicating that travellers' information needs differ significantly across the two decision contexts.

The last step in the study examined differences in information search behaviours (e.g., type, channel, sources, and devices used) across the two stages of the trip experience. Two types of information needs differ significantly between the two stages. Travellers who are planning their trip searched more frequently for the information about festivals and events, whereas on-the-go travellers searched for

Table 5 Importance of information needs across trip stages

	Timing of the trip		F-value
	Before (n = 414)	During (n = 413)	
Construct-level			
Functional construct	5.85	5.80	7.38**
Innovation construct	5.22	5.24	5.89*
Hedonic construct	5.22	5.27	4.78*
Aesthetic construct	5.41	5.34	3.31
Sign construct	4.40	4.46	2.28
Factor-level			
Functional construct			
Knowledge	5.97	5.94	8.07**
Utility	5.81	5.85	6.20*
Efficiency	5.83	5.78	6.39*
Uncertainty	5.70	5.49	1.05
Innovation construct			
Novelty	5.64	5.62	7.78**
Variety	5.26	5.30	4.17*
Creativity	4.88	4.91	3.64
Hedonic construct			
Emotional	5.42	5.43	5.53*
Sensory	5.07	5.16	2.21
Experiential	5.48	5.53	5.86*
Phenomenology	4.88	4.94	1.12
Aesthetic construct			*
Image	5.74	5.69	5.44
Fantasy	4.91	4.81	0.45
Sign construct			
Advisory	4.13	4.25	1.80
Social	5.42	5.36	4.36*
Symbolic	4.24	4.30	1.19

Note *** < 0.001, ** < 0.01, * < 0.05

restaurant information. Most official information channels were used similarly at both stages, except the visitor centre. Among several different information sources, only word of mouth (i.e., friends, family, and colleagues) was more frequently mentioned by travellers who were in before the trip stage than those in during the trip stage. Travellers in the later stage (i.e., during the trip) used more often local companies' advertisements, concierges, and outdoor signage/billboards. Additionally, while there were no significant differences in the use of desktop, laptop, and tablet computers, smartphone and navigation system/GPS were used significantly more often during the trip compared to usage at home before the trip.

5 Conclusions and Implications

The primary purpose of this study is to examine the extent to which travel information needs have changed over the past 25 years based upon the argument that the advent of the internet, social media and mobile systems has resulted in radical changes in the basic nature of the information search process. This analysis was achieved by comparing the results of the Vogt and Fesenmaier study (1998) with data recently collected using exactly the same information need and use scales. Further, the current study examined the differences in travellers' information needs *before* and *during* the trip, something the 1992 study did not do, based on the idea that the new mobile systems have fundamentally changed the role of information to support pre-trip planning to on-the-go travel decision making. The results indicate that the basic structure of travellers' information needs for pre-trip planning is essentially *stable* over the past 25 years, but there have been some slight but significant shifts in the absolute importance of several constructs. In particular, functional information needs remain most important for travellers (the mean value for foundation needs is the highest and did not differ significantly between the two time periods); and the mean values for the other information need constructs increased significantly compared to the earlier study. Additionally, the results indicate that significant differences exist in information needs between pre-trip planning and on-the-go planning (and decision making). These findings are consistent with recent studies suggesting that the internet has indeed, changed the way we search for and experience travel (Wang et al., 2014), but only to a limited extent in that travellers still rely mostly on functional information in guiding their travel decisions. The higher levels of information needs and use suggest that travellers are getting smarter as their smart phone assist them across trip planning at home and during their trip. While other types of information needs have gained agency, they are 'negotiated' by these practical aspects of travel planning. The relationships between the various information needs change slightly during the trip, wherein the importance of functional information decreases slightly while innovation and hedonic needs increase. Moreover, the 1990s findings suggest that travellers search for expert sources of information with social advice and state and community-based tourism initiatives while the 2016 findings suggest that travellers search for both experts and less formal social networks where travel information is being deposited and shared.

These findings are important in that they demonstrate the resiliency of human information processing systems even to the incredible affordances of current ICTs. The stability and relative importance of the various information needs should be understood within the lens of information processing theories, especially those within the dual processing family, which argue that individuals use two distinct information processing systems when making decisions, an effortful-processing mode (e.g. System 2) and an effortless-processing mode (e.g. System 1). Following Kahneman (2003), System 2 uses functional information through highly structured reasoning to evaluate which outcome is 'best' given the situation, whereas System 1

employs hedonic information and associative logic (and using hedonic information/cues) which supports quick or more spontaneous decision making that leads to experiential domains.

From a practical perspective, destination marketing strategies must continue to incorporate both types of information, but their emphasis should differ substantially depending upon how and when an information channel is being used so as to fulfil both the functional (and planning for core planning decisions) and the hedonic/experiential information needs of travellers *before* and *during* a trip. The emphasis depends upon when and how the particular channel is accessed by the traveller. Additionally, the results provide a useful foundation for improving the persuasive power of travel recommender systems where it is argued that these systems should be designed to accommodate both types of information *and* both types of information processing—functional information to meet the 'practical' and ordered aspects of decision making and hedonic information to meet the more emotionally (and quicker) based decisions which are typical of on-the-go travellers. As smart phone intelligence continues to develop, travellers will need to learn how to adapt in new environments that might not have searching capabilities. By considering a broad range of contexts, destination marketers can have a better understanding of traveller's information needs to be able to develop more effective and robust information ecosystems.

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Travellers and Their Joint Characteristics Within the Seven-Factor Model

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Abstract Recommender systems face specific challenges in the travel domain, as the tourism product is typically very complex. In addition, travelling can be seen as an emotional experience. Thus travel decisions are usually not only based on rational criteria but are rather implicitly given. Therefore sophisticated user models are required. In this paper it is analysed in detail whether the seven-factor model is capable of differentiating between different groups of users in an accurate way. Within this model each user is described with respect to seven travel behavioural patterns that account for both tourist roles and personality traits of a user. To identify groups of travellers, individual attributes are used and also a cluster analysis is conducted. With the help of statistical analyses clear evidence is provided that the seven-factor model is capable of distinguishing between different groups of users in a meaningful and effective way.

Keywords User modelling · Personality-based recommender systems · Cluster analysis

1 Introduction

During the last decades, the tourism domain has been strongly shaped by the fast development of information and communication technologies (ICT) in general and the World Wide Web in particular. Since the emergence of the Web 25 years ago, travel and tourism have been major application domains for Web-related services (Werthner & Klein, 1999). As a consequence, also the way in which people make their travel decisions has dramatically changed. Travellers are researching and booking their trips predominantly online. In 2013, for instance, already more than

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three-quarters of European travellers booked their vacations on the Web (European Travel Commission, 2013). The Web enables customers to compose their travel packages individually in order to fit their specific needs and preferences. Along with these benefits, however, the problem of information overload might occur.

Recommender systems can help to address this problem by supporting people in dealing with the vast amounts of available information. The aim of such systems is to "provide suggestions for items that are most likely of interest to a particular user" (Ricci, Rokach, & Shapira, 2015). However, in the context of travel and tourism this task is particularly challenging as the products typically have a high complexity and intangibility; a trip usually comprises a bundle of interconnected products (e.g., means of transportation, accommodations, activities) that have a limited availability and where contextual factors often play a crucial role (e.g., weather, time of the year, social aspects) (Fesenmaier, Kuflik, & Neidhardt, 2016). In addition, travellers are often not able to phrase their needs and preferences explicitly, in particular in the early phase of the decision making process (Zins, 2007). Furthermore, travelling is an emotional experience. As a consequence, travel decisions are typically not only based on rational criteria but are rather implicitly given. Thus coming up with a comprehensive user model is a key issue in the design of tourism recommender systems. One way to address this challenge are personality-based approaches. It has been shown that user preferences can be related to the personality of a user and that recommender systems can successfully exploit this relationship (Tkalcic & Chen, 2015) also in the area of tourism (Braunhofer, Elahi, Ge, & Ricci, 2014).

In Neidhardt, Seyfang, Schuster and Werthner (2015) personality traits are combined with tourist roles in order to determine the profile of a user within a tourism recommender system. The aim is to include both short-term behaviour (captured by 17 tourist roles) and long-term preferences (captured by the "Big Five" personality traits) within one model. This has been accomplished by a factor analysis on the 17 tourist roles and the "Big Five" traits leading to a seven-factor solution. These factors represent the travel behavioural patterns *Sun & Chill-Out*, *Knowledge & Travel*, *Independence & History*, *Culture & Indulgence*, *Social & Sport*, *Action & Fun*, and *Nature & Recreation*, and form the basis of a seven dimensional space. The travel profile of a user can, in turn, be interpreted as a mixture of the seven factors.

Taking this as a starting point, the aim of this work is to analyse in detail what insights can be gained by such a representation. With the help of statistical analyses, in particular, it is investigated whether the representation of the users with respect to the seven basic factors is capable of differentiating between different groups of users. These groups are obtained in two ways. First, groups of users based on individual attributes are distinguished. Second, a machine learning approach, i.e., k-means cluster analysis, is applied to identify different groups of users.

The rest of the paper is organized as follows: In Sect. 2 related work on tourist roles is presented. Furthermore, the seven-factor model is explained in more detail. In Sect. 3, the data sample is described. In Sect. 4 statistical analyses based on the individual attributes of the users are conducted and discussed. In Sect. 5 the cluster analysis is presented. In Sect. 6 the main insights are summarized and conclusions are drawn.

2 Related Work

2.1 Tourist Roles

The relation between touristic behavioural patterns and psychological needs and expectations has been a focus of research since the early 1970s. Cohen (1972) tried to establish a relationship between the travel behaviour of a person on the one hand and his or her interests, needs and social environment on the other hand. Furthermore, first categorizations of travel roles were established (Cohen, 1974; Pearce, 1982).

One of the most important frameworks in this context was introduced by Yiannakis and Gibson (1992). In this framework, 15 tourist roles were distinguished: *Action Seeker*, *Active Sport Tourist*, *Anthropologist*, *Archaeologist*, *Drifter*, *Educational Tourist*, *Escapist*, *Explorer*, *High Class Tourist*, *Independent Mass Tourist*, *Jetsetter*, *Organized Mass Tourist*, *Seeker*, *Sun Lover*, and *Thrill Seeker*. A questionnaire was developed to assign these tourist roles to travellers; it comprised two questions per role, i.e., 30 questions in total. A follow-up study is presented in Gibson and Yiannakis (2002) focusing on the relation between the tourist roles and psychological needs for both genders over lifetime. Statistical evidence was given that touristic behaviour is related to psychological needs and that it changes over time. Based on new findings, moreover, Gibson and Yiannakis decided to sub-divide two of their 15 original tourist roles, i.e., *Escapist* and *Independent Mass Tourist*, into two categories each resulting in 17 different tourist roles. Using the categorization of Yiannakis and Gibson, Yfantidou (2008) examined differences in tourist role preferences of travellers in Greece with respect to both genders and varying age.

Gretzel, Mitsche, Hwang, and Fesenmaier (2004) used a different categorization and studied the impact of twelve travel personality types (i.e., *Culture Creature, City Slicker, Sight Seeker, Family Guy, Beach Bum, Avid Athlete, Shopping Shark, All Arounder, Trail Trekker, History Buff, Boater* and *Gamer*) on the choice of travel activities and destinations in the US.

It has been shown that tourist roles can be related to personality traits of travelers. Here, in particular, the well-established "Big Five" model of personality has been considered, which comprises the traits *extraversion*, *agreeableness*, *conscientiousness*, *neuroticism*, and *openness to experience* (Goldberg, 1990). Jani (2014) identified a number of significant relationships between the "Big Five" and the travel personality types studied in Gretzel et al. (2004). Also in Delic, Neidhardt, and Werthner (2016) significant relationships between the "Big Five" traits and tourist roles could be detected. However, here the 17 tourist roles introduced by Gibson and Yiannakis (2002) were considered. Furthermore, complementary analyses were conducted for different age groups and genders.

2.2 Seven-Factor Model

The tourist roles of Gibson and Yiannakis (2002) aim to capture current or short-term travel behavioural patterns of individuals. Personality traits on the other hand are known to be stable over time and thus represent long-term preferences of a person (Woszczynski, Roth, & Segars, 2002). To account for both aspects within a personality-based tourism recommender system, the following procedure was applied (Neidhardt et al., 2015):

1. A questionnaire was developed addressing both the 17 tourist roles and the "Big Five." Standard questions for both aspects were available. The questions were phrased as statements that had to be rated on a five-level Likert-scale. Furthermore, demographic information such as age and gender had to be indicated. The questionnaire was available as online as well as offline version. Overall, 553 persons completed the offline questionnaire. These participants were randomly selected in crowded places in Vienna as well as in trans-regional trains within Austria. The online questionnaire, on the other hand, was distributed via Social Media, and completed by 444 participants. Thus, in total 997 questionnaires were obtained. It took approximately six month to collect these data.
2. A factor analysis was conducted on the 997 completed questionnaires. The 22 initial variables (i.e., 17 tourist roles and "Big Five" traits) resulted in a seven-factor solution. These factors represent the travel behavioural patterns *Sun & Chill-Out*, *Knowledge & Travel*, *Independence & History*, *Culture & Indulgence*, *Social & Sport*, *Action & Fun*, and *Nature & Recreation.* Furthermore, the seven factors form the basis of a vector space, in which the user profiles can be located. Thus the travel profile of a user can be interpreted as a mixture of these seven basic factors.
3. Also tourism products can be represented with respect to the seven factors, which was in the beginning done by experts. This representation allows to calculate the distances (e.g., the Euclidian distance) between a user profile and the tourism products. The recommender system presents those products to a user, which are closest to his or her user profile.

Pictures are used, moreover, to determine the individual user profiles. To integrate the pictures into the model, several steps were required (Neidhardt, Schuster, Seyfang, & Werthner, 2014). First, more than 100 pictures that relate to one or more of the seven factors were pre-selected and pre-processed in different workshops. This picture selection was tested with the help of a user study with 105 participants. Based on this study, moreover, the number of pictures could be reduced to 63. In a next step, different experts assigned subsets of the 63 pictures to each of the above mentioned tourism products. By relating the representations of the tourism products with respect to the seven factors to the pictures that got assigned to these products, seven regression models could be fitted, i.e., one for each factor. These models can be used, in turn, to map the picture selection of a user into the vector space. Thus the overall procedure is designed in a way that the travel profile of a user, which is a mixture of the seven basic factors, can be deduced from a number of appealing pictures that he or she selects.

3 The Data Sample

The aim of this paper is to examine the resulting seven-dimensional vector space (see Sect. 2.2) and the positions of the travellers within this space in more detail.

The data sample comprises 997 individuals, who answered the previously described questionnaire. Out of these 997 participants, 486 (48.7%) are female and 511 (51.3%) are male. In our sample, the majority is rather young. In Table 1 the distribution of the participants with respect to six age groups is listed.

It can be seen that the largest age group comprises the 20–29-year-olds (375 participants or 37.6%; in the following discussion, abbreviated as "20–29"); the second largest age group comprises the 30–39-year-olds (213 participants or 21.4%; abbreviated as "30–39"); the third largest age group comprises the 40–49-year olds (139 participants or 13.9%; abbreviated as "40–49"), and the fourth largest age group comprises the 50–59-year olds (113 participants or 11.3%; abbreviated as "50–59"). On the other hand, the second smallest age group consists of participants that are 19 years or younger (82 participants or 8.2%; abbreviated as "0–19") and the smallest age group comprises participants of 60 years or older (75 participants or 7.5%; abbreviated as "60 plus").

The seven-factor solution was obtained based on the answers of the participants to the questionnaire (see Sect. 2.2). Additionally, as a result of the factor analysis, the individuals were mapped into the newly constructed vector space (Marsland, 2014), i.e., we obtained for each participant a score for each of the seven factors. Thus these scores determine the positions of the participants in the vector space and constitute the user profile with respect to the seven factors. In Table 2 the distribution of the factor scores are listed. The mean value is 0 for all factors. The factor *Sun & Chill-Out*, covers the highest range of user scores; the factor *Nature & Recreation* the lowest.

Table 1 Age distribution of the participants

Age Group	0–19	20–29	30–39	40–49	50–59	60 plus
Number (Percentage)	82 (8.2%)	375 (37.6%)	213 (21.4%)	139 (13.9%)	113 (11.3%)	75 (7.5%)

Table 2 Factor score distributions of the participants

	Mean (SD)	Minimum	Maximum	Range
Sun & Chill-Out	0.00 (0.87)	−3.89	2.54	6.43
Knowledge & Travel	0.00 (0.81)	−2.51	2.71	5.23
Independence & History	0.00 (0.87)	−2.14	2.70	4.84
Culture & Indulgence	0.00 (0.83)	−1.67	3.02	4.69
Social & Sport	0.00 (0.95)	−2.04	2.66	4.70
Action & Fun	0.00 (0.89)	−3.35	2.01	5.36
Nature & Recreation	0.00 (0.84)	−2.32	1.92	4.24

4 User Profiles and Individual Characteristics

This section aims to study differences with respect to the seven factors between age groups on the one hand and gender on the other hand.

In Table 3 means and standard deviations (SD) of the user scores per factor are listed for all age groups. When comparing the mean factor scores across different age groups, clear differences for most of the factors can be detected. In the youngest age group, i.e., below 20 years, the average scores for *Sun & Chill-Out*, *Knowledge & Travel* and *Nature & Recreation* are lower than the respective average in the entire sample. On the other hand, members of this age group score on average high with respect to *Culture & Indulgence* and *Social & Sport*. People in the age group 20–29 years score comparably low with respect to *Sun & Chill-Out* and *Nature & Recreation*. On the other hand, people in their twenties score on average high with respect to *Knowledge & Travel* and *Social & Sport*. People between 30 and 39 years typically enjoy *Sun & Chill-Out* as well as *Nature & Recreation.* People in the age 40–49 years like on average *Nature & Recreation* and score low with respect to all the other factors except for *Sun & Chill-Out.* People between 50 and 59 years also score on average high with respect to *Nature & Recreation*. On the other hand, they score negative with respect to *Action & Fun* and clearly dislike *Social & Sport*. Also people in the age group 60 plus typically dislike *Social & Sport*. They also score on average negative with respect to *Nature & Recreation* and *Action & Fun*.

To see which of these differences are statistically significant, pairwise *t*-tests with *p*-value adjustment (Holm, 1979) are conducted. For the factor *Sun & Chill-Out* it turns out that the age group 20 to 29 with an average of −0.07 scores significantly lower than the age group 30–39 with an average of 0.16 ($p < 0.05$). For the factor

Table 3 Average factor scores (and SD) in different age groups (bold numbers indicate significant differences between that and at least one other age group)

	0–19	20–29	30–39	40–49	50–59	60 plus
Sun & Chill-Out	−0.15 (0.81)	**−0.07 (0.87)**	**0.16 (0.83)**	0.02 (0.95)	−0.04 (0.89)	0.06 (0.84)
Knowledge & Travel	**−0.22 (0.85)**	**0.13 (0.91)**	−0.04 (0.84)	**−0.20 (0.73)**	−0.02 (0.76)	0.12 (0.66)
Independence & History	0.05 (0.94)	0.06 (0.85)	−0.03 (0.91)	−0.14 (0.77)	−0.01 (0.90)	0.02 (0.83)
Culture & Indulgence	**0.30 (0.86)**	**−0.02 (0.89)**	−0.02 (0.88)	**−0.14 (0.75)**	−0.02 (0.79)	0.10 (0.89)
Social & Sport	**0.49 (0.77)**	**0.24 (0.77)**	**−0.05 (0.76)**	**−0.13 (0.77)**	**−0.53 (0.60)**	**−0.55 (0.67)**
Action & Fun	0.03 (0.72)	**0.10 (0.69)**	**0.04 (0.66)**	**−0.22 (0.66)**	−0.11 (0.71)	0.05 (0.75)
Nature & Recreation	**−0.36 (1.03)**	**−0.08 (0.73)**	**0.11 (0.75)**	**0.15 (0.70)**	**0.20 (0.80)**	−0.09 (0.72)

Knowledge & Travel the results show that the age group 20–29 with an average of 0.13 scores significantly higher than the age group 0–19 with an average of −0.22 ($p < 0.01$) as well as the age group 40–49 with an average of −0.20 ($p < 0.01$). For the factor *Culture & Indulgence* it turns out that the age group 0–19 with an average of 0.3 scores significantly higher than the age groups 20–29 and 40–49 with an average of −0.02 ($p < 0.05$) and −0.14 respectively ($p < 0.01$). For the factor *Social & Sport* clear and highly significant ($p < 0.001$) differentiations to most of the age group are detected. Only between the age groups 30–39 and 40–49 and between the age groups 50–59 and 60 plus respectively no differences are identified. The age group comprising the youngest users has the highest average score, namely 0.49. The scores are then decreasing, i.e., the older the users the lower their average factor score. This is also displayed in Fig. 1. For the factor *Action & Fun* the results show that the age group 40–49 with an average of −0.22 scores significantly lower than the age groups 20–29 with an average of 0.10 ($p < 0.001$) and the age group 30–39 with an average score of 0.04 ($p < 0.01$). For the factor *Nature & Recreation* it turns out that the age group 0–19 with an average of −0.36 scores significantly lower than all other age groups but 60 plus. There are also significant differences between the age group 20–29 with an average of −0.08 to all the other age groups but 60 plus.

Thus, except for *Independence & History* each factor can differentiate between one or more pairs of age groups. As a consequence, there are clear pairwise differences for most of the age groups with respect to one or more factors. Only between the age groups 50–59 and 60 plus no significant differences can be identified. One reason might be the small size of the age group 60 plus. However, further investigations are required. It can be seen, moreover, that only one factor, i.e., *Social & Sports* is chancing linearly with age, i.e., the higher the age, the less

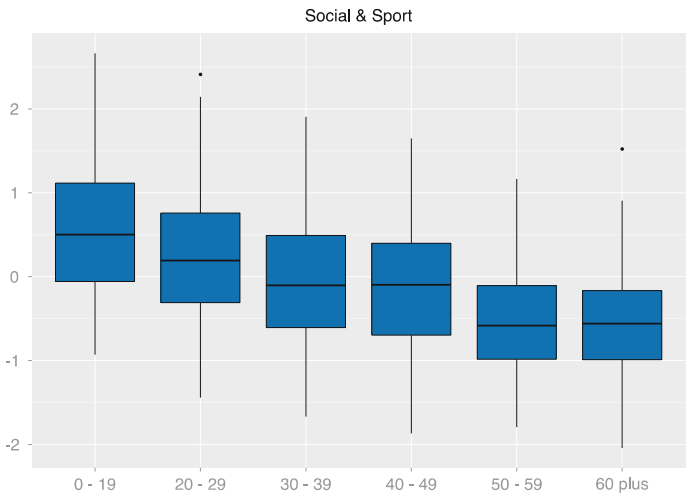

Fig. 1 Score distributions of the different age groups with respect to *Social & Sport*

attractive this aspect. However, other factors show a more complex relationship to the age groups. This might be related to different needs in different stages of life. For instance, the 30–39 year-olds might particularly seek for *Sun & Chill-Out* to compensate for their stressful everyday work.

Next, gender is considered. Here, the differences are significant for *Sun & Chill-Out*, where females score on average higher than male users (0.11 vs. −0.10; $p < 0.001$); this is still valid in each of the three biggest age groups. Also with respect to the factor *Independence & History* female travellers score on average significantly higher (0.08 vs. −0.07; $p < 0.01$). Thus, with respect to gender *Independence & History* makes a difference whereas this factor is not capable of distinguishing between age groups. With respect to *Social & Sport*, females score on average much lower than males (−0.16 vs. 0.15; $p < 0.001$); this result is valid, moreover, in each age group but the youngest one, i.e., the age group 0–19 years. This analysis shows that gender roles affect travel preferences as certain patterns can be detected.

5 User Profiles and Clusters

In a next step a machine learning approach is used to identify sub-groups of users who share similar travel preferences and behavioural patterns. Specifically, k-means clustering (Marsland, 2014) is applied. In Fig. 2 the screen plot is displayed.

Based on this, four, five and six cluster solutions are considered. In the end, the six cluster solution is fixed, also because of its interpretability. In Table 4 the cluster means and standard deviations (SD) with respect to the factors are listed.

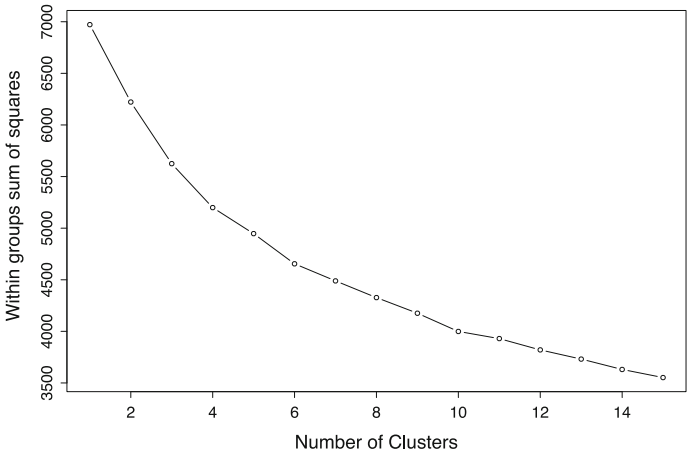

Fig. 2 Scree plot to determine an appropriate number of clusters

Table 4 Average factor scores (and SD) in different clusters

	C1	C2	C3	C4	C5	C6
Sun & Chill-Out	0.40 (0.86)	0.57 (0.80)	−0.06 (0.82)	−1.10 (0.97)	0.26 (0.68)	−0.19 (0.93)
Knowledge & Travel	−0.52 (0.81)	0.57 (0.87)	0.98 (0.78)	−0.18 (0.81)	−0.46 (0.81)	−0.36 (0.84)
Independence & History	−0.62 (0.73)	1.08 (0.73)	−0.29 (0.79)	0.60 (0.92)	−0.18 (0.87)	−0.39 (0.80)
Culture & Indulgence	−0.37 (0.66)	0.60 (0.95)	−0.44 (0.72)	−0.50 (0.67)	−0.32 (0.64)	1.46 (0.77)
Social & Sport	−0.10 (0.94)	−0.05 (0.88)	0.83 (0.80)	−0.31 (0.92)	−0.66 (0.79)	0.34 (0.94)
Action & Fun	0.68 (0.77)	0.18 (0.90)	0.34 (0.76)	−0.83 (1.00)	−0.31 (0.86)	−0.25 (0.94)
Nature & Recreation	0.68 (0.71)	0.43 (0.74)	−0.08 (0.83)	0.49 (0.80)	−0.97 (0.70)	−0.66 (0.94)
Cluster Size	197	150	179	159	177	135

It can be seen that cluster C1 comprises people who like *Action & Fun* as well as *Nature & Recreation*. Furthermore, *Sun & Chill-Out* is important to them. In their holidays, this people do not look for aspects related to *Independence & History* or *Knowledge & Travel*. Also *Culture & Indulgence* is not important to them. For people belonging to cluster C2, on the other hand, *Independence & History* is very important. Moreover, they like *Knowledge & Travel* and *Sun & Chill-Out* as well as *Nature & Recreation*. The most important aspects for people in cluster C3 are *Knowledge & Travel* as well as *Social & Sport*. Furthermore, they appreciate *Action & Fun*. Those people are not interested in *Culture & Indulgence* or *Independence & History*. People in cluster C4, on the other hand, show interest in *Independence & History*. Furthermore, they like *Nature & Recreation*. They do not want to spend their holidays with *Sun & Chill-Out* or *Action & Fun*. Also *Culture & Indulgence* is not of interest. In cluster C5 people are pooled together who basically disapprove all aspects but *Sun & Chill-Out*. Cluster C6, finally, comprises people who particularly like *Culture & Indulgence.* Also *Social & Sport* is important to them. On the other hand, they try to avoid *Nature & Recreation.*

Statistical tests (i.e., pairwise *t*-test with p-value adjustment) clearly show that there are strong and significant differences between the clusters with respect to the seven factors: *Sun & Chill-Out* shows significant differences between all pairs of clusters but C1 and C2, C1 and C5 as well as C3 and C6. *Knowledge & Travel* shows significant differences between all pairs of clusters but C1 and C5, C1 and C5, C4 and C6 as well as C5 and C6. *Independence & History* shows significant differences between all pairs of clusters but C3 and C5, C3 and C6, as well as C5 and C6. *Culture & Indulgence* shows significant differences between all pairs of clusters but C1 and C3, C1 and C4, C1 and C5, C3 and C4, C3 and C5 as well as C4 and C5. *Social & Sport* shows significant differences between all pairs of clusters but C1 and C2. *Action & Fun* shows significant differences between all

pairs of clusters but C2 and C3 as well as C5 and C6. Finally, *Nature & Recreation* shows significant differences between all pairs of clusters but C2 and C4.

Summing up, all pairs of clusters are different with respect to one or more of the seven factors. This implies that people belonging to a certain cluster or group exhibit distinct travel behavioural patterns compared to people belonging to the other clusters. Based on this insight a thoroughly characterisation of each cluster can help to better understand the similarities among the people in one cluster in order to target them more accurately, e.g., by a recommender system. Thus, the obvious next steps are to examine how age and gender are distributed among the identified clusters.

In Table 5 the distributions of the different age groups in the distinct clusters is shown; clear differences became apparent. In cluster C1 the three age groups 30–39, 40–49 and 50–59 year olds are over-represented compared to the overall population. In cluster C2 people that are younger than 30 are slightly under-represented; and the 40–49 year olds are under-represented as well. On the other hand, the 30–39 year olds are clearly over-represented in that cluster. They constitute 28% whereas in the overall population they only constitute 21.4% of the people. Also the 50–59 year olds and the age group 60 plus are slightly over-represented. Cluster C3 mainly comprises people in their twenties; 58.1% of the individuals in the cluster belong to this age group whereas in the overall population people of this age only constitute 37.6%. In cluster C4 the age groups 40–49 and 50–59 are clearly over-represented; the former constitutes 21.4% of this cluster (compared to 13.9% in the overall population) and the latter 17.6% (compared to 11.3% in the overall population). In cluster C5 people who are 40 years and more are over-represented. In particular, the age group 60 plus comprises 15.3% of this cluster whereas in the overall population they only constitute 7.5%. Finally, in cluster C6 the 0–19 year olds are strongly over-represented. In the overall population they only account for 8.2% but in cluster C6 for 19.3%. Also the 40–49 year olds are slightly over-represented in that cluster.

Table 5 Distribution of the different age groups in the different clusters

	C1	C2	C3	C4	C5	C6	All
0–19	11 (5.6%)	11 (7.3%)	13 (7.3%)	10 (6.3%)	11 (6.2%)	26 (19.3%)	82 (8.2%)
20–29	66 (33.5%)	54 (36%)	104 (58.1%)	49 (30.8%)	55 (31.1%)	47 (34.8%)	375 (37.6%)
30–39	51 (25.9%)	42 (28%)	39 (21.8%)	27 (17%)	29 (16.4%)	25 (18.5%)	213 (21.4%)
40–49	32 (16.2%)	9 (6%)	13 (7.3%)	34 (21.4%)	29 (16.4%)	22 (16.3%)	139 (13.9%)
50–59	26 (13.2%)	21 (14%)	6 (3.4%)	28 (17.6%)	26 (14.7%)	6 (4.4%)	113 (11.3%)
60 plus	11 (5.6%)	13 (8.7%)	4 (2.2%)	11 (6.9%)	27 (15.3%)	9 (6.7%)	75 (7.5%)
Cluster Size	197	150	179	159	177	135	997

Regarding gender, there are 48.7% females and 51.3% males in the entire sample. Women are clearly over-represented in cluster C2 (58%) and in cluster C5 (55.9%) and slightly over-represented in cluster C1 (49.7%). Men, on the other hand are clearly over-represented in cluster C3 (60.9%) and cluster C4 (58.5%). In cluster C6 the female/male distribution corresponds to the overall gender distribution.

Hence, each cluster can be described along different dimensions, e.g. cluster C4 combines the travel aspects *Independence & History* and *Nature & Recreation*. In this cluster, the 40–59 year olds are stronger represented than in the overall sample. Also male travellers are over-represented. Thus, bringing all these aspects together can foster a more comprehensive and detailed understanding of complex relationships between travel behavioural pattern, age and gender. These insights can be directly put into practice, for example within tourism recommender systems but also for e-marketing purposes.

6 Conclusions

In this paper the representation of travel related behaviours and preferences with respect to the seven basic factors *Sun & Chill-Out*, *Knowledge & Travel*, *Independence & History*, *Culture & Indulgence*, *Social & Sport*, *Action & Fun*, and *Nature & Recreation* was examined in detail. These factors aim to combine travel roles from literature and individual personality traits and constitute the user model within a personality-based travel recommender system (Neidhardt et al., 2015). One main reason for the dimensionality reduction, i.e., the factor analysis, was to introduce a computational model, which is efficient and applicable on a large scale. However, in this paper it was illustrated that the advantages of seven factors compared to 22, i.e., the 17 tourist roles and the "Big Five" traits, go beyond performance. It could be shown that the seven factors are capable of distinguishing among different groups of users in a clear and effective way. This is true for groups that are formed based on individual characteristics such as age and gender but also for groups that are identified with the help of machine learning techniques. Dimensionality reduction helps to reduce noise in the data (Marsland, 2014), which leads to a better interpretability and new insights into the social setting (Le Roux & Rouanet, 2004). This becomes apparent by the results of our analyses. These results confirm that the seven-factor model is a meaningful way to represent user profiles within a computational model. It shows in particular that different groups of users can be well distinguished and targeted, e.g., by a recommender system, which is a key aspect in the design of sophisticated user models in IT applications (Werthner et al., 2015).

Clearly, also in related work it has been shown that tourist roles and preferences are changing with age and that there are differences with respect to gender (Gibson & Yiannakis, 2002; Yfantidou, 2008). However, these studies usually consider a higher number of tourist roles, which makes it harder to study the results

systematically, to remove noise and to identify overall patterns. Also the personality of the travellers is typically not considered in these studies. As opposed to this, our model, which accounts for both travel roles and personality traits, is very handy, as only seven factors, which capture enough variance of the underlying data, have to be considered.

In future work, additional user characteristics and their impact on the travel behavioural patterns will be studied. One focus, in particular, will be the analysis of cultural differences of travellers with respect to the seven basic factors.

Furthermore, as pictures are used to elicit the preferences of the user in our travel recommender system, it is also planned to conduct an in-depth analysis how individual characteristics and the cluster, which the user belongs to, impact the picture selection of that user. This might help to further improve our user model in order to better address the users' needs.

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Antecedents of Travellers' Satisfaction and Purchase Intention from Social Commerce Websites

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Abstract The popularity of social commerce websites (SCW) is constantly growing among consumers, who are increasingly adopting them before buying tourism services. Understanding the factors that influence traveller's decisions to purchase from SCWs is of critical significance for evaluating their impact in the travel industry. This study draws upon the Delone and McLean's (1992) Information System Success Model (ISSM) to investigate the factors that affect purchase intention. Predictions were tested with data from 119 users of Tripadvisor using structural equation modelling. Findings reveal that information quality affects both system quality and satisfaction. System quality also influences satisfaction, which ultimately influence purchase intention from a SCW.

Keywords Online consumer reviews · Delone and McLean · Information systems success model · Social commerce · Customer satisfaction

1 Introduction

A growing number of consumers are increasingly consulting consumer reviews before making any purchase decision. Travel reviews have radically changed the way tourists plan their trips (Buhalis & Law, 2008; Sigala, Christou, & Gretzel, 2012) as travellers trust anonymous reviewers more than other sources of information

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(Gretzel & Yoo, 2008; Dickinger, 2011; Sparks, Perkins, & Buckley, 2013; Filieri, 2016). Research in the travel and tourism industry has also shown that consumer reviews affect hotel sales (e.g., Ye, Law, & Gu, 2009), and influence travellers' decisions (Filieri & McLeay, 2014; Sparks & Browning, 2011; Vermeulen & Seegers, 2009; Yoo & Gretzel, 2008), perceived website trust (Filieri, Alguezaui, & McLeay, 2015), and travellers' choice (Arsal, Backman, & Baldwin, 2008).

E-commerce operators are increasingly enabling users to leave account of their experience in the form of consumer reviews, giving birth to the so-called social commerce model (Huang & Benyoucef, 2013). Social commerce is defined as an Internet-based commercial application, leveraging social media and Web 2.0 technologies which support social interaction and user-generated content in order to assist consumers in their decision making and acquisition of products and services within online marketplaces and communities (Huang & Benyoucef, 2013) or as word-of-mouth applied to e-commerce (Dennison, Bourdage-Braun, & Chetuparambil, 2009). Social commerce uses core web 2.0 features such as user-generated content and sharing of content (Huang & Benyoucef, 2013). The main elements of social commerce websites include the presence of an online community of consumers that interact among them (Kim & Srivastava, 2007), the approach of theses websites is thus more social and interactive so that consumers can voice their opinions with other customers as well as with businesses (Parise & Guinan, 2008). Examples of social commerce websites in the travel industry include Tripadvisor.com, which has recently adopted the social commerce business model, selling directly rooms and restaurant places to their users, who can interact and write reviews of their experience.

The growth of SCWs has driven interest among scholars and practitioners seeking to better understand the peculiarities of these websites and how these affect consumer behaviour. Little research has been undertaken in tourism to investigate the factors that trigger travellers' purchase intention from social commerce websites.

In this study we adopt DeLone and McLean's (1992) Information Systems Success Model (ISSM), which has received scarce attention in the general e-WOM literature, to predict the antecedents of travellers' decision purchase from SCWs. DeLone and McLean's (1992) model includes the constructs of information quality, website system quality, usage, and satisfaction and postulates that information quality and system quality both influence user satisfaction and the use of information systems (IS), which are considered to be important antecedents of net benefits (purchase intention in this case) of IS at an individual user level (DeLone & McLean, 1992). Following DeLone and McLean (1992) we assess the nature of the influence of both the website system quality and information quality on consumer satisfaction and purchase intention (individual impact) from a SCW. To date, no empirical study has adopted the DeLone and McLean (1992) in e-WOM research or has investigated the constructs used in this study in a single framework. We use structural equation modelling to test hypotheses using a sample of 119 users of TripAdvisor. In addition to our theoretical contributions, the results of this study provide online managers with recommendations regarding the factors that contribute to increased travellers' satisfaction and purchase intention within SCWs.

2 Consumer Reviews in Social Commerce Websites

One of the main reasons why consumers use websites that enable customers to publish reviews is to improve their decision making by accessing reliable and accurate information provided by other customers who have already experienced the products and services they are planning to buy (Yoo & Getzel, 2008).

Social commerce is a new phenomenon in e-commerce using social media to provide social interaction to e-commerce platforms (Hajli, 2014). Existing researches in tourism have mainly focused on travel communities or have attempted to investigate the antecedents of consumers' motivation to use consumer-generated media. For instance, scholars have also investigated the reasons why they adopt information from online consumer reviews (Filieri & McLeay, 2014), and the role online reviews play in reducing travellers' perceptions of risk when booking accommodation (Gretzel, Yoo, & Purifoy, 2007). Ayeh, Au, and Law (2013) has adopted the Technology Acceptance Model (TAM) to explain travellers' use of consumer-generated media (CGM) for travel planning, focusing on the importance of factors like usefulness, ease of use, homophily, perceived trustworthiness, and perceived enjoyment.

However, no study to date has adopted the DeLone and McLean's (1992) Information Systems Success Model (ISSM) to investigate adoption in the literature on user-generated content. In order to fill this gap, this study adopts this framework and adapts it to the SCWs context.

3 The DeLone and McLean's Information Systems Success Model (ISSM)

In order to understand the antecedents of purchase intention from SCW, we have adopted the ISSM (DeLone & McLean, 1992) to formulate hypotheses for this study. After reviewing the literature on the antecedents of IS success, DeLone and McLean (1992) developed a theoretical model to test the success of information systems implemented within organizations. The ISSM proposes that the individual impact of an IS is determined by a user's usage of a system and their level of satisfaction with the system. In the ISSM, information quality and system quality are important antecedents of IS success. The ISSM has made a significant contribution to academic knowledge by proposing that IS success measures are multidimensional and that there are causal relationships among these dimensions (Lin & Huang, 2008; Lin, 2008). The validity of the model has been widely accepted in IS research (e.g., Rai, Lang, & Welker, 2002; Nelson, Todd, & Wixom, 2005; Wixom & Todd, 2005; Wu & Wang, 2006). Although the original DeLone and McLean (1992) model was developed for examining the determinants of IS success, it has been adapted to measure the success of e-commerce websites (Molla & Licker, 2001; Maditinos & Theodoris, 2010).

Fig. 1 Research model

In tourism research, there is a dearth of studies on the factors driving travellers' intentions to use SCWs. Previous studies have adopted the Technology Acceptance Model (TAM) to explain travellers' use of consumer-generated media (CGM) for travel planning and have focused on the importance of factors like homophily, perceived expertise, perceived trustworthiness, and perceived enjoyment (Ayeh et al., 2013). Instead in this study we apply the DeLone and McLean's (1992) model to measure the determinants of use, satisfaction, and adoption of recommendation from travel reviews from SCWs. Our framework hypothesises that both information and website system quality exercise a positive and significant influence on recommendation adoption through the mediation of customer satisfaction. We expect that the semantic quality of the information provided within a SCW and the operational quality of the system facilitate the search and retrieval of relevant information that will guide customers in their decision making process.

We illustrate the model and the hypothesized relationships in Fig. 1. The resulting model builds on five constructs that correspond to the factors of the ISSM (DeLone & McLean, 1992).

4 Hypotheses Development

4.1 Information Quality

Information quality is defined as 'the quality of the content of a consumer review from the perspective of information characteristics' (Park, Lee, & Han, 2007, p. 128). In this study information quality refers to the quality of the information contained in consumer reviews. Research in the e-WOM literature has mainly focused on how information quality influences consumer purchase intentions (Park et al., 2007; Lee et al., 2008), trustworthiness (Filieri, 2016); information usefulness (Cheung, Lee, & Rabjhon, 2008), and information adoption (Filieri & McLeay, 2014), while neglecting to assess the relationship between consumer review informational quality and satisfaction. However, the relationship between information

quality and user satisfaction is strongly supported in IS literature (e.g., Rai et al., 2002; Wu & Wang, 2006; Wixom & Todd, 2005; Zheng et al., 2013). Higher quality information means that travel consumers will find reviews containing accurate, current information that fit their needs, and for that reason they will be more satisfied with using SCW. Thus, we hypothesize:

H1*—There is a positive relationship between the quality of the information contained in online consumer reviews and traveller's satisfaction with a SCW.*

Consumers use online review websites mainly to retrieve information about the hotels and restaurants they plan to book from previous customers. Thus, the most important resource of these websites for the traveller is information. If travellers retrieve accurate, timely, relevant for their needs they will develop a positive attitude towards the SCW and will evaluate the website based on the level of quality of the information contained in online consumer reviews. Thus, we hypothesize as follows:

H2*—There is a positive relationship between the quality of the information contained in online consumer reviews and system quality.*

4.2 System Quality

System quality indicates performance of the IS in terms of reliability, convenience, ease of use, functionality, and other system metrics (DeLone & McLean, 1992; Petter & McLean, 2009). For instance, if users can rapidly and easily find the type of information they are looking for, they will ultimately be satisfied with the SCW. If the operational performance of a website falls short of expectations, a user will be disappointed and then dissatisfied. However, if a SCWs performance exceeds or meets users' expectations they will be satisfied or even delighted. Thus, we hypothesize as follows:

H3*—There is a positive relationship between system quality of SCWs and traveller's satisfaction with them.*

4.3 Satisfaction

Customer satisfaction is defined as the customers' evaluations of previous relationships, transactions or experiences with a company, a product or a service with regards to their needs and expectations (Oliver, 1980). Satisfaction is the major determinant of channel preference in the context of e-commerce (Devaraj, Fan, & Kohli, 2002), of continued IS use (Bhattacherjee, 2001), of loyalty (Lin, 2008), and stickiness to online virtual communities (Elliot, Lee, & Choi, 2013). However, few studies have measured the relationship between satisfaction and purchase intention in the context of SCWs.

H3*—There is a positive relationship between customer satisfaction with SCW and purchase intention.*

5 Methodology

5.1 Data Collection

The data collection was carried at Hong Kong (HK) International Airport by asking travellers in the waiting areas who have had recent experiences using Tripadvisor when booking accommodation for a holiday to complete an online questionnaire using an iPad provided by the researchers. An online questionnaire using survey monkey was used for this study (Fig. 1). The items were measured using a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). The questionnaire was available both in English and in Cantonese. The backward translation method was used. Prior to data collection the questionnaire was tested with 48 master students.

5.2 Measures

The items and scales used in this study have been shown to have high reliability in previous studies. To measure purchase intentions we used the widely utilized scale developed by Dodds, Monroe, and Grewal (1991). System quality was measured by items used in previous studies (Zheng et al., 2013). The scale used to measure information quality has been developed and tested in previous studies (Park et al., 2007).

The socio-demographic characteristics of the sample are presented in Table 1.

Table 1 Sample details

Age	Frequency	Percent	*Gender*	Frequency	Percent
18–25	60	50	Male	63	54
26–35	50	42	Female	53	45
36–45	5	4	Missing	3	2
46–55	1	1			
Missing	3	2			
Education	Frequency	Percent	*Salary*	Frequency	Percent
Elementary school	1	1	100,000	26	60
High school	33	28	100,000–299,000	12	28
Undergraduate	18	15	300,000–499,000	4	9
Postgraduate	60	52	500,000–999,000	1	2
PhD	4	3	Missing	76	36
Missing	3	1			

6 Analysis and Findings

Convergent Validity was assessed through average variance extracted (AVE), Composite Reliability (CR), and Cronbach's alpha. All of the constructs' AVE values were above the recommended level of 0.5 and CR values were comprised between 0.897 and 0.927 thus well above the threshold of 0.6 (Bagozzi & Yi, 1988) (Table 2). Scale reliability was also assessed for each construct with Cronbach's α (Nunnally, 1978), which ranged from 0.890 and 0.924.

Table 2 Items, CR, AVE, Cronbach alpha

Construct	Items	α	CR — AVE	Factor loadings*
Information quality	1. Current	898	0.907	0.822
	2. Relevant		0.661	0.761
	3. Factual			0.827
	4. Detailed			0.809
	5. Credible			0.845
System quality	1. This website has well organized hyperlinks	0.924	0.927	0.743
	2. I find this website easy to use		0.619	0.883
	3. This website has customizable search functions			0.764
	4. This website provided a message board/forum			0.878
	5. This website provided opportunities to interact with other customers			0.644
	6. This website is easily accessible			0.902
	7. This website provided confidentiality for customer information			0.876
	8. Overall the services provided by this website were of excellent quality			0.519
Customer satisfaction	1. I am satisfied with this website	0.890	0.932	0.906
	2. I am satisfied with my previous experiences with this website		0.820	0.893
	3. I am satisfied with the information/recommendations I have received from this website			0.918
Purchase intentions	1. If I was going to purchase a service, I would consider buying the service from this website	0.911	0.897	0.747
	2. If I was shopping for service, the likelihood I would purchase the service on this website is high		0.687	0.847
	3. My willingness to buy a service from this website would be high if I was shopping for such a service			0.838
	4. The probability I would consider buying the service is high			0.877

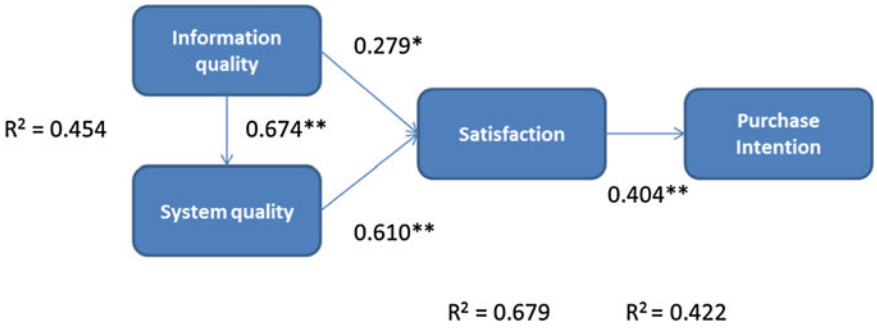

Fig. 2 Results of structural equation model

We tested our hypotheses using structural equation modelling (SEM) with the AMOS 22.0 statistical program, and the results are presented in Fig. 2. The χ^2/df = 1.881, which is below the recommended threshold of 3 (Kline, 2011) and all fix indexes were above the threshold of 0.9 (Hu & Bentler, 1999): CFI = 0.927, TLI = 0.914, and IFI = 0.929.

Figure 2 shows that information quality predicts customer satisfaction ($\beta = 0.279$, $p < 0.001$) as well as system quality ($\beta = 0.674$, $p < 0.005$), thus supporting hypotheses H1 and H2. System quality significantly influences customer satisfaction ($\beta = 0.610$, $p < 0.001$), thus supporting H3. Finally, satisfaction predicts purchase intention ($\beta = 0.404$, $p < 0.001$), supporting H4.

7 Discussion and Conclusions

In the travel and tourism industry, consumers are increasingly adopting SCWs to learn more about products and services they are interested in purchasing. As travellers trust anonymous reviewers more than other sources of information (Dickinger, 2011), SCWs are increasingly enabling customers to interact and share opinion in the form of online consumer reviews. This innovation is modifying the way third-party e-commerce websites carry out their business.

This research attempted to fill a gap in the literature by adapting DeLone and McLean's (1992) Information System Success Model to explore what influences customers' decision to shop on SCWs. Although the ISSM been widely accepted in IS research and the model has been used in e-commerce, knowledge management system, decision support system, and other research domains, this is the first time it has been applied in e-WOM/SCW literature. Our results show that the ISSM provides a strong theoretical framework for understanding the factors that contribute to customer satisfaction and purchase intention in a SCW. We build upon the ISSM by focusing on purchase intention to measure the personal influence of SCW rather than information system success.

Findings show that information quality strongly affects system quality and customer satisfaction. This result underlines the strategic importance of the quality of information in SCWs. It suggests that the quality of SCWs depend on the quality of information that travellers retrieve in online consumer reviews. If these information are accurate, detailed and timely consumers will develop a positive attitude towards the website and will be satisfied. Thus, SCW should continue keep high quality standards of the consumer reviews that they publish.

We also found that system quality affects customer satisfaction and this result is in line to earlier studies of different types of IS (e.g. data warehouse) (Rai et al., 2002; Nelson et al., 2005; Wixom & Todd, 2005; Wu & Wang, 2006).

Finally, we have provided evidence of the relationship between satisfaction and purchase intention. We can conclude by saying that travellers who are satisfied with SCW in terms of their ease of use, navigability, accessibility, confidentiality and of the quality information that they can retrieve in consumer reviews, will purchase the accommodation or restaurant that is recommended on that specific website. This result is particularly interesting for TripAdvisor: if this website wants to succeed in the e-commerce sector, they should make sure that the website is up to the standards of other e-commerce platforms and offer reliable and helpful consumer reviews.

TripAdvisor has started as an independent online community where travellers for the first time could express their travel experience in a destination and on a wide range of tourism services such as hotel, restaurants, tours, car rental and the like. The community 'look and feel' has benefited TripAdvisor, which has developed the image of the reliable website where travellers can find honest and unbiased information of accommodation, restaurants and destination. This has guaranteed its growth in the last years and the website has become a real must among young and adult travellers who rely on the advice and recommendation contained on this website to travel their travels. However, the website has now adopted a social commerce business model selling directly travel and tourism services to their users. The new commercial nature of the website may affect the perception of some travellers about the trustworthiness of the website. However, in order to compete with websites like Booking, Expedia, Hotels.com, TripAdvisor has to take into account the quality standards of e-commerce website and the quality of information that they provide.

By improving the quality of the website and ensuring some standards of quality of the reviews that they publish, this website can make customers satisfied and compete against the big player in the tourism e-commerce industry. Developing website that delivers high quality content, that provides users with valuable tips on products and services, is easy to browse, has well organized hyperlinks, customized search functions, interaction space, will help drive customer satisfaction. Information quality is also important as consumers seek accurate, detailed, current, relevant information. Therefore, it is important for SCWs to monitor reviews and comments as they are posted and ensure that reviews and reviewers provide high quality reviews that satisfy SCW user's needs. Some SCWs are now developing systems where reviewers can be ranked according to the quality of the reviews that post which can help building trust. Additionally, some websites enable its users to

display reviews based on the number of helpful votes received. TripAdvisor may adopt the same system to facilitate travellers find the reviews with the highest quality.

Future research could adopt the model to predict consumer's willingness to purchase from a social commerce website and an e-commerce website, distinguishing between third-party retailers and independent organizations. Additionally, research has established that consumers trust consumer reviews more than content from official destination websites, travel agents, and mass media (Dickinger, 2011). However, little attention has been paid to trust towards consumer-generated media (Yoo & Gretzel, 2009). Future research could consider adding the dimension of trust. For instance, recent research on consumer review websites has found that trust fosters word of mouth and recommendation adoption (Filieri et al., 2015). Future research could measure whether trust determines willingness to buy from a social commerce instead than from an e-commerce platform (e.g. the hotel's website platform).

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Part VIII
e-Reputation Management and Online Reviews

Management Responses on Third-Party Review Websites: A Focus on Emotions and Service Recovery

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Abstract Tourists use dominantly social media spaces to review their experiences, and in particular, voice complaints. Managers have to embrace tourists' enthusiasm for technology and provide accommodative responses. However, research only started recently to investigate management responses based on their communicative skills and acts of service recovery in online spheres. This study analyses 443 reviews and management responses in the third-party review platform TripAdvisor. Through content analysis, six basic emotions and the acts of service recovery were analysed. The study shows that management responses include a high percentage of positive emotions. However, during acts of service recovery, the study demonstrates the use of negative emotions by service providers. The study shows there is room for improvement when addressing failures in online spheres. Managers are warrant to design appropriate responses in order to prevent double deviation effects and a negative online image.

Keywords Service recovery · Third-party review websites · Emotions · Quantitative content analysis

1 Introduction

The customer review pages and social media provide various ways for customers to air their thoughts about service experiences and about service failures (Sparks & Browning, 2010). Websites, such as TripAdvisor and booking.com are examples of such platforms. Tourists can easily spread negative word-of-mouth through online reviews and show the level of (dis)satisfaction by the use of rating scales. Previous

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studies show how online reviews can influence firms' sales, online image, and consumers' buying process (Ye, Law, & Gu, 2009; Xie, Zhang, & Zhang, 2014). To maintain their competitiveness it is essential for firms to perform an in-depth assessment of effective online dialogues (Tripp & Grégoire, 2011; Van Laer & De Ruyter, 2010; Van Noort & Willemsen, 2012). Customers nowadays expect that companies show interest in their problems, are responsive, offer service recovery or redress (Goodwin & Ross, 1992; Tripp & Grégoire, 2011). Black and Kelley (2009) argue that service providers can embrace customer enthusiasm for technology by responding quickly and effectively to online complaints and reviews. Via effective online recovery strategies, service providers can appraise unsatisfied customers and stimulate positive behavioural intentions (Kuo & Wu, 2012). According to Dickinger and Bauernfeind (2009) companies should take their communication efforts seriously particularly in an act of service recovery. Inducing positive emotions and mitigating negative emotions would allow service provides to enhance customers' satisfaction and post-purchase intentions (Ashforth & Humphrey, 1993; Giardini & Frese, 2008; Kuo & Wu, 2012). However, currently, service recovery actions are primarily focused on functional service recovery instead of emotionally satisfying the customer (Tsarenko & Strizhakova, 2013). Yet, service providers should keep in mind that complaint handling and service recovery is not only about repaying redress but about managing the whole process (Donoghue & de Klerk, 2013; Edvardsson, Tronvoll, & Höykinpuro, 2011; Gabbott, Tsarenko, & Mok, 2011). Research started to investigate online reviews and management responses affecting tourists' satisfaction (Bonfanti, Vigolo, & Negri, 2016; De Ascaniis, Borrè, Marchiori, & Cantoni, 2015; Dens, De Pelsmacker, & Purnawirawan, 2015; Lui, Schuckert, & Law, 2015; Min, Lim, & Magnini, 2014). However, there is still more to explore in the framework of online service recovery in tourism, in particular employees' emotional coping strategies after a problem or stressful event addressed by reviewers. Therefore, this study aims to investigate management responses to online reviews, by analysing their emotions as well as recovery strategies used. In doing so, the paper supports firms to develop appropriate interactions and service recovery strategies in social media spheres.

2 Literature Review

2.1 The Importance of the Service Encounter and Service Recovery

Service encounters are goal-oriented interactions between service providers and service receivers (Salomonson, Åberg, & Allwood, 2012). Customers form attitudes and behavioural intentions based on their service encounters. Therefore, customers pay attention if the service provider (i) delivers a high quality product/service, (ii) manages a skilful service delivery process, and (iii) provides a

fair service. Service employees act as boundary spanners responsible for delivering services and organization-customer interfaces (Liao, 2007). Thus, employees' trustworthy behaviour, empathy, care and competence supports image formation (Harrison & Beatty, 2011; Van Dolen, De Ruyter, & Lemmink, 2004; Van Noort & Willemsen, 2012). In the event of service failure, service providers need to show effort to recover the service (Black & Kelley, 2009). Effective service recovery results in customer satisfaction, trust, positive attitudes and emotions (Turel & Connelly, 2013). Kuo and Wu (2012) argue that perceived justice is identified as a key cognitive influence in the formation of customer satisfaction and post-purchase intentions. Customers may be satisfied with the negative experience if they perceive that they were treated fairly (Santos & Boote, 2003). Justice theory, proposing three dimensions (distributive, interactional, and procedural justice) leading to satisfactory service recovery (Cohen-Charash & Spector, 2001; Orsingher, Valentini, & de Angelis, 2010). Orsingher et al. (2010) suggest that distributive justice has the strongest effect on satisfaction with complaint handling. Customers want a fair redress and reliability of service quality. Interactional justice has the second largest impact on satisfaction with complaint handling. The employees' empathy, politeness, and willingness to provide reasonable explanations contribute to positive evaluations of interactional justice (Orsingher et al., 2010; Menon & Dubé, 2007). Procedural justice has the weakest effect on satisfaction (Orsingher et al., 2010). In case service providers do not provide a satisfying act of service recovery, double and triple deviation effects occur (Edvardsson et al., 2011). This means that consumers calculate an extra of their input and if the firm fails to increase customers' gains, this results in a magnifying effect of the consumers' negative evaluation. Thus, service providers are warrant to effectively solve service failures. The next paragraph will explain this in more detail.

2.2 Emotions in Service Interactions

Service literature highlights the importance of employees expressing socially desirable emotions during service encounters and acts of service recovery (Ashforth & Humphrey, 1993). Affective processes are central for service encounters and their evaluation (Giardini & Frese, 2008; Harrison & Beatty, 2011; Menon & Dubé, 2007). According to Van Laer, De Ruyter, and Cox (2013) emphatic employees are socially sensitive and want to restore the integrity perceptions of customers. Moreover, their study shows that employees with an empathy bias are more often engaged in customer stories, and feel greater moral obligation to respond to blog posts, engage in online conversations about the company and take responsibility (Van Laer et al., 2013). Tsarenko and Strizhakova (2013) state that service personnel's expression of positive emotions facilitate a corresponding emotional state of customers, which leads to greater levels of satisfaction. Richards and Hackett (2012) argue that the ability of service providers to regulate emotions is beneficial in fostering strong relationships with customers. Positive emotions, such as joy,

happiness, excitement and pleasure have a positive influence on customer satisfaction (Colquitt, 2001; Han & Jeong, 2013). Negative emotions such as fear, boredom, angriness, annoyance, frustration, disappointment and irritation have a negative effect on customer satisfaction (Han & Jeong, 2013). The ability of a service provider to accurately, and effectively perceive, express, understand and regulate emotions is a determinant of customer satisfaction (Barlow & Maul, 2001; Menon & Dubé, 2007). Thus, literature highlights the importance of service providers' role of listening, caring, showing empathy and regulating customers' emotions.

Employees' responses and their effect on customer satisfaction are also analysed in the online world. Previous studies show how proper handling of online reviews can affect firms' sales, online image and consumers' online buying process (Ye et al., 2009; Liu et al., 2015). Thus, from a competition perspective it is essential for firms to consider an in-depth assessment of effective responses in online spheres (Van Laer & De Ruyter, 2010; Echeverri & Skålén, 2011; Tripp & Grégoire, 2011; Park & Allen, 2013; Sharpe, Huang, & Ravichandran, 2016). Van Noort and Willemsen (2012) state that an accommodative response evokes positive cognitive responses, and has a favourable effect on how consumers evaluate the company. A recent study by Min et al. (2014) demonstrates that responses should be empathic and reflecting firms' engagement with online complaints in order to enhance customer satisfaction. For example, they state that paraphrasing complaints in a response to a negative review will influence tourists' attitudes more positively (Min et al., 2014). Dens et al. (2015) investigated appropriate responses to negative online reviews. Their study shows that readers of reviews prefer no response instead of receiving only an apology or a refutation of the review. Interestingly, the speed of the response shows not to influence the level of satisfaction with the response (Min et al., 2014). However, there is only limited research analysing acts of service recovery in combination with emotions expressed; thus, this paper aims to identify emotions used in management responses as part of online service recovery.

3 Method

3.1 Sample

Data was collected from the third-party review website TripAdvisor. TripAdvisor is an online review site with more than 50 million monthly visitors (Kim & Gupta, 2012). In order to capture a broad range of hotels, first, reviews of hotels based in the most visited cities in the world were included (Bremner, 2010). Second, reviews were selected from different hotel classifications. In order to achieve an equal distribution of reviews from every hotel, at least one review of each review category ('1'–'5') was selected. However, only reviews that included a management response were included, resulting in a total of 443 reviews and 443 management

responses. The final data collected contained the hotel review, the management response to the review, the overall rating the reviewer provides, the star rating of the hotel and overall ratings collected on TripAdvisor.

3.2 Computer-Assisted Analysis for Emotional Regulations

First, the hotel reviews and management responses are analysed based upon their emotions. This study employs computer-assisted content analysis to analyse the online reviews and responses. Computer-assisted content analysis supports researchers in analysing large quantities of data. When applying computer-assisted content analysis, the dictionary-based approach measuring the word count of the topic of interest is commonly used (Pollach, 2011). Considering synonyms, anonyms and hierarchies helps to indicate the importance of a topic in text (Pollach, 2011). Wordstat was used for the analyses of the project at hand. The program allows analysing texts in several formats, reduces words in canonical form, and supports univariate frequency analysis and bivariate comparison between any textual field and any nominal and ordinal variable (e.g., age of respondents). Furthermore, WordStat counts the frequencies of term lists generated by the researcher in the form a dictionary in the text corpus (Pollach, 2011). Various research in consumer behaviour has been devoted to measure and capture consumer emotions. According to Han et al. (2010) researchers who examine emotional aspects of consumer behaviour, can take either a categorical dimension approach, which uses several independent mono-polar categories of emotional responses, or researchers can take the structural dimension approach that assumes that emotional states are related to one another in a systematic manner. Laros and Steenkamp (2005) propose to introduce a hierarchy of consumer emotions since emotions can be considered at different levels of abstraction. Moreover, symmetries between negative and positive emotions can be found (Ellsworth & Smith, 1988; Fredrickson, 1998). According to Fredrickson (1998) positive emotions, compared to negative ones, are fewer in number and less differentiated. Thus, the distinction between positive and negative emotions can be problematic. Based on the preceding discussion, this study applies a dictionary approach based on six basic categories of emotions identified by previous research and the according terms representing the categories (Izard, 1992; Lazarus, 1991): *joy, fear, sadness, disgust, anger and surprise.* A dictionary covering those emotions was designed, drawing on previous research by linguists and psychologists as mentioned above. Table 1 provides an overview of the main dimensions and selected key words based upon Lazarus (1991) categorization and synonyms. For anger, words such as annoyance, hate, irritate and unkind were taken into account. According to Lazarus (1991) this category can be defined as a reaction to degrading offense which can well be a result of perceived injustice in a service setting. According to Lazarus (1991) the category sadness refers to someone's experience of irrevocable loss. Words such as depress,

Table 1 Dictionary of emotions (based on Lazarus, 1991)

Anger	Sadness	Joy	Fear	Disgust	Surprise
Annoyance	Depress	Cheerful	Anguish	Awful	Admire
Arrogance	Disappoint	Comfortable	Anxiety	Desperate	Amazing
Complain	Dissatisfy	Delightful	Despair	Dislike	Attractive
Furious	Comfortless	Enjoy	Distress	Fury	Excellent
Irritate	Hopeless	Fun	Fear	Horrendous	Extraordinary
Mad	Miserable	Glad	Hesitate	Poor	Fantastic
Protest	Regret	Happy	Restless	Outraged	Gracious
Severity	Somber	Pleasant	Timidity	Shocking	Magnificence
Wound	Unpleased	Satisfied	Unease	Terrible	Splendid

disappoint, dissatisfy, grief, miserable and regret are within this category. Regarding joy, Lazarus (1991) argues that this refers to a reasonable progress towards the realization of a goal; words such as cheerful, comfortable, enjoy, pleased and fond of are included. Emotions in terms of fear are covered by words such as anxiety, distress, distrust, restless and to-worry. Fear can be felt when someone is facing an immediate and concrete danger while disgust is felt when observing in or being too close to a disgusting object or idea (Lazarus, 1991). In this study, surprise is categorized as a positive valence emotion, where one feels amazement or wonder.

3.3 Quantitative Content Analysis for Service Recovery

Quantitative analysis was also performed regarding the response of management i.e., the service recovery. Content analysis has the overall aim to code the text into various categories (Stepchenkova, Kirilenko, & Morrison, 2009). Justice theory, as introduced in the literature review, guided the identification of relevant variables to assess a service recovery procedure (Dickinger & Bauernfeind, 2009). Two independent coders analysed the management responses. All variables were measured by binary variables (0 = attribute not present, 1 = attribute present). Procedural justice is covered by (i) the reviewer is encouraged to send further message, (ii) an explanation is given, (iii) customer is assured that customer feedback is taken seriously, (iv) effort made to solve the problem and, (v) responsibility taken to solve a problem. Distributive justice includes the following variables: (i) compensation for failure is offered, (ii) fair outcome, (iii) solution offered to failure. Interactional justice is covered by the following variables: (i) completeness of the reply, (ii) appropriate greeting and (iii) closing, (iv) an apology is given, and (v) the managers' response is helpful.

4 Results

4.1 Emotions in Reviews Opposed from Management Responses

Table 2 indicates which type of emotion is used in travellers' reviews as opposed to managers' responses. The Chi-square-tests show significant differences between review and response regarding all emotion types. The results indicate that managers use a high proportion (73.3%) of positive terms (joy and surprise). Travellers use terms related to surprise to the largest extent. Anger and disgust are also significantly more represented in travellers' reviews than in management responses. However, managers seem to use terminology related to sadness hinting at the use of this type of language in response to negative reviews.

Further analyses were performed including TripAdvisor's rating scale (1–5). Rating scales are an indicator of consumers' satisfaction with the service experience, hinting at the need for accommodative responses from the service provider (Dens et al., 2015). As Table 3 indicates, there is a significant difference between service providers' responses according to the reviews rating score. All emotions, except for fear, show significant differences. Management responses across all ratings contain positively valence emotions (surprise). Service providers show their concerns and apologies in expressing words of sadness in response to low rated reviews. Though, negative emotions are noticed, where service providers use words related to anger, fear and disgust in a response to low rated experiences.

Table 2 Emotions in reviews and responses

Emotions	Review (%)	Response (%)	*p*-value
Surprise	46.1	14.4	0.000
Joy	34.7	73.3	0.000
Anger	7.9	2.3	0.000
Disgust	6.3	1.3	0.000
Sadness	4.2	6.8	0.000
Fear	0.8	1.9	0.000

Table 3 Percentages of emotions per TripAdvisor category and per emotion—management responses

	TripAdvisor scale (%)					
	1	2	3	4	5	*p*-value
Emotions						
Surprise	24.6	24.0	21.7	23.6	27.5	0.023
Joy	46.3	45.2	58.1	66.7	67.8	0.000
Anger	6.8	7.6	4.6	2.6	1.3	0.000
Disgust	3.1	6.8	2.8	0.3	1.0	0.000
Sadness	14.7	12.2	7.8	3.7	1.1	0.000
Fear	4.5	4.2	5.1	3.1	1.4	0.135

Furthermore, Chi-Square analyses were performed to indicate the differences between the hotel star classification and management responses concerning the emotions used. Xie et al. (2014) state that high-class hotels emphasize the training of their employees in delivering outstanding service quality in online and offline settings. Hence, expected responses of high-class hotels (i.e., 1 and 5 star hotels) contain appropriate emotions and/or mimicking responses. Interestingly, the results show that emotions of anger, joy and surprise are significantly different depending on hotel categories ($p < 0.005$). Anger shows to be significantly more present (6.9%) among responses of 5 star hotels, whereas anger is only contained in 2.6% of responses of 1 star hotels. Surprise is significantly more frequently used in responses of 1 and 2 star hotels (60%) compared to 48.8% of 5 star hotels. The use of joy in management responses is significantly ascending in percentage from 1 to 5 star hotels ($p < 0.005$). Given those mixed results, the assumptions that higher class hotels' management respond in an emotionally appropriate manner to online reviews is not supported.

4.2 Analysis of Service Recovery Strategy

To analyse the service recovery strategy of the hotel managers' responses, only reviews that address a problem or issue that occurred during the experience are included. Hence, the analysis include 265 reviews addressing a service failure, which counts for 60% for the collected reviews. Chi-square tests show a significant difference ($p < 0.001$) between rating scales and failures reported in reviews, granting insight into the (in) consistency of review and rating scale. For example, 6% of reviews addressing a service failure still rated their stay with an "excellent" score (5). This is in line with Jiang, Gretzel, and Law (2010) stating that review rating might not be the most accurate identification of tourist experiences. In addition, hotel star classification (1–5 star) and the content in the review are compare (Park & Allen, 2013). Interestingly, 4 star hotels receive the highest number of reviews reporting failures (36%), 5 star hotels receive 24.7% of negative reports, whereas 1 star hotels only exhibit a small percentage of reviews reporting service failures (1.1%).

Finally, the presence of the dimensions of justice theory in the message of hotel management responses is analysed (Table 4 provides an overview). Distributive justice, measured by three items is well covered apart from "compensation offered" with only 6.8%. The items representing interactional justice exhibit the highest frequencies. This is followed by procedural justice, which is also present in more than half of the responses. Chi-square tests of hotel star classifications and the presence of the justice dimensions yield interesting results (see Table 4 right column). Three items in the dimension interactional justice show significant differences depending on the hotel classification. Lastly, one item of the procedural justice dimensions shows that 5 star hotels exhibit a higher proficiency in the interaction with customers in the event of service failure. Please find examples in the appendix.

Table 4 Justice dimensions in management responses and differences between hotel star classifications

	Presence of justice dimensions in responses (%)	Difference depending on hotel classification (*p*-value)
Procedural justice		
Explanation given	47.9	0.655
Encouragement given for further contact	63.0	0.317
Acknowledged customer feedback is important	52.8	0.011
Effort made to resolve problem	64.1	0.217
Responsibility taken	56.6	0.665
Distributive justice		
Compensation offered	6.8	0.785
Fair outcome	51.7	0.374
Solution offered	40.3	0.516
Interactional justice		
Completeness response	54.3	0.197
Shows concern	75.5	0.007
Apology given	65.0	0.006
Helpful answer	80.4	0.006

4.3 Emotions Used in Service Recovery

The following section provides insights into the presence of emotional terms connected to the justice dimensions. Table 5 shows the emotional regulated responses in comparison to the acts of service recovery.

Procedural justice shows to be mostly positively connotated (joy and surprise), but also feelings of sadness are represented and surprisingly feelings of anger. This hints at lower levels of emotional regulated responses. Among the distributive justice dimensions, also high levels of positively laden responses are found, dominated by joy. However, also in this category negative emotions are found, especially connected to compensations offered to the customers (12.3%). Similarly, the interactional justice dimension exhibits positive emotional responses, where joy and surprise are significantly used. High levels of emotional competence are hinted at by including feelings of sadness when apologizing for the service failure (12.8%). As Colquitt (2001) states, consumers expect respectful and honest treatment interaction led by integrity and sensitivity to others. Additionally, interactional justice strongly refers to the use of appropriate language and communication style. However, emotions of anger and disgust are present in management responses indicating room for improvement of the service recovery dialogue.

Table 5 Emotions and their appearance in online service recovery

Justice dimensions	Emotions (%)					
	Surprise	Joy	Anger	Disgust	Sadness	Fear
Procedural justice						
Explanation given	23.4	52.0	6.9	3.9	9.7	4.1
Encouragement given for further contact	23.5	58.7	3.6	2.6	7.5	4.2
Acknowledged customer feedback is important	25.7	58.1	3.4*	2.6*	6.3*	3.9
Effort made to resolve problem	24.1	54.7	4.9	3.1	8.6	4.5
Responsibility taken	22.4*	52.5	4.6	4.4	11.3	47.9
Distributive justice						
Compensation offered	24.6	42.1	12.3	3.5	15.8	1.8
Fair outcome	24.9*	60.8	3.8	2.2*	5.5	2.9
Solution offered	22.2*	54.2	6.6	3.2	9.5	4.3
Interactional justice						
Completeness response	26.5	58.2	4.2*	2.5*	5.8*	2.8*
Shows concern	25.1	60.0	3.2*	2.2*	6.3*	6.0*
An apology given	23.2	50.4	4.9	4.0	12.8	4.7
Helpful answer	25.0	59.2	3.9*	2.4*	6.1*	3.4*

*Not significant ($p > 0.05$)

5 Conclusion and Recommendations

The hospitality industry needs to find strategies for online service recovery as more consumers use social media to voice their opinions. The non-verbal communication in online service interactions challenges managers to respond in an accommodative manner to consumers' complaints (Park et al., 2013; Min et al., 2014; Dens et al., 2015; Sharpe et al., 2016). Thus, employees need to learn how to generate appropriate service recovery responses, so that customers feel taken seriously (Tsarenko & Strizhakova, 2013). Supportive communicative skills can create feelings of trust and satisfaction, leading to long-term relationship building (Salomonson et al., 2012). In general, employees should realize that engagement and caring for customers can lead to increased levels of customer satisfaction as well as a positive online image (Kim & Gupta, 2012; Ye et al., 2009). This study investigated emotions used in online reviews and management responses. First, the study illustrates that travellers regulate their emotions rather well, especially looking into negative reviews, where a high percentages of joy and surprise are found. As Kim and Gupta (2012) state, milder emotions may signal reviewer self-control and enhances rationality and information value. Customers hereby shows that they try to shape their desired experiential outcomes of service failure (Mok et al., 2008). Second, this study illustrates service providers' ability to

(i) regulate their own emotions (relatively high level of positive related emotions) and (ii) enforce acts of service recovery. Furthermore, the study demonstrates that high-class hotels significantly put more effort into appropriate communication to solve service failures. In general, the responses hint at the use of all justice dimensions. Though, the distributive justice dimension is least represented in the responses. A possible explanation is that service providers contact the complainers and offer solutions in private spheres. Service providers express positive and empathic feelings when they offer a service recovery.

However, the study also indicated the presence of emotions such as anger, disgust and fear in management responses, which illustrates the lack of service providers' ability to regulate his/her own emotion. Even more problematic is the usage of negative emotions during acts of service recovery. This can lead, on the one hand, to double deviation effects (Edvardsson et al., 2011), and on the other hand, to negative online image (Ye et al., 2009; Liu et al., 2015). Firms are, thus, highly advised to develop more appropriate responses including the justice dimensions and emotional regulation strategies. Practitioners could consider the development of scripts and inter-related customer relationship management strategies to design appropriate management responses in social media spaces. In addition, firms' have to make this an integrated part of their web reputation management (Bonfanti et al., 2016). Firms should continue to train employees to understand what aspects of the outcomes, the procedures and the interpersonal communications can improve effective dialogues in social media spaces. As this study primarily focused on the management responses, further studies should continue analysing the role of the respondents. Additionally, innovative data mining techniques could enhance the identification of emotions, overcoming the limitation of the dictionary-approach used in this study.

Appendix

Examples of management responses:
Procedural justice—"1" rated review, '4 star hotel': "*Dear xxxx, Thank you for selecting xxxx during your recent stay in xxxx We take all reviews seriously and appreciate your feedback highlighting our forte and the areas for improvement. Regrettably, you have left the hotel dissatisfied with the feeling that you have not been served up to the standards you would expect of the xxxx We sincerely hope that you will consider a return visit to the hotel and to give us the opportunity to meet your expectations at xxxx*".
Distributive justice—"2" rated review, '5 star hotel': "*I am very distressed to read this review. We take pride in the fact that our storage system is very secure and very responsible. If you would like you can send an email to guestservices@xxxx.com with a list of items and I will personally look into this situation myself*".

Interactional justice—'2' rated review, '3 star hotel': "*Dear xxxx, thank you for taking the time, to write such a comprehensive review, I truly appreciate it, and have discussed your comments with the team, you can be assured that we will be improving our concierge service. Once again thank you for your review and we look forward to welcoming you back to xxxx very shortly, regards xxxx*".

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Online Reputation and Tourism Destination Competitiveness—Conceptual Model Development and Pilot Testing

Jelena Dorcic and Jelena Komsic

Abstract Travellers use social media in all phases of travel planning. Previous research confirmed that people trust online reviews more than other sources of information. Building good online reputation is necessary for tourist destinations in order to be competitive. The purpose of this study is to provide a conceptual model for measuring the relationship between online reputation and tourism destination competitiveness and to present the results of the pilot study. The main objective of this study is to validate the studied constructs, the related questions and used scales. Descriptive statistics and reliability analysis were performed on a sample of 130 respondents. The total Cronbach's alpha was 0.915 indicating a very high degree of internal consistency. The paper contributes to the existing literature by providing theoretical evidence of the relationship between online reputation and tourism destination competitiveness and testing existing measurement scales on small tourism destination.

Keywords Online reputation · Tourism destination competitiveness · Social media · Reliability analysis

1 Introduction

Social media have become an important information source for travellers. Travellers use social networks, travel reviews, blogs and all other user-generated contents (UGC) provided online to help them in making their own decisions about

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the destinations they will visit, accommodation they will book, and all other activities and services they will buy during the holiday. Today 31% of all world population are active social media users (2016 Digital Yearbook). The number of active Facebook users has now reached an estimated 1.5 billion people around the world (ITB World Travel Trends Report, 2015/2016) while other social platforms are continuing to grow. Generally speaking, consumers are using Facebook at a higher rate than other social networks (eMarketer, 2015a). Furthermore, recently eMarketer (2015b) found that for Internet users in North America online reviews (76%) are the second most trusted source of information when making purchase decisions, right after friend and family opinions (81%). According to the Eurobarometer (2015) survey Europeans still consider recommendations of friends, colleagues or relatives (55%) the most important when making decisions regarding their travel plans, while online sources represent 54% (46% Internet websites and 8% social media).

Social media influence travellers during all stages of the travel planning process: before, during and after the holiday (Fotis, Buhalis, & Rossides, 2012). Internet-based evaluation is becoming an important tool for tourists in making travel decisions. According to the Google Travel Study (2014), 65% of travellers who travel for leisure purposes turn to the web early on in the travel process, and 61% of leisure travellers choose a destination after viewing travel videos. Therefore research of the impact of social media on traveller behaviour has increased over recent years. Today, all tourism destinations compete in attracting visitors and enhancing their experience. Since tourism trends indicate that in the future social media users will grow and online travel bookings will increase, it is necessary for tourism destinations to continually improve their online image and reputation. Reputation is an essential component of destination competitiveness (Minghetti & Celotto, 2015). Good online reputation represents a sustainable competitive advantage for tourist destinations.

Recently Komsic and Dorcic (2016) provided an extended literature review and identified that there is a large research gap in measuring the impact of online reputation on destination competitiveness. Thus, this study goes one step further by developing a conceptual model for measuring the relationship between online reputation and tourism destination competitiveness. To identify and exclude potential problems that might occur in the main research, a pilot study was conducted and the results will be presented in this paper.

This paper is structured as follows. Section 2 provides an overview of related existing literature on the topic of online reputation and tourism destination competitiveness. Section 3 presents the instrument development, the data collection and the analysis. Research results are presented in Sect. 4 while Sect. 5 describes conclusions, limitations, and future directions.

2 Theoretical Background

Reputation is a very complex construct that has been applied to many fields and can be viewed from psychological, sociological, economic, organization, marketing and corporate communication perspectives (Marchiori & Cantoni, 2011). Reputation can be viewed as a long term positive or negative opinion held by a group of people about an object (person, firm, organization etc.) or characteristics of an object. User Generated Content (UGC) could be viewed as the online version of traditional word-of-mouth (Wyrwol, 2014). Researchers have applied many theories to explain how people are influenced by received information in an online context. Dual-process theory is one of the most used theoretical foundations in electronic word-of-mouth (eWOM) studies (Cheung & Thadani, 2012). According to this theory there are two types of influence on the persuasiveness of received messages: informational influence and normative influence (Deutsch & Gerrard, 1955). The informational influence factor is related to the message receiver's judgment about the content, source and receiver. On the other hand, the normative influence category refers to norms/expectations of others in the group or community.

Cheung et al. (2009) applied the dual-process theory to investigate how users of an online-consumer discussion forum evaluate the credibility of online recommendations. They found that informational influence factors as well as normative factors significantly influenced perceived eWOM review credibility. On the basis of the study by Cheung et al. (2009), Marchiori et al. (2013) incorporated three information based determinants (online message components) in their conceptual model to investigate how online conversations impact the online reputation of a destination. These three online message components are: argument strengths, message sidedness, and message consistency. Argument strength is the "extent to which the message receiver views the argument as convincing or valid in supporting its position" (Cheung et al., 2009: 15). Message sidedness is related to the presence of both positive and negative elements. Messages can be divided in two categories; a one-sided message that presents either positive or negative points, or a two-sided message that contains both elements. Message consistency represents "whether the current eWOM recommendation is consistent with other contributors' experiences concerning the same product or service evaluation" (Cheung et al., 2009: 18).

In marketing literature, trust has been recognized as an important influencer of the consumer's online behaviour. Travellers have used the Internet as an information channel for years and have more recently also started to produce content themselves (Dickinger, 2011). Several studies indicated that eWOM is becoming increasingly popular because it is considered highly credible and informative as customers can make inferences about the trustworthiness of a website and the information it provides (Dickinger, 2011). The results of previous studies also indicated that consumers generally trust in information provided on social media (Del Chiappa, 2011; Yoo & Gretzel, 2011). Therefore, travellers believe that online reviews could help them make their purchase decision.

The topic of decision making is a cornerstone in marketing and consumer behaviour (Kozak, 2010). Yoo and Chon (2008) stated that in tourism literature, a considerable number of researchers studied individual tourists' travel decisions, especially focusing on destination choice processes (e.g. Crompton, 1992; Decrop & Snelders, 2005; Seddighi & Theocharous, 2002; Sirakaya, Sonmez, & Choi, 2001; Sirakaya & Woodside, 2005; Um & Crompton, 1990; Woodside & Lysonski, 1989). In the decision-making process, information is one of the key elements. Normally, consumers do not have access to all information and one part of the decision process is on them to decide whether or not the information is accurate and relevant. Signalling theory (Spence, 1973) is very useful in explaining how consumers use online information as a signal of quality in the decision process. Recently, Marchiori et al. (2013) found that consumers are familiar with the concept of reputation and are showing aptitude to identify the leading opinion of web users regarding a destination. Despite the number of authors highlighting the importance of the relationship between online reputation and tourism destination competitiveness, this relationship has not yet been tested.

The concept of tourism destination competitiveness has been studied from various perspectives. The literature demonstrates that the concept of competitiveness is very complex and there seems to be no generally accepted definition. Tourism destination competitiveness is linked to the ability of a destination to create and integrate value-added products (Hassan, 2000), to increase tourism destination expenditure, continually attract visitors and provide them with satisfying, memorable experiences (Ritchie & Crouch, 2003) and, most importantly, to do all this better than other destinations (Dwyer & Kim, 2003). Many models have been developed to explain and measure destination competitiveness. The integrated model for measuring destination competitiveness by Dwyer and Kim (2003) is the most well-known model. Their indicators were categorized into five subgroups: endowed resources, supporting factors, destination management, situational conditions, and demand factors. Tourism demand is a special form of demand that is determined by many factors, such as socio-economic and demographic factors, quality factors and price factors (Dwyer et al., 2001). According to Dwyer et al. (2014) demand conditions comprise three main elements of tourism demand—awareness, perception and preferences. In their study one of the limitations was that the demand factors were insufficiently tested. They pointed out that many studies of destination competitiveness neglected the viewpoint of the tourist and that researchers struggle to find appropriate indicators to measure perceptions, values and attitudes of tourist demand. One of the problems is that destination competitiveness is usually viewed from destination perspectives while destination attractiveness is viewed from the tourist perspective (Vengesayi, 2003). The literature shows that there is theoretical evidence that online reputation created by UGC could influence the tourists' decision-making, tourism demand and, ultimately, tourism destination competitiveness.

3 Research Methodology

3.1 Research Objective and Research Questions

In order to analyse the relationship between online reputation and tourism destination competitiveness, a conceptual model is proposed and a pilot study conducted. The main objective for conducting this pilot study was to validate the studied constructs, the related questions and used scale. This study intended to answer two research questions: *Is there a theoretical relationship between online reputation and tourism destination competitiveness? Are the existing measurement scales valid and applicable on small tourism destinations?*

3.2 Instrument Development

The questionnaire was adopted from relevant previous research. The questionnaire consists of 42 variables grouped into 5 constructs plus the socio-demographic profile.

Table 1 shows the constructs, references and items used in the questionnaire. According to Marchiori et al. (2013), online message components are critical drivers in the mental elaboration of online conversations. Trust attitude towards social media will affect the attitude of being an online reputation seeker, suggesting that people search for the online expressed dominant opinion because they generally rely on online conversations. Online reviews and subjective experiences of travellers who have visited a tourist destination substantially affect visits to a destination. The travel decision-making process is underpinned by the determinant of demand, while demand conditions represent an essential component of destination competitiveness.

The questionnaire was divided into 7 sections: Sect. 1 informed the participants about the aim of the research and provided guidelines and motivation for participation in the research. This section of the questionnaire included a scenario where participants were asked to remember the last online, information search about the destination. Sections 2 to 6 were related to the constructs of the proposed

Table 1 Constructs, references and items

Construct	References	Items
Online message components	Marchiori et al. (2013)	10
Attitude of being an online reputation seeker	Marchiori et al. (2013)	6
Trust attitude towards social media	Marchiori et al. (2013)	6
Decision making	Um and Crompton (1992), Briggs et al. (2002)	10
Demand conditions	Crouch and Ritchie (1999), Dwyer and Kim (2001)	10

conceptual model. Section 2 asked for information about online message components. Section 3 posed questions about the attitude towards online conversations. Section 4 included questions about the opinions regarding traveller provided comments and materials on social media. Section 5 referred to factors that influence decision making. Section 6 was related to the tourism demand, and Sect. 7 asked for socio-demographic information such as gender, age, education/qualifications, travel purpose, frequency of travelling in the course of a year, knowledge and familiarity with the Internet, the most frequently used online travel sources and similar. The questionnaire was prepared and proofread in English, German, Croatian, Italian and French. All of the items were measured with a five-point Likert-type scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). It should be emphasized that the construct tourism destination competitiveness was validated by the authors in another parallel research in 2016 at the same destination. The construct was measured with so called "soft data", in this case with tourist satisfaction, because tourist satisfaction undoubtedly represents an important source and key indicator of tourism destination competitiveness (Israeli, Barkan, & Fleishman, 2006; Žabkar et al., 2010; Miličević et al., 2016). The scale was adopted from an institutional tourism survey in Croatia seaside destination, known as TOMAS Summer *2014—Attitudes and Expenditures of Tourists in Croatia* (Institute for Tourism) and included 23 variables.

3.3 Data Collection

The target population of the pilot study were tourists who previously, in social media, searched for information about the Opatija Riviera (Croatia). In total, 130 usable questionnaires were collected which represents 21% of the sample that is going to be obtained for the main research. Since Structural Equation Modelling (SEM) will be applied in the main research, the population was defined by Jackson (2003) as the N:*q* rule. An acceptable sample size-to-parameter ratio would be 15:1, which means that the minimum sample size should be 15×42, or N = 630. The data were collected from March 20 to May 20, 2016. Google Forms were used to create and collect the online questionnaires via social media.

3.4 Data Analysis

Descriptive statistics and reliability analyses were the most suitable to be applied in this study. Frequencies and percentages were used to report proportions of the gathered information, while reliability analysis was performed to check to which extent a variable or set of variables is consistent in what it is intended to measure. For this reason Cronbach's alpha was applied. The generally agreed upon lower level for Cronbach's alpha is 0.70, although it may decrease to 0.60 in exploratory

research (Hair et al., 2010: 125). The Statistical Package for Social Science (IBM SPSS 20) was used to analyse the collected data.

3.5 Instrument Validity

Content validity was performed to assess the degree of correspondence between the items selected to constitute a summated scale and its conceptual definition. For this reason, five associate and full professors with interest in teaching methodology and five doctoral students were asked to critically assess the questionnaire to avoid any unclear or redundant questions. All criticism was carefully analysed and taken into consideration.

4 Research Results

Background information about the demographics of the respondents as well as their travel and information source characteristics is presented in Table 2.

The study results have shown that the respondents' gender ratio was 65.4% female to 34.6% male. The respondents came from 24 countries with a distribution of 25.4% belonging to domestic and 74.6% to foreign tourists. The most significant age group was the one between 21 and 30 years of age (60.0%), while the least significant age group was the one between 41 and 61 and older (14.8%). Not surprisingly, a high number of younger respondents had university education (61.5%) and is very familiar with using the Internet (advanced Internet users are 42.3% and experts 39.2%). Those respondents travel 2 to 3 times a year (43.8%) and use traveller comments as information sources on a regular basis. Among those information sources, consumer reviews are the most popular (43.1%), followed by media sharing (21.5%), social networks (16.2%), wikis (9.2%), blogs (8.5%) and other (1.5%).

In order to evaluate the extent to which each measurement item was internally consistent, Table 3 presents the results of descriptive and reliability statistics for the constructs in the questionnaire.

The reliability analysis was conducted with SPSS in order to calculate Cronbach's alpha. These results showed a total Cronbach's alpha of 0.915 indicating a very high degree of internal consistency. When observing the Cronbach's alpha values separately, it can be noted that four constructs had values greater than 0.8. The only exception is the construct decision making with a Cronbach's alpha of 0.67, which is only marginally acceptable.

Descriptive statistical analysis was used to describe and summarize the features of the data in the study. Analysing the first construct "online message components", it can be noted that the mean scores range from 3.26 to 3.88. Observing each variable, respondents agreed with 45% that the comments are convincing, strong

Table 2 Socio-demographic characteristics (n = 130)

Characteristics	%	Characteristics	%
Gender		Age	
Female	65.4	*Less than 20*	6.2
Male	34.6	*21–25*	36.2
Tourists		*26–30*	23.8
Domestic	25.4	*31–40*	19.2
Foreign	74.6	*41–50*	2.3
Travel purpose		*51–60*	8.6
Business	12.3	61 and above	3.9
Pleasure	87.7	Education qualification	
Travel frequency in the course of a year		*Primary school*	0.8
Not once	4.6	*Secondary school*	16.2
Once a year	32.3	*Higher education*	21.5
2–3 times a year	43.8	*University*	61.5
3–4 times a year	19.2	Tourists' comments as an information source	
Most used online travel sources		*Yes, on a regular basis*	63.8
Consumer review	43.1	*Yes, occasionally*	22.3
Wiki	9.2	*I don't know*	6.9
Blogs	8.5	*No*	6.9
Social Networks	16.2	Familiarity with the Internet	
Media Sharing	21.5	*Novice*	0.8
Other	1.5	*Intermediate user*	17.7
		Advanced user	42.3
		Expert	39.2

and good. The lowest mean score was achieved by the variable "opinions posted in the comments are similar to each other" (3.26), where 45% neither agreed nor disagreed and 52% agreed with the statement.

The second construct "attitude of being an online reputation seeker" was measured with six variables which achieved mean scores between 3.57 and 3.93. The results have also shown that 72% of the respondents tried to understand the reputation of the destination presented online (3.92). Moreover, 67% of the respondents tried to understand if the people had travel experiences similar to one they would like to have (3.93).

Interesting results have been found concerning "trust attitude towards social media". In general, 50% of the respondents trust comments/materials posted by other travellers, and trust reviews, ratings, and comments by other travellers more than evaluations provided in formal and official travel articles, guidebooks, etc. It has also been noted that only 5% of the respondents strongly disagree with the trustworthiness of the opinions and 3% doubt in the reliability of travel information sources.

Table 3 Descriptive and reliability statistics for constructs in the research model (n = 130)

Constructs/Variables	Mean	Standard deviation	Cronbach's alpha
Online message components	*3.60*		*0.838*
The comments are convincing	3.67	0.820	
The comments are strong	3.57	0.931	
The comments are good	3.85	0.811	
The comments stress positive implications about the destination	3.88	0.903	
The comments stress favourable opinions of the destination	3.82	0.870	
The comments include both pros and cons of the destination	3.72	1.183	
Opinions posted in the comments are consistent with each other	3.45	1.028	
Opinions posted in the comments are similar to each other	3.26	0.945	
Authors of the comments had similar opinions about the destination	3.41	0.895	
Authors of the comments had similar experiences in the destination	3.41	1.069	
Attitude of being an online reputation seeker	*3.81*		*0.847*
I try to understand the reputation of the destination presented online	3.92	1.125	
I try to understand which aspects of the destination have a bad reputation online	3.76	1.173	
I try to understand if the people online have a similar opinion about the destination	3.79	1.047	
I try to understand if the people had travel experiences similar to the one I would like to have	3.93	1.182	
I try to recognize the main opinion posted in the social media	3.68	1.234	
I try to recognize the content which differs from the main opinion posted in the social media	3.57	1.306	
Trust towards social media	*3.44*		*0.847*
In general, I trust comments/materials posted by other travellers	3.50	0.909	
I feel confident that the comments/materials provided by other travellers are posted with the best intentions in mind	3.39	0.928	
The comments/materials are posted by other travellers are a reliable source of travel information	3.42	0.987	
I trust reviews, ratings, and comments by other travellers more than evaluations provided in formal and official travel articles, guidebooks etc.	3.58	1.048	
The opinions are trustworthy	3.28	0.854	

(continued)

Table 3 (continued)

Constructs/Variables	Mean	Standard deviation	Cronbach's alpha
The opinions are plentiful	3.47	0.925	
Decision making	*3.59*		*0.677*
Social media reviews helped me make the right destination decision	3.60	1.068	
Others have recommended that I select the destination as a place to go	3.46	1.079	
I will travel to the destination because a friend or family member wants to go there	2.89	1.150	
Others in the travel group with whom I usually travel agree with my selection of the destination	3.92	0.920	
I want to travel to the destination because that is where everyone goes	2.35	1.205	
The attractive natural environment is one of the major reasons for selecting the destination	3.88	1.076	
Climate is a major factor in my decision to visit the destination	3.79	1.105	
I can do a wide variety of things in the destination	3.94	0.971	
A trip to the destination is likely to enhance my feeling of well-being	4.01	0.952	
The destination is likely to be a good place for me to relax	4.10	0.947	
Demand condition	*3.67*		*0.808*
The destination is internationally recognized	3.48	1.163	
The destination leaves a positive impression online	3.82	0.887	
The destination is appealing	4.20	0.791	
The destination has a good image	4.12	0.817	
The destination organizes special events	3.28	1.004	
The destination offers a high quality of service	3.58	0.963	
The destination has good promotional activities	3.26	0.945	
The destination provides a sense of security	3.98	0.840	
The costs of stay in the destination are low	3.27	1.105	
The destination is easily accessible	3.72	1.013	
Total	*3.62*	–	*0.915*

Decision making is the fourth construct in the conceptual model and includes ten variables with mean scores ranging from 2.35 to 4.10. The results have shown that today's travellers (58%) do not want to travel to the destination because that is where everyone goes. They also do not want to travel to the destination because a friend or family member wants to go there (37%). On the other hand, the results have also shown that 54% of the respondents are influenced by others.

The last construct presents the "demand conditions" which consist of ten variables. The construct achieved a mean score of 3.67, while the variables had mean

scores ranging from 3.26 to 4.20. A high percentage of the respondents (84%) agreed that the destination has a good image and is appealing. Also, 75% of the respondents agreed that the destination provides a sense of security, while 5% did not agree. Concerning the costs of stay and good promotional activities, 44% of the respondents did not agree with an appealing performance.

Concerning the results, the online reputation of the destination is positive. As was previously mentioned, many studies confirmed that travellers use social media in all phases of travel planning and that people trust online reviews more than other sources of information. Because of that, all stakeholders in the destination should work hard towards improving the destination reputation in general and with special emphasis on its online reputation.

5 Conclusion

The existing literature gap mainly refers to empirical research. The theory indicated that (online) reputation plays a crucial role in increasing tourist demand and tourism destination competitiveness which results in improving the quality of life and socio-economic prosperity.

A pilot study was conducted in order to develop and test the adequacy of the research instrument. Furthermore, one of the advantages of carrying out a pilot study was to uncover and become alerted of any weaknesses in the proposed study. Conducting such a pilot study does not guarantee success in the main study, but it does increase the likelihood of success.

The paper contributes to the existing literature by providing theoretical evidence of relationship between online reputation and tourism destination competitiveness and testing existing measurement scales on small tourism destination.

There are some limitations to this study: (a) the sample size is small and not adequate; (b) the distribution of responses across gender and age is not equal; (c) Cronbach's alpha value is low and only marginally acceptable for the construct decision making (0.67); and (d) the findings apply only to a specific and small geographical context and therefore cannot be generalized. Nevertheless, these limitations do not diminish the validity and the relevance of the reported findings. They serve as a foundation for further research in this area.

The findings of this study suggest that all limitations should be taken into consideration to improve the results of the main study. Future research should enrich the analysis by applying a more complex statistical analysis; it should take place in Croatian regions Istria and Kvarner which represent a benchmark of Croatian tourism; it should determine the reason for the weak Cronbach's alpha for the construct "decision making", modified and needs to be further investigated; and compare the results with previous results.

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"Thank You for Your Stay," and Then What? Macau Hotels' Responses to Consumer Online Reviews

Shanshan Qi and Ning (Chris) Chen

Abstract User generated content (UCG), particularly in the form of online reviews, has significantly influenced consumer purchasing behaviour, not least as regards hotel selection. In order to maintain a positive image on social media, hoteliers are seeking effective strategies for responding to online reviews. This study uses Macau as a locus for investigating reviews posted on the TripAdvisor website. The findings suggest that negative reviews differ widely in accordance with hotel star level. It was also found that Macau hotels reply not only to negative reviews, but act also on positive comments.

Keywords User generated content · Hotel · Macau · Negative review · Hotel response

1 Introduction

Hotel promotions, bookings, transactions, and reviews abound on multifarious online platforms, such as hotels' official websites, travel intermediaries' coordinated platforms, national tourism board websites and online social media (O'Connor, 2010; Sun, Fong, Law, & Luk, 2015). Compared with traditional feedback channels, online social media presents a new means of promoting hotel products (Sun et al., 2015). Electronic word-of-mouth (eWOM)—which refers to online reviews,

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online recommendations and opinions with the emergence of new technological tools—becomes increasingly influential in business-to-consumer (B2C) and consumer-to-consumer (C2C) communication (Cantallops & Salvi, 2014). Comments in online social media represent the voluntary, unmediated opinions of hotel guests, past and present (Volo, 2010). Consumers value this type of information due to its unique user-generated content (UGC) (Gretzel, 2006; Pan, MacLaurin, & Crotts, 2007), content that significantly influences tourists' pre-trip planning and post-trip reflections (Leung, Law & Buhalis, 2013).

Online reviews provide an expeditious means for prospective hotel guests to compare tourism and hospitality products and services, from sources near and far (Sparks, So, & Bradley, 2016). Hotel selection is significantly affected by online reviews; three-quarters of travellers have considered online reviews as an information source when planning their trips, and more than half are averse to booking a hotel that has zero reviews (Gretzel & Yoo, 2008). Positive reviews stimulate consumer purchases, especially their hotel bookings (Ye, Law, & Gu, 2009), whereas negative reviews cause lasting damage to hotel reputations, damage that hoteliers endeavour to prevent or, failing this, to mitigate, in each case by way of prompt action (Sparks et al., 2016). Service failure must be remedied if customer loyalty is to be maintained (Bonfanti, Vigolo, & Negri, 2016).

Existing literature emphasizes investigation of, and effective approaches to online reviews (Cantallops & Salvi, 2014), but the characteristics of negative reviews in the context of hotel star levels have been largely neglected. This paper aims to fill this research gap by considering the Macau hotel industry's responses to negative reviews aired on TripAdvisor.

Macau is one of the two Special Administrative Regions (SAR) of China, and is a popular tourism destination, referred to as the "Las Vegas of the East". In 2015 Macau attracted 30.1 million visitors, and average hotel occupancy reached 76% (Macau Statistics and Census Service Department, 2016). Macau has over 20,000 hotel rooms in 86 hotels, including 8 five-star deluxe hotels, 25 five-star hotels, 14 four-star hotels, 12 three-star hotels, 4 three-star guest houses, 11 two-star hotels, and 12 two-star guest houses (Macau Government Tourism Organization, 2015). Due to the increase in tourist arrivals, the competition is fierce. Understanding and duly responding to consumers' preferences as these are expressed in reviews will yield a key competitive advantage for Macau hotel managers.

2 Literature Review

The influence of online reviews on hotel development has been widely investigated, helping hoteliers with their strategic planning, marketing and product development. For instance, hotels can gain a competitive advantage by analysing, and by developing their services in response to, the C2C perceptions—the "buzz marketing"—of eWOM (Ye et al., 2009). Accommodation providers differ in their assessments as to the impact of eWOM, and so they must develop standardized

measurements and analytical criteria with which to assess the online comments of hotel guests (Crotts, Mason, & Davis, 2009; Hills & Cairncross, 2010). Jeong and Jeon (2008) found that perceived "value" is one of the key predictors for hotel guest satisfaction and hotel star ratings. Li, Law, Vu, Rong, and Zhao (2015) adopted pattern mining techniques to identify hotel preferences via collected online reviews from TripAdvisor.com. Online reviews of Manhattan hotels confirm the importance of hotel location (Xiang & Krawczyk, 2016).

Online reviews allow hotel guests from around the world to exchange experiences, and provide an opportunity for hoteliers to communicate with guests (Litvin, Goldsmith, & Pan, 2008). Although consumers will search for information from various online channels before booking, they consider user generated content the most trustworthy source (Papathanassis & Knolle, 2011; Dickinger, 2011). Consumers are likely influenced by negative reviews, given that lodging reputation is more significant when it results from consumer evaluations (Spark & Browning, 2011; Loureiro & Kastenholz, 2011). Maxham (2001) found that a firm's recovery efforts can either salvage customer relationships or compound the failure. After analysed hotel customers' comments, Kim, Kim, and Heo (2016) found that "staff and their attitude" is a key to fulfil customer satisfaction and resolve dissatisfaction in both full-service and limited-service hotels. Although previous literature has paid great attention to service recovery strategies, how hotels respond directly to consumers' reviews has been overlooked.

This paper uses social media comments on Macau hotels (low to high star range) as a case study in order to investigate consumers' negative comments and hoteliers' responses to these comments. The research focus can be further divided into three sub-objectives: 1. Generalize the characteristics of consumers' negative online reviews; 2. Learn how comments vary with hotel star level; and 3. perform a content analysis of, and summarize, hoteliers' responses to negative consumer reviews.

3 Methodology

TripAdvisor is well-recognized as an international online information exchange platform where tourists from all over the world exchange comments under the travel and tourism theme (Filieri & McLeay, 2014). The target online reviews are under the hotel category, and ratings lower than 3 out of 5 were included in this study's data analysis. In total 1,180 negative reviews and 389 responses from hoteliers, comprising postings dating from late 2008 to 10 December 2014, were collected.

The process of data collection and analysis is shown in Fig. 1. First, the collected data was coded in seven variables: reviewer's gender, age, country of origin; hotel star level, ratings, reviews, and hotel responses. Then a random sample was selected from the pool, and the qualitative data of the reviews in this sample was further coded into twelve 0/1 variables to capture the main themes in the reviews: room, staff, service quality, time, breakfast/food, location, transport, Wi-Fi/internet, value for money, pool/gym/spa, casino, experience. Following this, the data was analysed in two steps: (1) review data was analysed in a content analysis to

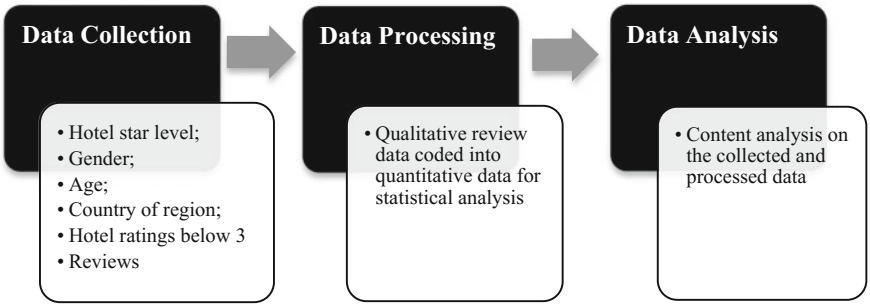

Fig. 1 The process of data collection and analysis

summarise top ranked themes and cross-compared with sampled coded quantitative data analysis on Chi-square test; (2) hotel response data was analysed in terms of hotels' star level, and different response mechanisms are summarised and discussed.

In the content analysis, the textual data was "cleaned" to remove the words that are grammatically useful but do not contribute to the meanings of the sentences. Nvivo 10 was chosen for mining the textual data. In Nvivo the word frequency query test was adopted. Upon scanning the review content, only word lengths of over 3 letters mentioned more than 1000 times were selected.

4 Findings

4.1 Understanding Negative Review Themes

Out of the 1,180 negative reviews, 158 are of two-star hotels or guest houses, 177 are of three-star hotels, 230 are of four-star hotels, 558 are of five-star hotels, and 57 are of five-star deluxe hotels. As a result of the word frequency query test, the top ten themes in the negative reviews under each star level are summarised in Table 1.

Table 1 Top ten themes in negative reviews

Rank	2 stars	3 stars	4 stars	5 stars	5 star deluxe
1	Room	Room	Room	Room	Room
2	Bed	Staff	Staff	Staff	Staff
3	Location	Bed	Service	Service	Casino
4	Floor	Service	Time	Time	Time
5	Staff	Bus	Bed	Breakfast	Floor
6	Time	Time	Breakfast	Pool	Service
7	Price	Breakfast	Casino	Casino	Experience
8	Clean	Shuttle	Location	Floor	Breakfast
9	Breakfast	Floor	Price	Experience	Shower
10	Door	Location	Shuttle	Lobby	Bathroom

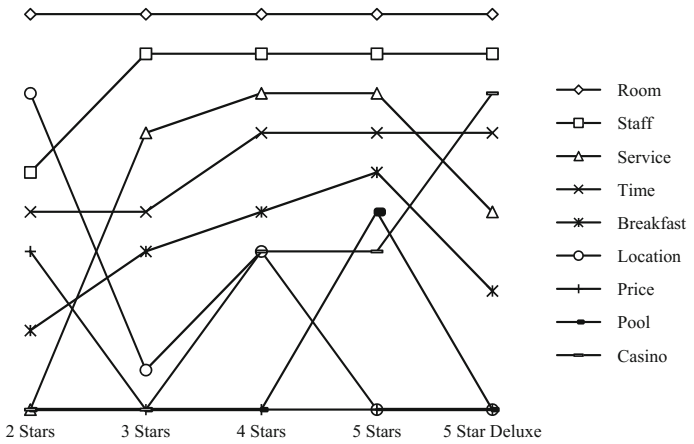

Fig. 2 Theme ranks at different star levels

Main themes including room, staff, service, time, breakfast, location, price, pool, and casino are further compared in terms of their ranks across different hotel star levels in Fig. 2.

Room was found to be the most reviewed theme in negative reviews across all star levels, as is to be expected since room quality is the core component of a hotel product. Staff quality (staff capability, language skills, attitude, etc.) is a key aspect for 3-star hotels to 5-star deluxe hotels, but not so important for 2-star hotels. The importance of casino increases in proportion to hotel star level. Service quality remains a major issue for 3-, 4-, and 5-star hotels, while guests of higher star level hotels are more concerned with response time than are guests of lower star level hotels. Specifically, some 4- and 5-star hotels are of immense size and the service capacities of their reception desks are not sufficient to cope with large check-in/check-out flows. Interestingly, 2-star hotel guests mention in their negative reviews location and price more, while 5-star hotel guests have greater concern for the swimming pool. In the reviews, consumers of middle-range hotels take breakfast as a key aspect in their hotel experience, but breakfast is seen as less important in 2-star hotels and 5-star deluxe hotels.

The word frequency query test is not able to imply any statistical significance. To cross-validate the findings, this study took a coding procedure, and each consumer review was coded in terms of whether the key themes summarised early are covered. For instance, if the reviewer discussed staff in the review, the value is coded as 1 (in contrast to 0) for the created variable of staff. Twelve 0/1 variables were added to the data set and a random sample was selected for the statistical analysis. The sample size is 476. Demographics are illustrated in Table 2. Respondents are from 33 countries and regions and the majority are from Asia.

Table 2 Demographic statistics

Demographics	Frequency	Percentage (%)
Gender		
Male	292	61.3
Female	184	38.7
Age		
13–17	1	0.2
18–24	17	3.6
25–34	199	41.8
35–49	184	38.7
50–64	75	15.8

Table 3 Theme frequency

Themes	2 star (%)	3 star (%)	4 star (%)	5 star (%)	5 star deluxe (%)
Room	86.4	87.2	82.2	77.0	85.2
Staff	49.2	69.2	66.7	55.9	70.4
Service quality	20.3	39.7	38.9	49.5	48.1
Time	10.2	14.1	16.7	34.7	11.1
Breakfast/Food	20.3	26.9	46.7	31.5	33.3
Location	66.1	52.6	51.1	26.6	11.1
Transport	13.6	28.2	33.3	26.1	25.9
Wifi/Internet	18.6	21.8	18.9	14.9	3.7
Value for money	61.0	42.3	44.4	30.2	48.1
Pool/Gym/Spa	0.0	5.1	12.2	21.2	11.1
Casino	0.0	3.8	12.2	19.4	33.3
Experience	8.5	6.4	13.3	10.8	18.5

The percentage of each theme mentioned for each star level hotel is summarised in Table 3.

Chi-square tests using IBM SPSS Statistics 23 were performed to examine the associations between different star levels of hotels and the proposed themes. The results are illustrated in Table 4. Chi-square tests indicate significant associations between hotels' star levels and staff, service quality, time, breakfast/food, location, value for money, pool/gym/spa, and casino. The results from Chi-square tests and from theme frequency analysis are highly consistent with those from the thematic and content analysis above.

The only variation between qualitative thematic and content analysis, and quantitative frequency and Chi-square test, lie in the themes of time and breakfast in 5-star deluxe hotel reviews. In the thematic analysis, concerns in service time distribute similarly between 5-star hotel reviews and 5-star deluxe hotel reviews. However, in the frequency analysis, 11.1% of reviews on 5-star deluxe hotels expressed concerns as to service time, compared to 34.7% for 5-star hotels.

Table 4 Chi-square test results

Themes	*df*	χ^2	*p.*	*phi*
Room	4	5.784	0.216	0.110
Staff	4	10.133	0.038	0.146**
Service quality	4	17.462	0.002	0.192***
Time	4	29.728	0.000	0.250***
Breakfast/Food	4	13.447	0.009	0.168**
Location	4	52.742	0.000	0.333***
Transport	4	7.396	0.116	0.125
Wifi/Internet	4	5.766	0.217	0.110
Value for money	4	21.475	0.000	0.212***
Pool/Gym/Spa	4	25.082	0.000	0.230***
Casino	4	30.456	0.000	0.253***
Experience	4	4.186	0.381	0.094

Significance < 0.05** or < 0.01***

Breakfast and service are ranked lower in 5-star deluxe hotel reviews in the content analysis compared to 5-star (not deluxe) hotel reviews, but in the frequency distribution, a high similarity exists between 5-star hotels and 5-star deluxe hotels as regards concerns over breakfast (31.5% in 5-star hotel reviews versus 33.3% in 5-star deluxe hotel reviews) and service (49.5% in 5-star hotel reviews versus 48.1% in 5-star deluxe hotel reviews).

In summary, *room* quality remains the top aspect in consumer evaluations of hotel products, and: (1) 2-star hotel guests have fewer concerns (or implicitly lower expectations) as to *staff* quality (staff capability, language skills, attitude, etc.) but are more concerned with *value for money* (*price*); (2) lower star ranked hotel guests have fewer concerns (or implicitly lower expectations) as to *service* quality but pay more attention to hotel *location* and facilities such as pool, gym and spa services; (3) 5-star hotel guests have significant concerns as to service *time*; (4) 4-star hotel guests have significant concerns as to *breakfast* or *food*; (5) the importance of *casino* increases as hotel star level rises; (6) there were no statistically significant differences across different star ranked hotels on *transportation* to and from hotel, *internet* service, or general consumer *experience*.

4.2 Summarising Hotel Response Mechanism

Table 5 summarises hotel responses to consumer reviews. Content analysis of the 389 hotelier responses shows that most of these responses were posted by hotel operation departments. It is interesting that hotels did not respond only to negative reviews; a large portion of the responses were related to positive comments as well. Therefore, based on the content nature, the responses were further sorted into three columns: responses to negative reviews; responses to positive reviews; and responses to recommendations.

Table 5 Hotel response mechanism

	Responds to negative review	Responds to positive review	Responds to recommendations
Hotel star rating			
2-star (N = 19)	19	None	None
3-star (N = 1)	1	None	None
4-star (N = 4)	1	3	None
5 Star &5 Star Deluxe (N = 365)	102	231	32
Respond strategy	(counts)	(counts)	(counts)
Apology	Apologies (72); service (75); pool (43); experience/experiences (72); room/rooms (62); facility/facilities (22); accept (41)	None	None
Correction	Hope (57); provide (20)	None	Distant (14)
Empathy	Shortfalls (33); understand (15)	Proud (24); glad (36); flawless (27)	Experience/experiences (30)
Compensation	Future (45); assistance (11)	None	None
Follow-up	Following (68); future (45); improve/improvement (45); working (31)	Operations (164); future (33); director (163); assistances (139)	Following (31); improve/improvement (27); future (22);
Acknowledgement	Thanks (137); post (72); review (78); feedback (32); comments (73)	Thanks (302); kind (166); feedback (91); comments (83); enjoyed (63); support (34); appreciated (32)	Thanks (64); stay (52); comments (32); review (39); post (35); note (14); share (16)
Explanation	On behalf (38); Peak (14)	Team (192); room (32); personalized (31); shopping (22); family (21); provide (32)	Service (40); management (39); pool (33); team (34); facility (20); room (17)
Exceptional treatment	None	None	None
Managerial intervention	None	None	None

The findings suggest that 3- and 4-star hotels in Macau have less online communication with their guests compared with 2-star, 5-star, and 5-star deluxe hotels. The hotels often used "stock" responses; for example, one hotel used this same reply for six consumers: "Thank you for your stay, the hotel is currently still improving in all aspects, I believe that your next stay will be more different—Andy." There is one response from a 3-star hotel to a negative comment. This hotel

offered a very detailed explanation, claiming that their CCTV record did not substantiate the guest's complaint and requested further communication with the guest. Four responses were found in the 4-star hotel category, three of which addressed positive responses. The response to the negative complaint consisted of an apology and commitment to better service in future.

Meanwhile, 5-star and 5-star deluxe hotels were very active in communicating with their online reviewers: 365 responses were found. Unlike the responses from other star level hotels, however, these replies were more often addressed to positive reviews than to negative reviews and recommendations. The implication is that these high star-level hotels strive to reinforce customer loyalty. The responses varied as to content but were similar in style. Hotels often appreciated consumers' compliments in detail, and declared their ongoing commitment to high quality personalized services. More importantly, most of the hotels offered rewards to employees frequently cited for exceptional service, and, to facilitate these customer citations, left e-mail addresses for further contacts. There are 102 responses to consumers' negative reviews, responses that strove to restore the hotels' service status. The majority of these comments focused on apologies and explanations for the service failure and left contacts for further communication. Five-star and 5-star deluxe hotels also managed to respond to consumers' recommendations, the content of the responses differing in accordance with the recommendation.

In order to further analyse the response content, the most frequent 1000 terms have been categorized into nine response types based on Lewis and McCann's (2004) study: apology; correction; empathy; compensation; follow-up; acknowledgement; explanation; exceptional treatment; managerial intervention. The apologies were associated with the top themes in negative reviews: service; pool; experience/experiences; room/rooms and facility/facilities. Hotels acknowledged their shortcomings and, to further mitigate the damage, vowed to do better. When responding to positive reviews, hoteliers acknowledged the comments and elaborated on their continued efforts to provide the best possible service. In so doing they stimulated the channels of positive feedback while reinforcing customer loyalty.

5 Conclusion

Prompt and effective response strategies to consumer online reviews are crucial if hotels wish to remedy service failure and enhance customer loyalty. This study analysed the content of negative consumer reviews of Macau hotels and found ten key themes: room; staff; service quality; time; breakfast/food; location; transport; Wi-Fi/internet; value for money; pool/gym/spa; casino; experience. Hotel responses to negative reviews were matched with the content of consumer complaints. Consumers' expectations of service, as illustrated by their top complaint themes, varied with hotel star level. The findings suggest that guests of lower star-rated hotels have fewer concerns (or implicitly lower expectations) as to service quality but pay more attention to hotel location and to facilities such as pool, gym and spa.

The importance of casino, breakfast/food, and service time increases with hotel star level. Therefore, Macau 2-, 3- and 4-star hotels should focus on facilities development and taxi or shuttle services. Furthermore, providing detailed and "custom-tailored" responses to different online reviews rather than stock replies embodies an ideal of individualized service and helps rejuvenate hotel reputations. The previous literature has emphasized the importance of hotel service recovery in the face of negative reviews. The image boost of positive eWOM can be undercut by the image bust due to hoteliers' ineffective responses to negative reviews (Sparks et al., 2016). Five-star and 5-star deluxe hotels replied most often to positive reviews, perhaps because it is easier to build on positive impressions than to mitigate negative impressions. But 5-star and 5-star deluxe hotels may benefit from an equal focus on damage control.

This case study comprises a first attempt to investigate online consumer reviews and hoteliers' responses to these reviews. The research findings contribute to the industry by providing a general picture of Macau hotels' customer service strategies. Further studies may consider matching positive and negative reviews with their respective responses to seek performance solutions for low-rating hotels. An advanced text-mining tool is also recommended for future studies to provide deeper content analysis.

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A Preliminary Analysis of Relationships Between Traveller Characteristics and Hotel Review Ratings

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Abstract This study aims to examine how customer satisfaction varies across different trip types and travellers' experience levels. Using online reviews covering all Hong Kong hotels in TripAdvisor, we performed a series of analyses to understand the relationships between rating and self-identified trip type and experience level represented by the reviewer's badge. This study shows that reviewers self-identified as couples tend to give higher ratings, which could be explained by the so-called happiness effect. Travellers with more travel experience tend to give lower ratings. The findings help us gain insights into the nature of user-generated contents and offer useful implications for hotel managers to understand online consumer behaviour.

Keywords Online review · Rating · Trip type · Experience level · Happiness effects · Satisfaction

1 Introduction

With the enormous growth of digital content on the Internet, online information is generating greater influence on Internet users including travellers. Through giving ratings and posting comments travellers can express their attitude or satisfaction

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with the products or service. It is widely recognized that customer satisfaction is an essential objective due to its importance to marketing strategies and service management in the hospitality industry. Higher level of customer satisfaction can lead to customer loyalty, trust, positive word-of-mouth, and repeating sales, increase in future revenue and stock prices, and a reduction in customer complaints, and perceived risk (Oh & Parks, 1997; Zhang, Zhang, & Law, 2013). Social media especially online consumer reviews offer new opportunities for us to understand factors contributing to hotel guests' satisfaction (e.g., Xiang, Schwartz, Gerdes, & Uysal, 2015).

Travellers' satisfaction may be influenced by many factors that could be classified into two foremost categories, that is consumer characteristics and product/service features. Zhu and Zhang (2010) have proposed a conceptual framework involving product features, consumer characteristics and other factors to show differential impact of consumer reviews across products in the same product category. They suggest that firms' online marketing strategies should be contingent on product attributes and consumer characteristics. Building upon existing literature on guest satisfaction using online hotel reviews, this study explores how customer satisfaction varies across different trip types and travellers' experience levels. We believe this is useful because it allows us to understand the relationships between satisfaction (represented by rating) and reviewer characteristics in the online contexts.

The rest of the paper proceeds as follows. The next section reviews the relevant literature, followed by the description of data and methods. Then, the results are presented and discussed. Finally, conclusions are drawn and directions for future research are discussed.

2 Literature Review

Different customers might perceive and evaluate the same service with different perspectives, regardless of how it is provided. Existing literature has focused on the related key factors influencing customer satisfaction in hospitality research with the methodology ranging from survey analysis to empirical models. Thanks to the tourism website and the widespread availability of information, data on both individual consumers and hotel properties could be obtained and understood. Online review websites such as TripAdvisor provide direct data that we can use for analysing the relationship between traveller characteristics and hotel review ratings. Typically, travellers give a star rating to hotels, destinations or trips generally ranging from one to five on websites such as TripAdvisor. Higher ratings indicate higher satisfaction levels. Zhu and Zhang (2010) show that product and consumer characteristics have moderating effect on the influence of online consumer reviews on product sales, which reflects the impacts of consumer characteristics. In the hotel industry, the features of hotels such as location, value, room, service, cleanliness may influence traveller satisfaction (Li, Ye, & Law, 2013). Moreover, reviewer

characteristics have been shown to be important determinants of customer satisfaction represented by online rating (Banerjee & Chua, 2016; Liang, Schuckert, & Law, 2016).

2.1 Trip Type and Satisfaction

Generally speaking, travellers of different trip types may have different preferences in hotel selection and varying expectation, which may lead to different satisfaction level. With respect to travellers' different purposes and expectations, travellers of different types possess varying sentiment states (Ariffin & Maghzi, 2012a, b). For example, psychological studies have shown that happiness has the potential to influence service evaluations, as people who differ in their degree of happiness have been found to react differently to the same events, with happier people perceiving things more positively (Argyle, 2013; Wessman, 1956). Some studies have compared business and leisure travellers, showing that hotel attributes have a different effect on the selections made by each group (Ye, Li, Wang, & Law, 2014; Liang et al., 2016).

There is growing literature that examine trip type using online reviews and studies have found differences in satisfaction between these two trip types (Liang et al., 2016; Ananth, DeMicco, Moreo, & Howey, 1992; Choi & Chu, 1999; Ye et al., 2014). However, most studies only used two broad categories, i.e., business and leisure. More importantly, these studies only consider trip types as a control variable instead of the main outcome variable. Ye et al. (2014), for example, showed that the impact of price on perceived quality and value will be influenced by the type of trip travellers are taking using online review data.

Regarding travellers' different purposes and expectations the effect of trip type needs to be understood with finer granularities (Ariffin & Maghzi, 2012b). Banerjee and Chua (2016) use five travellers' profiles, namely, business, couple, family, friend and solo on TripAdvisor for the first time to investigate travellers' rating patterns difference between independent and chain hotels. There is no doubt that five self-identified trip type could reveal more information about personal characteristic. Hence, this study first shed light on the satisfaction level difference across five trip types.

2.2 Experience Level and Satisfaction

According to cognitive psychology, another factor relevant to traveller characteristics is reviewers' experience level. TripAdvisor adopts incentive measures to encourage reviewers to express their comments, which motivates users to continue participating in the website and to voluntarily contribute high-quality content (Schuckert et al., 2015; Liu et al., 2015). These incentives signify travellers' trip

experience to some extent. Specifically, a reviewer with higher status in the reviewer hierarchy indicates that he/she has more trip experience and online review experience. Hence, reviewers' level of experience could be considered as an important element of personal characteristic.

Some studies have shown that reviewer experience could influence rating patterns (Liu et al., 2015; Schuckert et al., 2015). Based on assimilation-contrast theory and bounded rationality theory, Liang, Schuckert and Law (2016) suppose that customer online review experience has a positive effect on customer satisfaction. Liu et al. (2015) show that the average quality of the content produced by a reviewer drops as status (experience level) increases. While these studies showed that traveller experience and satisfaction rating are connected, their findings are not conclusive.

3 Data and Descriptive Analysis

In this study, we selected trip types and experience level as primary individual characteristics that could impact satisfaction rating. The data used in this study were crawled from the popular online travel community website Tripadvisor.com (http://www.tripadvisor.com) using a Java program. According with previous studies, it is usually assumed that comments and reviews on Tripadvisor are generally more trustworthy than other websites (e.g., online travel agencies). TripAdvisor provides individual customer reviews, along with customers' trip type and evaluations of their experiences (ratings) of hotels worldwide. We selected all the available hotels in Hong Kong and collected the related data in May 2016. At the time of data collection, 696 hotels in Hong Kong had been registered on tripadvisor.com. However, due to missing values, we excluded hotels without enough reviews and reviews before 2010. Finally, only 410 hotels remained with a total of 99,397 reviews.

Figure 1 shows information related to hotel reviews provided on tripadvisor.com. Reviewers could give an overall and a number of specific ratings, which could be regarded as representation of satisfaction at the whole and specific level. Travel experience is represented by the "badge" of levels (level 3 contributor in this case). Travellers are classified by self-identification into five profiles, namely business, couple, family, friend and solo. Comparing with simple two categories (i.e., business vs. leisure) in the literature, five-type classification may offer more detailed and nuanced information in terms of how these traveller characteristics impact satisfaction rating. Table 1 displays the variables extracted from the website and used for analysis along with their descriptions.

We first conducted descriptive analysis by examining rating patterns related to personal characteristics and hotel service levels. Although TripAdvisor offers "finer" classification for reviewer level (0–6) and hotel star (0–5), we consolidated them into three levels, i.e., H (for high), M (for medium), and L (for low) (see Table 1). As can be seen from the crosstabs statistics (Table 2), most reviewers

Fig. 1 Traveller reviews on Hong Kong hotels on Tripadvisor.com

tended to give fairly high ratings since average values of rating values are all higher than three. With respect to trip type, couple and family groups seemed to give generally higher ratings, while travellers of business trip type gave low-level hotels highest ratings.

To understand how trip type was related to specific aspect of hotel ratings (i.e., location, sleep quality, rooms, service, value, and cleanliness), we plotted the rating difference across both characteristic chains of hotels and trip types. Figure 2 shows that, among the six aspects ratings on rooms and value appeared to be lower than other aspects, and the pattern was consistent across all travel types. More interestingly, ratings given by couple group appeared to be higher than other groups in all aspects of hotel ratings.

Table 1 Variables used for analysis

Variable	Description
TripType	Travelers are self-identified as one of the five types, namely, business, couple, family, friend and solo according to their record on TripAdvisor. For reviewers, only one type could be chosen
PLevel	The reviewer experience levels, based on the badges given by TripAdvisor, represent reviewers' experience levels (5–6: H; 4–5: M; 0–3: L)
HotelLevel	Original five levels based on star rating in TripAdvisor are consolidated into three (4–5: H; 2.5–3.5: M; 0–2: L)
Rating	A self-reported measure of how satisfied the individual is with the hotel he has lived in at the whole level
Location	Ratings about the hotel location provided by travelers
SleepQuality	Ratings about sleep quality at the hotel provided by travelers
Rooms	Ratings about the hotel rooms provided by travelers
Service	Ratings about the hotel service provided by travelers
Value	Ratings about the hotel value felt by travelers
PCleanliness	Ratings about the hotel cleanliness provided by travelers

Table 2 Crosstabs statistics results

Rating	TripType						
	Business		Couple	Family	Friends	Solo	Total
PLevel	H	4.09	4.25	4.18	4.07	4.07	4.16
	M	4.14	4.29	4.18	4.10	4.11	4.19
	L	4.25	4.33	4.17	4.18	4.18	4.24
HotelLevel	H	4.24	4.41	4.27	4.28	4.29	4.31
	M	3.70	3.87	3.78	3.76	3.85	3.80
	L	3.68	3.37	3.46	3.22	3.29	3.40

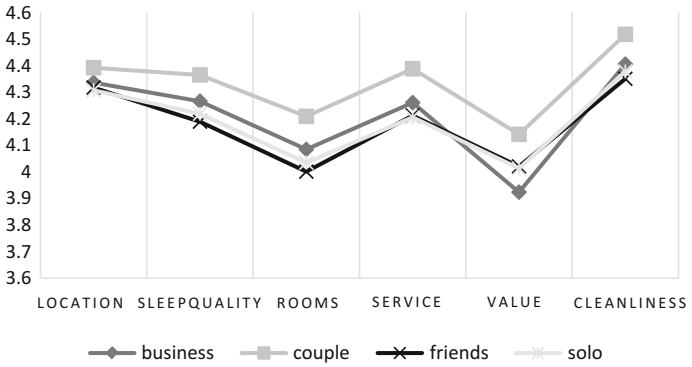

Fig. 2 Specific ratings across trip types

4 Empirical Analysis and Findings

Besides the descriptive analysis to gain a preliminary understanding of the data, we also conducted variance analysis and regression analysis to further explore the relationship between satisfaction and personal or hotel characteristics. First, a one-way analysis of variance (ANOVA) was conducted to check for any variation in customer satisfaction with hotels across trip types. The results of the estimation of this simplified model are displayed in Table 3. As can be seen, the variation across trip groups is statistically significant, indicating that group differences in customer satisfaction do exist.

The next analysis conducted aimed to examine how rating was influenced by trip type and experience by including hotel service level as a control variable. To overcome heteroscedasticity of ordinary regression model (OLS), we used generalized regression model (GLS) which was more robust, as follows.

$$Rating_i = \alpha\, Trip\ Type_i + \beta\, P\ Level_i + \gamma\, Hotel\ level_i + e_i \quad (1)$$

As stated above, TripType includes five categories while PLevel and Hotellevel are consolidated into three levels. We select solo group, middle-level hotel and

Table 3 Results of the one-way ANOVA model

Source	SS	df	MS	F	Prob > F
Between groups	423.65	4	105.91	124.21	0.0000
Within groups	80048.85	93,878	0.85		
Total	80472.50	93,882	0.86		
Bartlett's test for equal variances: chi2(4) = 211.2846 Prob > chi2 = 0.000					

Table 4 Results from the NLS model

Rating	Coef.	Robust std. err.	t	P > |t|	[95% conf. interval]	
Business	−0.076	0.011	−6.66	0.000	−0.098	−0.053
Couple	0.086	0.011	7.81	0.000	0.065	0.108
Family	−0.043	0.012	−3.72	0.000	−0.065	−0.020
Friends	−0.043	0.013	−3.19	0.001	−0.069	−0.017
Hotel_H	0.518	0.007	70.71	0.000	0.504	0.533
Hotel_L	−0.402	0.029	−13.77	0.000	−0.459	−0.345
PLevel_H	−0.041	0.007	−5.84	0.000	−0.055	−0.028
PLevel_L	0.065	0.007	9.27	0.000	0.052	0.079
_cons	3.793	0.011	330.26	0.000	3.770	3.815
F(8, 93874) = 706.81; Prob > F = 0.0000; R-squared = 0.0642						

middle-level reviewer experience as omitted variables (reference variables) to avoid multicollinearity of categorical variables regression. Table 4 displays the coefficient estimates for the variables included in the model. As can be seen, relative to the solo group, there is a positive relationship between the couple group and rating, while travellers with other trip types gave lower satisfaction ratings. Also, travellers who had more experience tended to give lower ratings, indicating that personal experience also influence satisfaction level. As Banerjee and Chua (2016) stated, hotel properties may shape the rating patterns. In terms of hotel attributes, the coefficients of hotel level were different, suggesting travellers gave upscale hotels higher ratings.

5 Discussion and Implications

Through this study we gained some preliminary understanding of the differences in satisfaction rating across trip types and experience levels. According to the results, travellers with the couple trip type seemed to have higher level of satisfaction and travellers with more trip experience tended to give lower ratings. It seems some psychological factors played a role in shaping travellers' evaluation of hotel products.

A person's mood may directly affect a judgment of the events, hence mood-state-dependent retrieval of information is indicated (Wright & Bower, 1992). Happiness effect is considered to influence travellers' mood state. Happiness refers to people's feelings or cognitive and affective evaluations of their lives, and it is often used interchangeably with the term subjective well-being (Diener, 2000). There are many individual and environmental factors correlated to happiness. According to Watson (1930), a happy home and good relationships with other people, including a spouse, were conducive to happiness, which was supported by many other studies like Wessman (1956) and Wilson (1967). Generally, marriage and family help improve individual happiness to some extent. Argyle (2013) concluded that happiness depends partly on objective conditions such as being married.

Happiness is closely related to satisfaction with life and other activities. A plethora of previous psychological studies on the effects of happiness have shown that happiness has positive effects for both the individual and society. Veenhoven (1983) points that married persons are easier to be satisfied than the unmarried and have more positive social effects. However, few prior studies on the effects of happiness specifically in a service context have been conducted. Hellén and Sääksjärvi (2011) is only one work we found through our energies on searching the Internet. The result in this study seems to be consistent with the happiness effect stated in prior researches.

In terms of experience level, the preliminary result is somewhat different from the findings in the Liang et al. (2016) study. We found that customer online review experience has a negative effect on customer satisfaction. Cognitive psychological theory stresses the role of cognition and suggests that customers tend to deal with information according to their knowledge. In the era of tourism e-commerce, reviewers posing more comments are considered to have more trip experience, which would help them get more tourism knowledge. Capraro, Broniarczyk, and Srivastava (2003) show that consumer knowledge plays an important role in the likelihood of customer defection. Tuu, Olsen, and Linh, (2011) confirm that objective knowledge has moderating effect in the satisfaction-loyalty relationship.

Although the role of knowledge has been extensively studied in literature, whether more knowledge leads to less satisfaction remains uncertain. However, we could think of it from two angles. Intuitively, it is less likely for a new product or service to excite the curiosity of a person who has more knowledge and experience. In addition, a more knowledgeable person tends to possess higher requirements and expectations, so it is more easily for them to discern more defects. A good explanation could be that people with prior experience are more demanding when evaluating hotel services (their expectations are more and more high according to disconfirmation paradigm). These two angles may help explain the result in this study.

6 Conclusions

Traveller satisfaction is an essential indicator of a hotel's performance; however, few studies have explored both the cross-person difference and cross-hotel variation in customer satisfaction. This study performs a preliminary analysis of relationships between traveller characteristics and hotel review ratings. We found that couple group and travellers having less trip experience tend to have higher satisfaction and propose that happiness effect also works in the online environment. This study also offers a preliminary understanding of psychological causes of variations in review ratings by applying happiness theory and cognitive psychology to the online environment in the hospitality industry. This study also has limitations. For example, there may be other influential factors like region effect (i.e., where the reviewers are from) are unaccounted for. Future studies could include more factors especially review textual contents to gain a deeper understanding of the phenomenon.

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Which Is More Important in Online Review Usefulness, Heuristic or Systematic Cue?

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Abstract Online reviews are significant in the hotel and tourism industry because hotel accommodations and travel products are high-risk products due to their inherent intangibility. However, because of high information load on the Internet, the issue that identifies factors influencing potential customers' perception about online reviews has been treated as crucial. Drawn from the Heuristic-Systematic Model (HSM), this study investigated the roles of heuristic and systematic cues of online reviews affecting potential hotel customers' perception about it. In this study, reviewers' identity, level of the reviewer, review star ratings, and attached hotel photo were identified as heuristic cues, whereas review, length, cognitive level of review and negativity in review constitute systematic cues. A binary logistic regression was adopted and only systematic cues of online reviews were found to affect the usefulness of it. Moreover, we investigated the moderating effects of seasonality in the relationships between systematic cues of online reviews and usefulness.

Keywords Heuristic-systematic model · Online hotel reviews · Usefulness of online reviews

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1 Introduction

Recently, many consumers rely on online review platforms because these platforms allow consumers to socially interact with other people and exchange information (Racherla & Friske, 2012). In particular, TripAdvisor made a profit of $4 billion in 2012 and practitioners anticipated that sales figures will increase annually (NEWSPIM, 2012). Additionally, many consumers acquire travel information through TripAdvisor and spend 200 min a month on this platform for traveling planning purposes (NEWSPIM, 2012). Therefore, online reviews are very important in the hotel industry because hotel products are considered as high-risk products due to their inherent intangibility (Lin, Jones, & Westsood, 2009). Likewise, numerous online review platforms (e.g. TripAdvisor, Yelp) emerge and many consumers plan to travel through those platforms. A recent study by Ady and Quadri-Felitti (2015) investigated the impacts of online reviews and found that online reviews play a crucial role when making a booking decision for both business and leisure travellers. Accordingly, many researchers examined the influence of online reviews on travel behaviours (Filieri, Alguezaui, & McLeay, 2015; Liu & Park, 2015; Vermeulen & Seegers, 2009).

Meanwhile, Zhang, Wu, and Mattila (2016) argued that the considerable volume of travel information could make consumers decision making process complicated. Therefore, from a consumers' standpoint, distinguishing useful travel information among a large amount of information is a very critical issue in online review platforms (Liu & Park, 2015). In this way, consumers may use cues composing an online review to judge the usefulness of the online review. The Heuristic-Systematic Model posits that people could process information heuristically and systematically. In other words, consumers may interactively use both relatively simple cues (heuristic processing) and content of the review (systematic processing) when they process information. Therefore, the aim of this study is to identify heuristic and systematic cues composing online reviews. Also, this study will examine the effect of these cues on usefulness of online reviews.

2 Theoretical Background

2.1 Online Hotel Review

Online reviews have an impact on consumers' decision making. Especially, credibility of online reviews based on quality of products or service is a very salient concept because consumers are able to infer their quality (Liu & Park, 2015). That is, consumers can reduce uncertainty of products or services through credible online reviews (Sussman & Siegal, 2003). Thus, from a consumers' point of view, online reviews are very useful when they decide to purchase a product or service.

From a hospitality and tourism perspective, due to products of hotel and tourism intangibility, usefulness of online reviews is regarded as a more significant factor (Lin et al., 2009). Usefulness of online reviews indicates that consumers perceive specific reviews as useful and helpful (Schuckert, Liu, & Law, 2015). The usefulness of online reviews not only helps finding useful information between different types of information, but giving confidence in consumer's decision making (Sussman & Siegal, 2003). Recently, there is a function on a lot of online review platforms that consumers can vote for the usefulness of online reviews. This function gives value to specific information among various information in platforms (Mudambi & Schuff, 2010). Mudambi and Schuff (2010) identified factors that have influence on usefulness of reviews. They found that elaborateness of online reviews has a positive effect on the perceived helpfulness of online reviews. According to Liu and Park (2015) a usefulness score that other people give, has an impact on the perception of usefulness of reviews when consumers read online reviews. Lee, Law, and Murphy (2011) examined useful reviewers on TripAdvisor, and they found that useful reviewers are behaviourally and demographically distinct from general reviewers.

2.2 Heuristic-Systematic Model

Consumers tend to engage in a dual—process when they process information. Many dual-process researches have largely employed Heuristic-Systematic Model (HSM) and Elaboration Likelihood Model (ELM). This study chose HSM for several reasons. First, according to Zhang and Watts (2008) HSM is employed in a wider range of validity-seeking contexts than ELM because ELM was specifically designed for persuasive messages. Second, HSM explains that the dual-process can arise simultaneously and influence each other.

HSM suggests two different modes of information processing (Chaiken, 1980). The heuristic process is requiring less effort and more expeditious because of using easily perceived cues. Therefore, when consumers involve in a heuristic process, they depend on more available information such as non-related content cues or identity of source. Whereas, a systematic process allows consumers to evaluate, elaborate, and construe a message content. This systematic process is based on the reaction of a message argument quality and it is related to the strength of persuasive and validity (Eagly & Chaiken, 1993). These two modes of information processing can have complementary effects in various contexts (Chaiken & Ledgerwood, 2012). Therefore, consumers may engage in both heuristic and systematic processing when they process information of online reviews. Zhang and Watts (2008) explained consumers' knowledge adoption in online community by using HSM. Zhang, Lee, and Zhao (2010) also employed HSM to clarify the effect of online reviews on consumer decision making. This study also investigates factors influencing usefulness of online reviews in a hospitality context through HSM.

3 Theoretical Framework and Hypotheses Development

The aim of this study is to identify factors influencing usefulness of online reviews. Taking into consideration previous literature, we propose the research model in Fig. 1.

3.1 Heuristic Cues

3.1.1 Reviewer's Identity

Online identity can be defined as "a social identity that an individual establishes in online communities and/or website" (Liu & Park, 2015, p. 142). Consumers who search for information in an online context may perceive more uncertainty than in an offline environment because they cannot acquire enough social cues about a source (Tidwell & Walther, 2002). Thus, source identity plays a role in reducing consumers' uncertainty (Tidwell & Walther, 2002). Sussman and Siegal (2003) asserted that source identity enhances credibility of information, consequently, the information is recognized as useful (Kusumasondjaja, Shanka, & Marchengiani, 2012). Therefore, the following hypotheses are proposed:

H_1: Reviewers' real name has an effect on the usefulness of reviews.
H_2: Reviewers' real photo has an effect on the usefulness of reviews.

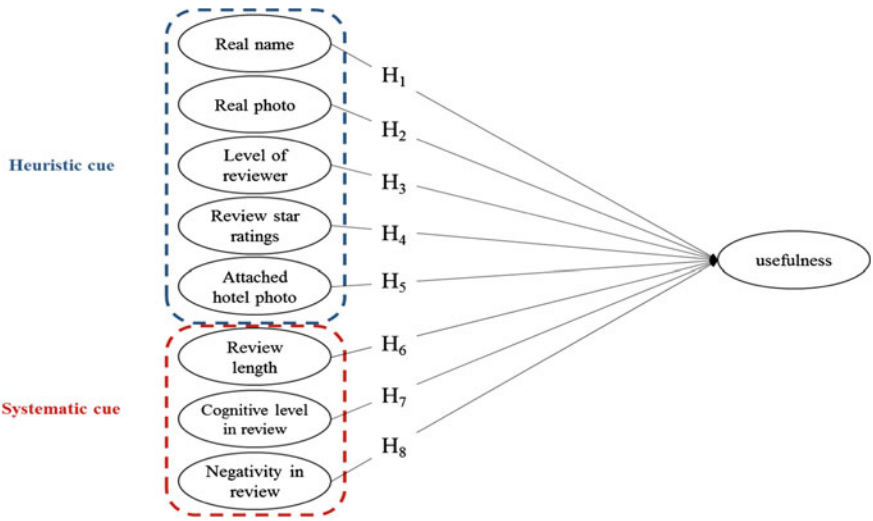

Fig. 1 Proposed research model

3.1.2 Level of Reviewer

The level of reviewer refers to the number of levels allocated by his or her previous activities. That is, the more reviews a reviewer has posted, the higher his or her level. This level of reviewer can influence others' perception, for example, a reviewer who has level 4 can be perceived as more expert than others who have lower levels than 4. Thus, if reviewer's level is higher, this signify that the reviewer is considered as an expert. Gilly, Graham, Wolfinbarger, and Yale (1998) argued that consumers tend to pay attention to expert's opinion when making decisions (Liu & Park, 2015). In an online context, consumers cannot attain enough about a reviewer's social background (Liu & Park, 2015), so that they depend on a reviewer's past behaviours (e.g. the number of reviews written) (Weiss, Lurie, & Maclnnis, 2008). In this vein, Willemsen, Neijens, Bronner, and Ridder (2011) found a positive relationship between expertise message and the perceived usefulness of a review. Therefore, the following hypothesis is proposed:

H_3: Level of reviewers has an effect on the usefulness of reviews.

3.2 Review Star Ratings

Review star ratings are the number of stars assigned by reviewers. These ratings indicate the evaluation of a product or service used (Liu & Park, 2015). Review star ratings are a helpful cue for consumers because they can infer the quality of products or services by using these ratings. According to Wei, Miao, and Huang (2013) consumers perceived lower hotel ratings to be more useful. Therefore, the following hypothesis is proposed:

H_4: Review star ratings have an effect on the usefulness of reviews.

3.3 Attached Hotel Photo

Vivid information is more appealing and more likely to be remembered than non-vivid information (Sundar & Kalyanaraman, 2004). According to Jin, Yang, and Lee (2013), reviews inserted in photos and videos have higher abundance than text-based reviews. That is, a review embedded in multimedia is perceived to be more useful. Therefore, the following hypothesis is proposed:

H_5: An attached hotel photo has an effect on the usefulness of reviews.

3.4 Systematic Cues

3.4.1 Review Length

The review length is related to content richness. Chevalier and Mayzlin (2006) explained that review length implies reviewer's involvement and they found that the amount of information in reviews has a positively influence on overall sales of the related product (Racherla & Friske, 2012). In a similar vein, Mudambi and Schuff (2010) found that a review not only contains associated product or service information, but also the longer a review it is the more detailed information it contains for a product or service. Therefore, the following hypothesis is proposed:

H_6: Review length has an effect on the usefulness of reviews.

3.4.2 Cognitive Level of a Review

A review may include both aspects an affective and a cognitive message. An affective message contains feelings and emotions toward a product or service, whereas cognitive message contains beliefs about attributes of a product or service (Fabrigar & Petty, 1999). Byun and Jang (2015) stated that a cognitive message contains more credible and accurate information than an affective message because it is objective. That is, if reviewers provide a concrete and cognitive message, the review is more compelling (Pera, Viglia, & Furlan, 2016). Therefore, the following hypothesis is proposed:

H_7: The cognitive level of a review has an effect on the usefulness of reviews.

3.5 Negativity in Reviews

Kanouse (1984) argued that consumers are inclined to have a negative bias, thus they pay more attention to negative messages than positive ones (Baek, Ahn, & Choi, 2012). Willemsen, Neijens, Bronner, and De Ridder (2011) found that negativity has a positive impact on the usefulness of online reviews. Particularly, a negative bias has a stronger persuasion when consumers make a high involvement decision (Martin & Marshall, 1999). Hotel products are considered as high involvement products. Accordingly, consumers may have a negative bias when making a hotel booking decision. Therefore, the following hypothesis is proposed:

H_8: Negativity in reviews has an effect on the usefulness of reviews.

4 Methods

4.1 Hotel Selection

Tripadvisor is one of the predominant online review platforms where millions of travellers post and read travel-related reviews, compare hotel prices and book (Tripadvisor, 2016). Through this platform, we collected online reviews of hotels located in Seoul, capital of South Korea (hereafter Korea) since Seoul is one of the most famous tourism destination cities. Specifically, Seoul is ranked in 9th on Global Top 20 top destination cities by international overnight visitors (Hedrick-Wong & Choong, 2015). Seoul has a considerable number of tourism attractions from cultural heritage to shopping malls and 233 hotels including 24 super deluxe hotel (Seoul Statistics, 2016). According to the Korea Tourism Knowledge and Information Systems, 80.4% of visitors of Korea were found to visit Seoul (International Visitor Survey, 2016). In order to minimize bias issues resulting from hotel classification and different geological and strategic positions of hotels, we selected 3-star hotels and 5-star hotels which are local and contemporary hotels located in Myung-dong of Seoul. Moreover, in order to raise the quality of data, we truncated the range of hotels to Top 10 hotels in Seoul on TripAdvisor. As a results, Lotte Hotel Seoul and Metro Hotel were chosen as representatives of 3-star and 5-star hotels respectively. All of the online reviews about these hotels posted during the one year period from January 1st to December 31st, 2015 were collected to minimize bias issues resulting from seasonality. Excluding 58 reviews which closed information about reviewers, a total number of 287 reviews (5-stars hotel: 184, 3-stars hotel: 103) was employed.

4.2 Data Collection and Analysis

The data was collected manually by researchers since heuristic cues and dependent variables including real photo, real name, attached hotel photo and review usefulness were binary variables to be measured: as ‘1’ if reviewer disclose his own photo, own name, hotel photo and receive usefulness score, and ‘0’ otherwise (Fig. 2). A real photo was measured whether a reviewer’s photo can be clearly identified as his/her own face. Further, systematic cues including review length, cognitive level of a review and negativity in a review were measured with LIWC (Linguistic Inquiry and Words Count) 2015 program. This program is able to sort a text into 80 word categories from linguistic categories (e.g. personal pronouns, verbs, tenses, etc.) to psychological categories (e.g. cognitive, perceptual, and social) (Pennebaker, Booth, & Francis 2007). For instance, words such as ‘think’, ‘must’ were classified as cognitive words, ‘feel’ and ‘great’ as affective words, and ‘hurt’ and ‘ugly’ as negative words. By using LIWC 2015 program, we calculated the proportions of cognitive words, affective words and negative words in each review content. Then, we compared the proportions of cognitive words and affective words, measured as ‘0’, if a proportion of affective words of a review is

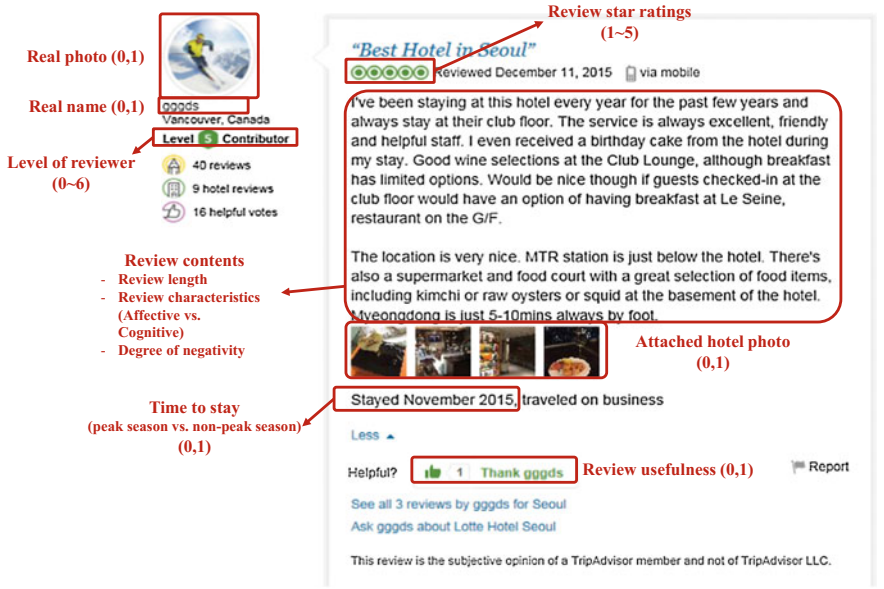

Fig. 2 Information of the variables in online review

greater than that of cognitive words, and '1' otherwise. Degree of negativity was measured by the percentage of negative words in each review. Meanwhile, this study adopted binary logistic regression since the dependent variable (review usefulness) is dichotomous and measured with '1' or '0' whether a review receives a 'thanks reviewer' or not.

Binary logistic regression was employed due to its' ability of permitting that independent variables are measured by different measurement scales from dependent variables (Adam & Adongo, 2016). The review usefulness can be described as follows:

$$RU = \beta 0 + \beta 1^{*} realname + \beta 2^{*} realphoto + \beta 3^{*} levelofreviewer + \beta 4^{*} starratings + \beta 5^{*} hotelphoto + \beta 6^{*} reviewlength + \beta 7^{*} cognitivelevelofreview + \beta 8^{*} negativityinreview$$

where RU represents review usefulness and β0 represents constant.

5 Results

5.1 *Descriptive Analysis of the Variable*

Table 1 shows explanations of descriptive statistics for the variables. It was found that most of the reviewers avoid providing their real name (N = 260, 75.4%), real photo (N = 252, 73.0%) and hotel photos they took (N = 247, 86.1%), which

Table 1 Explanation and descriptive statistics for the nominal variable

Variable	Conceptualized definition	# of Yes (%)	# of No (%)
Real name	Refers to whether reviewer discloses his/her real name	85(24.6)	260(75.4)
Real photo	Refers to whether reviewer discloses his/her real photo	93(27.0)	252(73.0)
Attached hotel photo	Refers to whether reviewer attaches photos of hotel	40(13.9)	247(86.1)
Cognitive level of review	Refers to whether a review is affective or cognitive (0 = affective, 1 = cognitive)	Affective = 191 (66.6)	Cognitive = 96 (33.4)
Review usefulness	Refers to whether a review receive 'thanks reviewer	130(45.3)	157(54.7)

Table 2 Explanation and descriptive statistics for the ordinal variable

Variable	Conceptualized definition	Min	Max	Mean	Median	S.D.
Level of reviewer	Refers to reviewer's level in TripAdvisor	0	6	3.37	4	1.95
Review star ratings	Refers to the ratings that reviewer evaluates about hotel	1	5	4.54	5	0.67
Review length	Refers to the number of words in each review	28	775	148.79	107	119.92
Negativity in review	Refers to percentage of negative words in each review	0.00	32.14	4.07	3.55	4.00

indicates a low level of identity disclosure. In addition, the average level of reviewers was 3.37 (S.D = 1.95), with an average of review's star rating was 4.54 (S.D = 0.67). With regard to systematic cues of the reviews, on average review length was 148.79 (S.D = 119.92). More than half of the reviews were found to be affective (N = 191, 66.6%), which means hotel customers tend to post affective reviews rather than cognitive reviews. On average negativity in reviews was 4.07 (S.D = 4.00), indicating the percentage of negative words in each review was relatively lower than expected. Finally, less than half of the reviews received a usefulness score (N = 130, 45.3%), whereas the other reviews have no usefulness score (N = 157, 54.7%) (Table 2).

In order to assess multicollinearity, we calculated the Variance Inflation Factor (VIF) and tolerance values of each independent variable (see Table 3). Generally, it is required that the tolerance surpasses 0.1 and VIF is lower than 4 (O'Brien, 2007). Therefore, it was found that there is a little concern about multicollinearity between independent variables.

Table 3 Collinearity estimation

Dependent variables	VIF	Tolerance
Real name	1.051	0.952
Real photo	1.043	0.959
Level of reviewer	1.110	0.901
Review star ratings	1.087	0.920
Attached hotel photo	1.067	0.937
Review length	1.191	0.840
Cognitive level	1.305	0.766
Negativity in review	1.205	0.830

5.2 *Result of Main Hypotheses*

The overall model fit of our binary logistic regression was assessed with the Likelihood Ratio Test, Hosmer and Lemeshow's Chi-square, Cox and Snell's R^2 and Nagelkerke's R^2 (Djekic & Loebbecke, 2007). First, initial −2 log likelihood value for the constant-only model (395.323) was reduced to 353.301 in the research model, an improvement of 42.022 and this change was significant (Chi-square = 42.021, df = 8, $p < 0.001$). Second, the significance probability value of Hosmer and Lemeshow's Chi-square is 4.451 which is much greater than the significance level of 0.05, thus, a regression model was found to be acceptable. Additionally, Cox and Snell's R^2 was 0.136, Nagelkerke's R^2 was 0.182 and predictor power was 68.6%.

The results show that only systematic cues have influence on review usefulness (Table 4). To be more specific, review length was found to positively influence review usefulness (Wals = 9.389, $p < 0.01$), one more word in a review is 1.004 times as likely to get a usefulness vote (Exp (B) = 1.004). Moreover, the cognitive level of reviews was found to have an impact on review usefulness (Wals = 5.854,

Table 4 Results of logistic regression (main hypotheses)

Hypotheses		B	S.E.	Wals	P	Exp (B)	Results
H_1	Real name	0.219	0.310	0.497	0.481	1.244	Rejected
H_2	Real photo	0.061	0.301	0.041	0.840	1.063	Rejected
H_3	Level of reviewer	−0.033	0.069	0.223	0.637	0.968	Rejected
H_4	Review star ratings	−0.155	0.193	0.645	0.422	0.856	Rejected
H_5	Attached hotel photo	−0.619	0.391	2.507	0.113	0.538	Rejected
H_6	Review length	0.004	0.001	9.389	0.002^{**}	1.004	Supported
H_7	Cognitive level of review	0.762	0.315	5.854	0.016^{*}	2.142	Supported
H_8	Negativity in review	−0.182	0.041	19.299	0.000^{***}	0.834	Supported

Likelihood ratio tests: Chi-square = 42.021(df = 8, $p < 0.001$), Model fitting criteria: −2Log likelihood = 353.301

Pseudo R-square: Cox and Snell $R^2 = 0.136$, Nagelkerke $R^2 = 0.182$

Hosmer and Lemeshow test: Chi-square = 4.451 (df = 8, p = 0.785), Classification accuracy = 68.6%

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

$p < 0.05$), cognitive reviews are 2.142 times more likely to get a usefulness vote than affective reviews (Exp (B) = 2.142). Thus, it means that the more cognitive words are used in a review, the higher a possibility of being perceived as useful. Finally, Negativity in a review has a negative effect on review usefulness (Wals = 5.854, $p < 0.05$), one more negative word in a review is 0.834 times more likely to get usefulness vote (Exp (B) = 0.834). Thus, this means that the less negative words are used in a review, the higher a possibility of being perceived as useful is. Therefore, hypotheses H_6–H_8 were supported while hypotheses H_1–H_5 were not.

6 Discussion and Conclusion

Heuristic cues provide consumers with simple information that can be easily judged whether it is useful or not. Thus, if consumers employ a heuristic process, they tend to access the review's usefulness with peripheral cues (i.e. reviewer's real photo and real name, level of reviewer, etc.) (Chaiken, 1980). On the other hand, when consumers are involved in a systematic process, they make an effort to acquire abundant information related to a hotel product (Chaiken, 1980).

This study shows two somewhat surprising results. The first one is that heuristic cues were not validated as significant predictor of review usefulness. This indicates that when online hotel review readers assess the review usefulness, they consider review's message-relevant contents as more important than simple subset of available information embedded in online reviews. That is, since hotel products are experience product, consumers try to acquire information in order to reduce their risk (Kassinis & Soteriou, 2015; Zeithaml, 1988). This result is somewhat similar with the result of Liu and Park's (2015) study in that qualitative components of reviews were validated as the strongest predictors of review usefulness.

The second result is the negative impact of review negativity on review usefulness, which are contrary to the results of previous studies (e.g. Baek et al., 2012; Willemsen et al., 2011). This might be because previous studies selected tangible products (e.g. sunscreen, espresso machine, running shoes and etc.), which can be assessed more objectively than intangible ones. Hotel services are intangible, thus the quality of them tends to be assessed by customer's subjective judgement. This can be explained by heterogeneity, which is one of the features of service. The results of this study enable us to infer that online hotel review readers can recognize the heterogeneity of hotel services and try to objectively assess online reviews without reviewer's characteristics and subjective and negative assessment.

Based on these results, the present study provides theoretical and practical implications. One of the theoretical implications of the present study is that we found the importance of systematic cues of online hotel reviews. A considerable number of previous studies have focused on only heuristic cues of online reviews since these cues are easy to collect and analyse. According to Liu and Park (2015), it is needed to investigate review's qualitative factors in order to deeply and

completely understand the factors influencing its usefulness. In this vein, the results of this study (significant impacts of systematic cues of online review) can be regarded as meaningful. Second, we provided more precise results by collecting real online review data. Most of previous studies tend to employ limited data collection methods such as experiment-based or scenario-based surveys, which induces social desirability, common method bias and makes it hard to generalize results. On the other hand, the present study can be regarded that it is relatively free from these problems by manually collected real online review and analysing the words composing a review. As practical implications, this study can provide valuable insights with online marketers of hotels. First, since long and cognitive reviews have an impact on review usefulness, online review platform managers should put this review up a notice in a conspicuous place. Second, our findings show that less negative reviews have an impact on usefulness of online reviews, therefore, hotel marketers should focus on managing these reviews.

However, there are also limitations that further studies should address. First, although this study selected two hotels with different grades in order to minimize bias caused by differences between hotel grades, it is hard to generalize the results since we collected online review posted for hotels located in one city (Seoul) by using one website (TripAdvisor) as an exemplary. Therefore, future study should collect data from various websites and hotels located in several cities. Second, we ignored the relationships between hotel review usefulness and customer's behaviour such as reservation, word-of-mouth, and intention to visit a hotel. Therefore, further studies are required to expand the research scope to online hotel review readers' behaviour in order to provide more practical implications to the hotel industry. Third, the review length is the only ratio variable of the regressor, therefore, there is a possibility that the results can be odd. Accordingly, future research need to transform this variable into a likert one using quartiles statistics. Fourth, results showed a low level of impact of the review length on review usefulness—this should be interpreted carefully. Finally, consumers can narrow down the number of reviews to look at when they are involved in the funnel process (Sirakaya & Woodside, 2005). Consequently, research is required to examine the consumers decision making process with regards to selecting online reviews.

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Authenticity and Tourism: What TripAdvisor Reviews Reveal About Authentic Travel to Marrakech

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Abstract Ubiquitous in commercials and tourism brochures, the term authenticity is used in a wide array of meanings ranging from objective to subjective. In an attempt to overcome this deficiency, this article aims to identify how tourists define the authenticity of a travel experience. For this, it engages in a semantic analysis of reviews posted in TripAdvisor by travelers to Marrakech and its surroundings. The platform was chosen among others due to its currently predominant role in assisting tourists and helping them share their experiences. A total of 361 reviews were collected from 160 tourism establishments—40 each of four types of establishments, being the riad guest house, hotel, restaurant, and rural guest house—selected from the ranking of the best tourism establishments proposed by TripAdvisor. The three dimensions of authenticity found in the literature—originality, singularity and identity—were then associated with the four types of tourist accommodations. The "originality" dimension proved to be strongly associated with riad guest houses, the "singularity" dimension with hotels and restaurants, and the "identity" dimension with rural guest houses.

Keywords Authenticity · Marrakech · Tripadvisor · Originality · Singularity · Identity

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1 Introduction

Considered essential, the concept of authenticity is a key topic in the business world and the scientific community alike. Authenticity appears to have become an important, or even determinant, attribute in the choices and actions of consumers (Cova & Cova, 2001) and a major strategic tool for differentiation, positioning and the overall evaluation for brands, products and tourism destinations (Camus, 2000). Authenticity is often used as a selling point and is employed in efforts to give meaning to experiences and urban or rural sites. In search of the authenticity deemed lost in the course of industrialisation and modernisation, tourists often use the adjective 'authentic' when talking about their travel experiences. However, they do not necessarily have a common definition of that word. Whether used to refer to a cognition or emotion of originality, ancestral tradition or the notion of otherness, be it for personal reasons or in a business context, the term authenticity embodies the myth of an imaginary of the other, a credo of an alternative tourism, or a grounded and rooted lifestyle from a time gone by (Badot & Cova, 2003; Amirou, 1995).

While the quest for authenticity is certainly not new, it has probably never been as sought for and requested as today. Indeed, authenticity has become a topic of scientific debate within and between those academic disciplines that are able to exert some influence on the tourism sector. An analysis of articles on authenticity testifies to the research attention that the concept has drawn from a number of authors from various disciplines. However, many gray areas remain to be clarified. To our knowledge, little research to date has analyzed the semantic meanings of authenticity in the mediated discourse of tourists. We cite the case of Mkono (2013), who through a netnographic analysis performs a comparison of the perception of authenticity held by Western tourists on the one hand and African tourists on the other.

The relationship between authenticity and tourism is not new. Ever since the seminal writings of MacCannell from the 1970s (1976, 1973), the concept has not ceased to arouse the curiosity of researchers hailing from disciplines such as sociology, anthropology, ethnology and marketing.

Tourism has entered a phase of profound change not only with the advent of Web 3.0 and the development of the semantic web but also with the gradual empowerment of consumers through social media. The latter have become crucial interfaces for establishing lasting relationships with clients and for triggering electronic word-of-mouth communication. In this new era, consumers are no longer considered to be merely recipients. Instead they are seen as partners who are to be inspired and relied on, especially when it comes to developing the branding of a destination.

Exegesis, literary criticism or content analysis—all these methods aim to "get the texts to talk," that is to say, to find out how to read and comment on them, or to extract their meaning. That approach is very old and derives from a longstanding literary tradition. The general method of semantic analysis subscribes to the

principles of distributional semantics established by Bloomfield (1933) and developed in the context of multiple streams of linguistics, including that of applied linguistics. Distributional semantics provides a linguistic basis for the automatic semantic analysis of textual data. Applied to the lexical field, distributional semantics assumes that terms having a similar contextual distribution (context) have similarity in terms of meaning. In this way, through the study of co-occurrences of a term and of the contexts favouring (or not) its appearance, it becomes possible to capture its semantic behaviour and clarify its meaning.

The literature review revealed two findings about the concept of authenticity. One, two scientific disciplines, namely anthropology and marketing, predominate in imposing their approach to this concept. Secondly, there is a definitional deficit as well as a fragmentation of the definition of authenticity, which is characterized by a split between intrinsic signals (experiences, characteristics of objects, etc.) and extrinsic signals (explicit messages and discreet signals, etc.).

To shed light on the concept of authenticity, this article presents a semantic analysis conducted of the reviews posted by travellers in TripAdvisor of riad guest houses (A riad is an ornately decorated traditional house, most of these buildings have been converted into guest houses), hotels or restaurants in Marrakech or of rural guest houses around Marrakech. The article includes a description of the theoretical framework, a methodology, and a presentation and discussion of the results, and ends with a conclusion on the contributions and limitations of this work and suggestions of avenues for future research.

2 Theoretical Framework: Authenticity and Tourism, Polysemic Richness and a Proliferation of Theories

Authenticity is a polymorphic concept and has different facets. Camus (2003, 2004) discusses a number of these facets, from objective and subjective to correlated, and proposes a hybrid model based on the three dimensions originality, singularity and identity. The quest for authenticity is certainly not new, though it has probably never been as much in demand. MacCannell (1973) introduced the concept of authenticity in tourism studies by associating it with modernity. The author argues that in the era of modernity, individuals, removed from 'real life', cut off from their roots and alienated, conceive of reality and authenticity as belonging to other periods of history or other purer and simpler lifestyles. Badot and Cova (2003) note a shift from values revolving around the future and 'the other' to the past and the local. 'The allure of the past and proximity seems increasingly to outweigh that of a glitzy future of an interconnected planet' (Badot & Cova, 2003, p. 85).[1] However, what exactly fascinates tourists about the traditional and the ancestral? Usually, viewing something as authentic means to perceive it as being defined and known. It

[1]Our translation.

is this trait that gives the genuine product the typicality that allows it to be recognised and shared (Dion et al., 2010). The notion of the origin evokes a positively marked history, a particular symbolic value and a sublimated past (Kessous, 2009). Camus (2002) identified six authentic realms of originality. Origin may refer to a time (archaeological origin), a creator (inspirational origin), place (spatiological origin), a culture (ritualised origin), nature (natural origin) or a technique or technology (technical or technological origin).

The perceived contrast, singularity and distinction of the object in relation to surrounding objects seem to accentuate the perceived effect of authenticity. According to Durkheim, "[i]f societies need to set apart a certain portion of their environment, marking it as 'sacred,' singularization is one means to this end"[2] (1915, cited by Filser, 1994: 209). According to Belk (1995), singularity is the characteristic of a thing that is unique in its category, that has no equivalent, and that becomes a rare and sacred good. Rosselin (1994), for his part, associates authenticity with a process of rupture in the sense that authenticity is all the more prominent when it is unique and surrounded by indiscriminate, homogeneous, ordinary, common and ordinary elements. For MacCannell (1973), the tourist in search of authenticity seeks "the other," even if that other is staged.

On a different note, Steiner and Reisinger (2006) remind us that "authenticity […] is part of a long philosophical tradition concerned with what it means to be human, what is means to be happy, and what it means to be oneself" (p. 300). The authors underline the ontological character of authenticity by defining it not as a social fact but rather as an issue related to the human experience, in other words, a person's existence, states of feeling and concerns (Turner & Manning, 1988). Thus, existential authenticity is defined as a special state of being in which one is true to oneself, or, according to Selwyn (1996), a feeling resulting from the experience of one's real self, a liminal state in which the individual feels to be in direct and intimate contact with him or herself. In this sense, Taylor (2001) argues that human existence finds its meaning only in the affirmation of the self, its own nature and its autonomy.

3 Methodological Framework

Within one decade, TripAdvisor has profoundly changed the tourism sector, including the ways in which consumers book tourism services (e.g., transportation, accommodations, restaurants, entertainment). For example, consumers today no longer rely only on the official statements issued by the tourism providers. Instead they want to know what others tourists are saying.

Tourists are more and more inclined to share their experiences on social networks as well as with the public. These expressions are invaluable to tourism

[2]Our translation.

Table 1 Distribution of the sample

Type of establishment	Number of establishments	Number of selected reviews
Hotel	40	57
Rural guest house	40	93
Riad guest house	40	134
Restaurant	40	77
Total	160	361

businesses and destinations. TripAdvisor is one of the most reputable platforms in the tourism industry. In its Travellers' Choice 2015[3] awards, Marrakech tops the list of the best tourism destinations in the world. Their rating was conducted following the collection of more than 200 million traveller reviews and opinions about hotels, restaurants and attractions for one year, namely 2014, using various criteria of quality and quantity.

The reviews we selected had been posted in TripAdvisor between February 2014 and the end of January 2015 by travellers to Marrakech who had gone to one of the following four types of tourism establishments: riad guest houses, hotels, restaurants and rural guest houses (see Table 1). The choice of these establishments was based on the diversity of the types of clients they together represent, which is evidenced by the reviews analysed in the present document.

The main selection criterion of the reviews was that they revolve around, either explicitly or implicitly, the concept of authenticity. The reviews were also selected in consideration of the seasonality of the tourism year, so as to avoid possible biases due to seasonal variations.

The data collection method consisted of identifying TripAdvisor reviews having one or more than one occurrence of the term *authenticity* or of derivatives of the term such as *authentic* or *authentically*. A total of 361 reviews were collected from 160 tourism establishments—comprised of, 40 each, the four types of establishments, being Riad guest house, hotel, restaurant, rural guesthouse—selected from the ranking of the best tourism establishments proposed by TripAdvisor. The choice was to serve as a representative sample of tourism establishments from which to collect the body of customer reviews.

The analysis of the reviews involved computing frequency and proximity statistics of words used in the text body and was performed using the software IRAMUTEQ (version 0.7 alpha 2). Referred to as lexicometry, or simply text analysis, such an analysis can be conducted with a number of methods for reorganising text sequences and creating statistics on words using segmentation (Salem, 1986). For Reinert (1983), the study of repetitions in a discourse allows to become aware of ideological trends, conflict zones, disruptions, rapprochements or oppositions, which he termed 'lexical worlds'.

[3]http://www.tripadvisor.fr/TravelersChoice-Destinations-cTop-g1, consulted on April 27, 2015.

Use of the software IRAMUTEQ requires organising the data from the selected reviews according to specific variables. In this research, the variables are the types of tourism establishments about which the reviews were posted, being riad guest houses, hotels, restaurants and rural guest houses. After entering the data according to these four variables, the software performed an automatic analysis that deconstructed the original text and reorganised it based on the repetition and sequence of words, generating a result that required further interpretation by the researcher.

4 Results and Discussion

In the following section, we will present a discussion of the results generated by IRAMUTEQ for the tourism destination Marrakech.

4.1 Results

The final body of data consists of 15,873 occurrences and of 2,362 different forms (Forms represent words, numbers and all unrecognised forms used in a text). The functions of text statistics (lists and counts) helped to highlight the frequency of words used in a descending order. The results are based on tools offered by the software for visualising the broader themes outlined by the active forms (By default, the active forms in the software represent all kinds of words except: adjectives, adverbs, conjunctions, onomatopoeia, demonstrative pronouns, indefinite pronouns, personal pronouns, possessive pronouns, relative pronouns, prepositions and auxiliary verbs) of the body of data.

The IRAMUTEQ analysis method allows to identify the classes of meaning, namely on the basis of the most meaningful words, that represent the dominant ideas and themes of the body of data. The software also employs the Reinert method (Fig. 1), which allows to realise a classification of terms; more specifically, it runs a factorial correspondence analysis that deconstructs the original text and reorganises it based on word repetition and sequence.

In our case, the method resulted in four classes that correspond to the four variables used in this research: Class 1 corresponds to the variable riad guest house; class 2 to the variable hotel; class 3 to the variable restaurant; and class 4 to the variable rural guest house. For each class, the software generated a lexical summary in order to detect variations around the richness of the vocabulary used in that class.

Class 4 (rural guest houses), comprising 22.6% of the forms, is the main branch of the dendrogram (diagram of Fig. 1). The three remaining classes in the second branch are divided into two branches: Class 1 (riad guest houses); class 3 (restaurants), with 51.2% of the forms; and class 2 (hotels), with 26.3% of the forms. This classification into three branches shows the existence of three different lexical worlds.

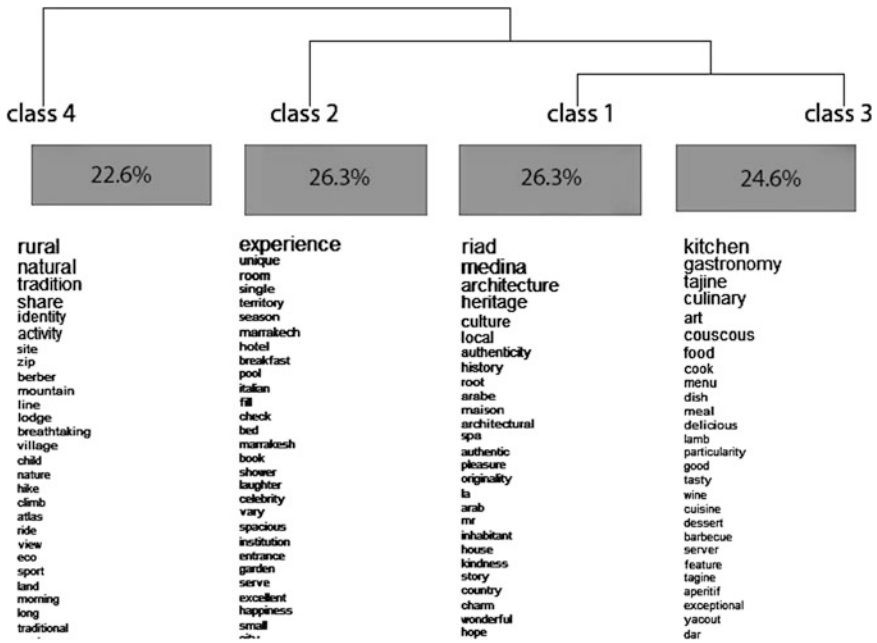

Fig. 1 Representation of classes of the TripAdvisor reviews using the Reinert method (*Source* IRAMUTEQ)

To illustrate how these three lexical worlds are distributed, Fig. 2 shows how these values are distributed along the x-axis and the y-axis.

On the x-axis, representing 40.19% of the body of data, class 4 (negative x-axis) is clearly separate from classes 1 and 3 (positive x-axis), with class 2 being is centred.

On the y-axis, representing 31.06% of the body of data, class 1 (positive y-axis) is clearly separate from classes 2 and 3 (negative y-axis), while class 4 is more centred.

The combination of these two axes offers a two-dimensional view of the text corpus, and distinguishes three zones: Firstly, a zone of positive x-axes and negative y-axes, on the bottom right, showing class 1 corresponding to the variable riad guest house; A central area consumed mainly by class 4 (rural guest houses), with negative x-axes and y-axes, half positive and negative; finally, a zone of positive and slightly negative coordinates, on the top right, showing class 2 (hotels) and class 3 (restaurants). These two classes appear, as expected, intertwined since they correspond to the same lexical world.

The positioning of each class in Fig. 3 allows for a quick visualisation of the results.

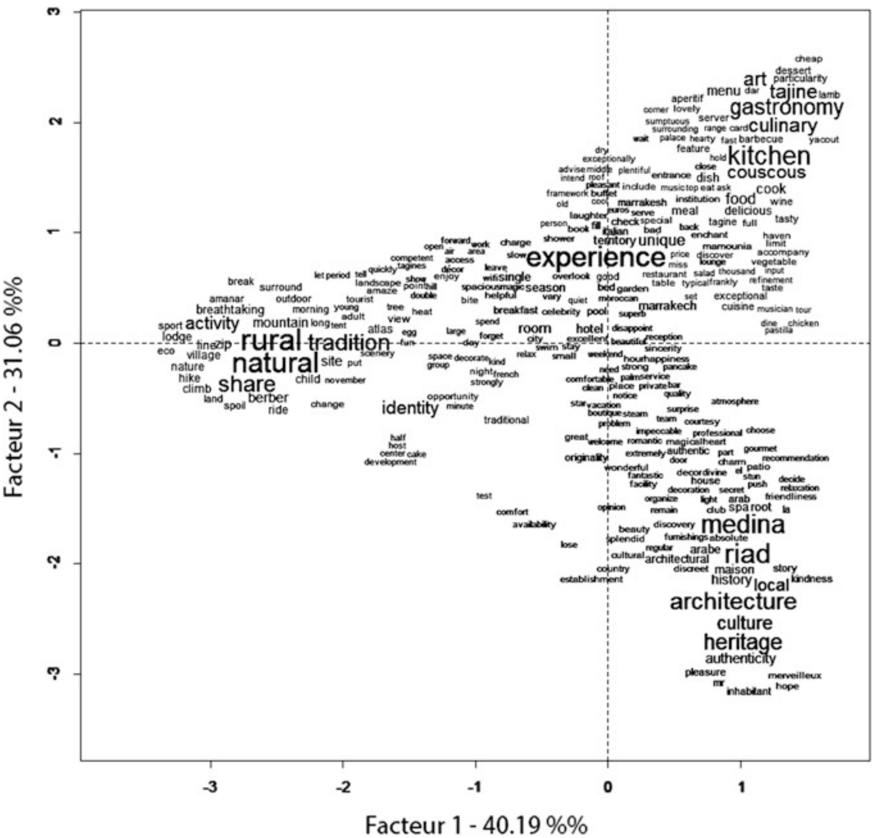

Fig. 2 Factorial correspondence analysis of the enlarged body of data (words and classes) (*Source* IRAMUTEQ)

The results presented in Figs. 1, 2 and 3 may be interpreted as follows: Class 1 (riads) presents active forms that refer primarily to medina (An Arabic term designating the old part of a town) and highlights the entire lexical field around culture and heritage. The word *architecture* is also very present in the reviews of tourists. Other words that appear in this first class, such as *authenticity*, *local* and *history*, readily conjure associations with *originality*, which constitutes one dimension of authenticity.

The following are examples of typical reviews on riad guest houses:

> The riad is sumptuous, the decor is authentic, and the rooftop terraces where you can have breakfast, lunch and dinner offer a magnificent view of Marrakech.

> Very well located riad. Lots of charm and a beautiful authentic and traditional architecture in the heart of the medina.

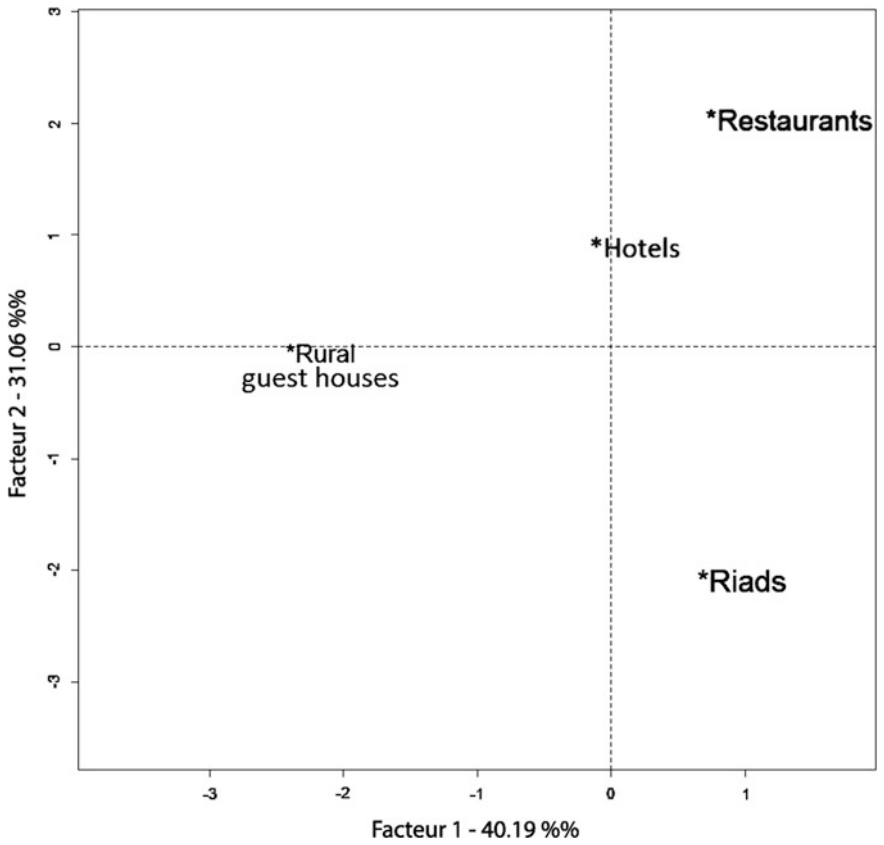

Fig. 3 Factorial correspondence analysis of the variables of the TripAdvisor reviews (*Source* IRAMUTEQ)

The main active forms presented by class 2 (hotels) are *experience, unique* and *Marrakech*. This textual composition demonstrates a link with another dimension of authenticity, that of *singularity*.

The following are some examples of hotel reviews:

> The setting of the hotel is truly unique and authentic, both with regard to the greenery and the architecture!
>
> An authentic and singular haven of peace… we spent a wonderful and sunny week here in April. The gardens are magnificent and the city is a veritable showcase of historical monuments.

The words evoked for class 3 (restaurants), revolving around the theme of gastronomy, were *Couscous* (Moroccan traditional dish), *cooking* and *culinary art*. This lexical world obviously refers to the dimension *singularity*, which is confirmed by the rapprochement between class 2 and class 3 in the representation of Fig. 2.

The following are examples of reviews of restaurants.

> I can highly recommend having an authentic Moroccan meal. Couscous with lamb, a true delicacy, the cuisine is sophisticated… excellent Moroccan flavours.

> Great authentic place, beautiful setting and exceptional cuisine… We also liked the tea on the terrace with a splendid view of the Koutoubia Mosque.

Class 4 (rural guest houses) is relatively isolated from the other classes (Fig. 2). The main active forms of this class are: *rural*, *natural*, *sharing* and *identity*. This textual composition very much approximates the element *projection and identity*.

The following are some examples of reviews on rural guest houses:

> Authentic and inspiring walk in the mountains, typical beautiful scenery… Very pleasant and remote while being within reasonable distance from Marrakech. In short, a return to the source!

> A beautiful setting for resting and relaxing with a good meal and an intimate, absolutely stunning night view that allowed us to discover the authentic marrakech from another angle.

4.2 *Discussion: Authenticity as a Set of Components that Feed on Each Other*

Illustrated in the form of a triangle (Fig. 4), the factorial analysis of the variables of the collection of reviews shows the existence of three separate lexical worlds. These correspond to three commonly accepted notions of authenticity found in the literature, being originality, singularity and identity.

The analysis also shows how the meaning of authenticity shifts continuously, albeit confined to one lexical corpus, suggesting that the term has a chameleon-type characteristic in that it adapts to the type of establishment in question in the review.

By being organized in a triangle, the three semantic worlds originality, singularity and identity do not mutually exclude each other. Instead, they feed on the shifting borders just as they feed, in a transitive manner, on the affective, cognitive and symbolic dimensions emanating from or attributed to objects and experiences of the trip. This transitivity moves in a circular manner between the three lexical

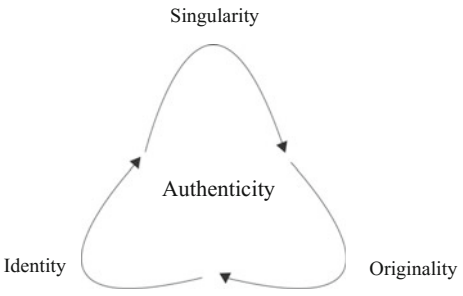

Fig. 4 Authenticity as dynamic and triangular set of characteristics

worlds. For example, an original character could contribute to the product a feature of singularity or an exceptional trait. This is the case with products to which one feels attached because they remind us of certain stages of our history (Cova and Cova, 2001).

The following review from a tourist of a rural guesthouse illustrates how the characteristics of the environment and the original context of the hosting structure inspire to a projection of the self.

> A beautiful and inspiring walk on the mountain that is typical with its beautiful scenery… original and authentic architecture made of rammed earth, isolated while being within a reasonable distance from Marrakech. Simply put, a return to the source. Here I can find myself.

5 Conclusion

The questioning of the notion of authenticity seems to be timely. Indeed, the quest for authenticity is a salient feature of the current tourism demand, as targeted by marketing research studies. The words *authentic* or *authenticity* function as a selling point, meeting the expectations of Western tourists in search of roots. In that context, the term *authenticity* is increasingly used by tourism operators as a catch-all. Subsequently, over used, the term tends to fuel ambiguity.

It is now understood that this ambiguity is due to the internal polysemy of the term *authenticity* as well as the semantic richness of its lexical and syntactic usage. This explains the difficult bridge to gap between semantic diversity on the one hand and social mimetism on the other. However, as indicated by Babadzan (2001), the globalization of the need for authentic local features would merely be yet another paradox of current-day globalization. As we have shown, the use of the term *authenticity*, semantically rich, prompts to further reflection on its use in order to improve its relevance and ensure that it confers the appropriate meaning to the objects and experiences presented in the promotional discourse of tourism professionals.

This work paves the way for further exploratory studies on the concept of authenticity in the context of tourism destinations and tourist experiences. A number of endogenous and exogenous criteria for authenticity have yet to be clearly defined. Future research could allow to deepen our knowledge on the cognitive and psychological dimensions of travellers in search for authentic experiences. The cognitive dimension refers to beliefs and knowledge about a destination, while the affective dimension refers to the emotions experienced around a destination.

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How "Bad" Are You? Justification and Normalisation of Online Deviant Customer Behaviour

Marianna Sigala

Abstract The study investigates online Deviant Customer Behaviour (DCB). Multidisciplinary research on neutralisation techniques justifying DCB was reviewed and expanded for considering the Internet context. Data collected from a convenience sample revealed four clusters of people exhibiting distinct behaviour engagement patterns of online DCB that they do not perceive them as 'wrong'. Respondents did not claim to be 'bad online users' despite their engagement in online DCB. Instead of the number and level of engagement in online DCB, it was the level of perceived wrongness of online DCB that was found to statistically significantly relate to the respondents' self-assessment level of being a 'bad online user'. Findings about respondents' perceptions of various neutralisation techniques revealed that respondents use different neutralisation techniques for justifying and adopting different online DCB. Findings provide useful implications for developing tailored deterrence management strategies for addressing the neutralisation techniques enforcing the enactment of different online DCB.

Keywords Deviant customer behaviour · Fake reviews · Normalisation · Justification · Neutralisation techniques

1 Introduction

Consumers increasingly adopt online behaviours that are fake or do not exactly reflect the reality (e.g. sharing inaccurate reviews, posting selfies/updates that do not represent reality) (Munzel, 2016; Luca & Zervas, 2016). Recent studies have shown that self-promotion and construction of self-identity are the major social and psychological motives driving customers to engage in online behaviours (Dinhopl & Gretzel, 2016; Marshall, Lefringhausen, & Ferenczi, 2015). However, projecting

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fake and/or unacceptable (legally/ethically) behaviours can put self-identity and self-representation in great risk, specifically online since the Internet has a mass and international exposure. So, what are the processes and factors that make travellers adopt and expose deviant online behaviours that are against their interests to maintain a positive and truthful self-concept? Research defines customer behaviours that are illegal or violate the generally accepted norms of conduct as deviant customer behaviour (DCB) (Fullerton & Punj, 2004). Multidisciplinary findings show that by adopting neutralization techniques, people maintain and even escalate DCB (Bandura, 1991; Bonner & O'Higgins, 2010; Harris & Dumas, 2009). Neutralization techniques allow people to disengage themselves from the consequences of their actions and so, to engage in behaviours originally considered as unacceptable without much distress and thinking badly of themselves (Bandura, 1999; Mazar, Amir, & Ariely, 2008). Thus, neutralization techniques are disengagement tools enabling people to justify and regard behaviours that are considered as deviant by external measures as acceptable and in accordance to their own underlining values and beliefs.

However, although neutralization is heavily studied in offline contexts (Dootson, Johnston, Beatson, & Lings, 2016), research has failed to investigate its relevance in online environments whereby DCB takes different forms and occurs under different conditions (i.e. anonymity, international scale, cyber legislation, netiquette, difficulty of policing/punishing DCB). Investigation of online DCB is also required, because the neutralization techniques and the factors that people use to justify DCB differ based on the type and features of DCB (Dootson, Johnston, Beatson, & Lings, 2016). This also implies that by understanding the neutralization processes used for each type of online DCB, firms would be able to develop tailored deterrence strategies that challenge the specific people's justifications enabling the enactment of different online DCB. Hence, as firms cannot adopt a 'copy-paste' and a 'one-size-fits-all' strategy for deterring the various new types of online DCB, research is urgently required to better understand the people's processes and factors enabling them to justify and adopt online DCB. This is also imperative, as Internet research focuses on software detecting online DCB (Luca & Zervas, 2016) ignoring its drivers and prevention. Research on online DCB is also required, because of its increasing scale and detrimental effects on firms' assets, employees and other customers.

This paper explores the neutralization techniques used by travellers for justifying and adopting various forms of online DCB without having to perceive themselves as badly. The neutralization techniques used in offline settings are reviewed and then expanded for considering the Internet context. Twelve popular online DCB were used for investigating their perceived levels of wrongness and the processes that people use for neutralizing and adopting them. The researcher's peer network was used for collecting reliable/authentic data about sensitive and private issues. People were asked to report: the extent to which they perceive each online DCB as wrong; their perceptions towards various neutralization techniques; their engagement frequency in twelve online DCB activities; and their self-assessment about the extent to which they perceive themselves to be 'bad online users'. The findings provide useful implications for: understanding people's adoption of online DCB;

segmenting customers based on their engagement, use of neutralization processes and perception of wrongness of various online DCB activities; and developing deterrence strategies for each type of DCB.

2 Online Deviant Behaviour in Tourism

Customer behaviours that are illegal or violate the generally accepted norms of conduct are heavily studied and referred to as deviant customer behaviour (DCB) harming firms' assets, employees and other customers (Fullerton & Punj, 2004). Similarly, online DCB can be defined as any online customer behaviour that is against the law, organizational policy and/or social norm that can harm the firm, the employees and/or other online users. Nowadays, customers engage in various positive and negative valenced behaviours through social media (Dolan, Conduit, & Fahy, 2016) e.g. dislike, online reviews, blogs boycotting a firm/product. Although there is anecdotal evidence that such online customer behaviour can also be falsehood and deviant, it is only during the last years, that more and more studies provide evidence and theoretical understanding that people share UGC and adopt online DCB that do not reflect the reality, because of the following social, psychological and functional reasons.

As a new medium for self-expression and self-representation, taking and sharing a selfie on social media is widely adopted as a mode of: self-representation; online identity construction; communication; and appease of the crowd. However, people share selfies that reflect something 'better' or socially 'ideal' to gain the others' attentions and admiration, and to maintain an inflated self-view (Qiu, Lu, Yang, Qu, & Zhu, 2015; Weiser, 2015; Sorokowski et al., 2015). Narcissism and impression management are found as major drivers of posting fake selfies (Sorokowski et al., 2015). Tourism is not an exception of this phenomenon, as selfie-taking and sharing is driven by othering and it is a process of producing/consuming visual culture of the self (Dinholp & Gretzel, 2016). So, the tourists' journeys and experiences are lived in order to be photographed within the eyes and scrutiny of others. Research has shown that people change their behaviour when they are, or they believe that they are, under the scrutiny of others. Thus, selfies are shared for creating an appealing and socially accepted self-image to a specific audience (Magasic, 2016). People also post content on Facebook timelines for self-promotion and generating envy to others (Taylor, Taylor, Strutton, & Strutton, 2016). Hence, people share fake UGC on Facebook for creating conspicuous consumption and constructing an inflated self-image. People also adopt socially 'appropriate' online behaviours for avoiding ostracism and being accepted by their online peers (Marshall, Lefringhausen, & Ferenczi, 2015).

Online fake reviews is another common tourism example of online DCB (Yoo & Gretzel, 2009; Luca, 2011; Munzel, 2016; Jin & Leslie, 2009; Schuckert, Liu, & Law, 2016). Both industry and consumers are increasingly becoming aware of potentially deceptive online reviews (Munzel, 2016; Luca & Zervas, 2016; Chen,

Zhou, & Chiu, 2015). 'Paid' reviewers and bogus reviews are found in tourism, as several firms 'lobby' travellers to write fake positive reviews by giving them discounts, special offers and/or treatments (O'Connor, 2010). Research about online reviews in tourism has mainly focused on examining their impact on travellers' decision making, firms'/destinations' reputation/image, online sales and price competitiveness (e.g. Filieri, Alguezaui, & McLeay, 2015; Liu, Pennington-Gray, Donohoe, & Omodior, 2015; Banerjee & Chua, 2016; Schuckert, Liu, & Law, 2015; Kim, Watson, & Kirmani, 2015). Very few studies have explored the motivations to post reviews and the content of reviews (i.e. studies conducting opinion mining of online reviews) (Schuckert, Liu, & Law, 2015), while research has totally ignored to study the phenomenon of online fake travel reviews.

Despite the importance and increasing scale of online DCB, there is still a small but rising literature investigating the quality and authenticity of UGC and online customer engagement behaviours (Luca & Zervas, 2016). Though, all studies focusing on reviews' fraud aim to develop algorithms and methodologies that can detect fake reviews (e.g. Akoglu, Chandy, & Faloutsos, 2013). Very few studies explore online fake reviews from a management approach (Luca & Zervas, 2016). For example, Luca and Zervas (2016) and Mayzlin et al. (2012, 2014) have examined the type of firms (independent versus chain hotels and restaurants) and the contextual factors (competition, amount and quality of existing online reviews) influencing them to post fake reviews about their properties and their competitors. No research examines the travellers' engagement in review fraud (positive and/or negative).

3 Neutralisation Process and Factors Influencing (Online) DCB

Individuals have an inherent drive to maintain a positive self-concept (Blasi, 1984; Cialdini, 1988; Mazar, Amir, & Ariely, 2008). Hence, individuals engage in activities that they perceive as good, because if they were to engage in behaviour that is beyond the level of 'wrongness' that they can tolerate, then they would need to negatively update how they perceive themselves, i.e. to think badly of themselves. The performance of DCB is enabled by neutralisation techniques that distort the link between the people's actions and the consequences they cause (Bandura, 1991; Mazar, Amir, & Ariely, 2008). By disengaging themselves from the consequences of their actions, people can justify and adopt behaviours that they have originally consider as unacceptable, without much distress. The following neutralization techniques are found to be used in consumer contexts (Dootson, Johnston, Beatson, & Lings, 2016):

- *denial of responsibility*: people disengage themselves from their actions by deflecting responsibility for the outcome of their behaviour to the external environment (Sykes & Matza, 1957).

- *denial of injury*: used when the individual perceives that his behaviour is not harming others, specifically when the victims are not socially close to him (Sykes & Matza, 1957).
- *relative acceptability technique or justification by comparison*: used when people argue that there are *'much worse individuals than me'* (Daunt & Harris, 2011; Cromwell & Thurman, 2003).
- *denial of victim*: people recognize their responsibility and injury caused, but they justify their actions and consequences as "*a rightful retaliation or punishment*" (Sykes & Matza, 1957: 668).
- *condemnation of the condemners*: neutralization of a DCB by shifting attention to those condemning the individual's behavior (Sykes & Matza, 1957). People justify their DCB by attacking the wrongfulness of the others' behaviours to deflect from their own questionable behaviours, e.g. unfair to condemn one person, without condemning all the individuals who engaged in similar actions (Coleman, 1994).
- *appeal to higher loyalties*: a technique justifying upholding a norm of a small sub-group of society at the cost of violating a wider societal norm (Sykes & Matza, 1957).
- *claim of entitlement*: a neutralization technique used to justify benefit from enacting a DCB (Coleman, 1994; McGregor, 2008).
- *normal practice*: a technique that rationalises a behaviour as acceptable if it is prevalent in society, i.e. *'everybody else is doing it'* (Coleman, 1994; Henry, 1990).
- *metaphor of ledger*: a neutralization technique making some behaviours to be perceived as good, by making comparisons between different behaviours the individual performs (Klockers, 1974).

It is hypothesized that the above neutralization techniques are also used for justifying online DCB. However, the Internet is characterized by some special features (i.e. anonymity, lack or inadequate cyber legislation, difficulty of policing and punishing DCB) that further enable people to justify and adopt online DCB. Specifically, in accordance to the impact of laws on neutralization techniques (Dootson, Johnston, Beatson, & Lings, 2016), it can be assumed that the following issues can enable people to disengage themselves from online DCB and their consequences: the lack of specific cyber legislation for defining and punishing online DCB; people's unawareness of such legislation; inability to police and detect online DCB; users' ability to hide their identity online by using anonymous or fake profiles.

Research has also found that a major factor influencing the type of neutralization technique that people select to use for justifying their perceptions of 'wrongness' of various types of DCB is the intent of the act (i.e. the passive or active intention of the consumer performing the act) (Daunt & Harris, 2011). In general, in relation to active DCB, passive acts are perceived to be more acceptable. For example, active DCB (e.g. giving misleading information) is perceived more wrong than a passively deviant act (e.g. not saying anything when receiving extra change). Research also

shows that consumers vary in their perceptions of the ethicality (Neale & Fullerton, 2010) and wrongness (Wilkes, 1978) of different consumer behaviours, because of their personality, culture and other demographic variables.

4 Methodology

The study aimed to explore the neutralization techniques used by travellers for justifying and adopting various forms of online DCB. Discussions with four tourism professionals and three academic peers were undertaken for using their experience, knowledge and perceptions, to identify the most popular online DCB that travellers adopt. Discussions revealed that four major online DCB are perceived to be the most popular and critical to tourism: false online accounts/profiles; provision of false personal data; false or inaccurate UGC; false checks-in; participation in online dialogues supporting false/inaccurate UGC. These online DCB were then re-worded into twelve online DCB (Table 1) reflecting: positive and active DCB (Daunt & Harris, 2011) (i.e. sharing versus not sharing, reacting versus not reacting, check-in versus not check-in); and positive and negative valenced online customer engagement (Dolan, Conduit, & Fahy, 2016) (e.g. share positive versus negative experiences). The neutralization techniques summarized by Dootson, Johnston, Beatson, and Lings, (2016) were used for identifying specific items that travellers can use for neutralizing their online DCB and justifying their adoption.

The researchers' peer and friends' networks were used for distributing a questionnaire inquiring people about: the extent to which they perceive each online DCB as wrong; their level of agreement to various items reflecting neutralization techniques that they may use for justifying every online DCB; their frequency of engagement in the twelve online DCB activities; and their self-assessment about the extent to which they perceive themselves to be 'bad online users'. The researcher's peer network was used for collecting reliable and authentic responses, as the researchers' social proximity and personal connection with this convenience sample was believed to increase the likelihood that people would respond to personal and private questions in a reliable and honest way. The research instrument was pilot tested with seven peers for testing its comprehensiveness. Some minor rewording corrections were conducted for enhancing readability. The online survey was sent to 450 people that claimed to use social media for travel purposes and 137 usable responses were collected.

5 Discussion and Implications of the Findings

Respondents represent a good mix of genders (53% = female) and age groups (>18 years = 2%, 19–30 years = 34%, 31–50 years = 37%, <50 years = 27%). A cluster analysis (Ward's method) was used for clustering respondents according

Table 1 Clusters of respondents based on their engagement level in online DCB

Engagement frequency: 7 point Likert scale: 0 = never 6 = always	Cluster 1: (21%)	Cluster 2: (37%)	Cluster 3: (23%)	Cluster 4: (19%)	F (ANOVA)
Perceived level of being "bad online user": 7 point Likert scale: 1 = not bad at all, 7 = very bad	1.91/1.02	2.04/1.27	2.14/1.13	2.56/1.03	0.0276
1. Creating a fake account/profile on social media	4.01/1.14	2.01/1.16	1.98/1.32	2.03/1.08	10.561[a]
2. Providing false profile details (e.g. name, e-mail, age, gender etc.) when registering for online services	4.11/1.09	2.09/1.18	1.88/1.21	2.11/1.11	9.924[a]
3. Not correcting personal profile data online, when realizing that they are inaccurate or false	4.02/1.01	3.03/1.21	2.28/1.18	2.02/1.23	11.916[a]
4. Sharing content (e.g. reviews, comments, photos, videos, selfies, status updates etc.) online that is better than your experienced reality	3.03/1.13	2.45/1.25	4.37/1.28	3.11/1.28	8.033[a]
5. Sharing content (e.g. reviews, comments, photos, videos, selfies, status updates etc.) online that is worse than your experienced reality	2.84/1.26	2.02/1.32	3.02/1.16	4.37/1.02	10.831[a]
6. Sharing content (e.g. reviews, comments, photos, videos, selfies, status updates etc.) online that you have not experienced	2.04/1.03	2.59/1.12	3.97/1.02	4.56/1.21	14.218[a]
7. Not sharing content (e.g. reviews, comments, photos, videos, selfies, status updates etc.) online that you have experienced	2.012/1.25	4.023/1.11	1.98/1.13	2.01/1.23	12.218[a]
8. "Checking-in" in locations and/or organizations that you have never been	2.11/1.13	2.03/1.03	4.03/1.01	3.03/1.25	11.284[a]
9. Not "checking-in" in locations and/or organizations that you have been	1.96/1.19	4.11/1.09	2.01/1.17	2.17/1.26	13.032[a]
10. Not reacting (e.g. like, sharing, commenting) to online content that you know it is true for reinforcing its accuracy	1.75/1.28	4.24/1.15	2.37/1.32	2.41/1.03	14.283[a]
11. Not reacting (e.g. like, sharing, commenting) to online content that you know it is false for correcting its accuracy	1.83/1.16	4.08/1.17	2.03/1.12	2.11/1.02	15.024[a]

(continued)

Table 1 (continued)

Engagement frequency: 7 point Likert scale: 0 = never 6 = always	Cluster 1: (21%)	Cluster 2: (37%)	Cluster 3: (23%)	Cluster 4: (19%)	F (ANOVA)
12. Reacting (e.g. like, sharing, commenting) to online content that you know that is false for strengthening its impact	2.03/1.14	2.53/1.18	2.32/1.11	4.01/1.01	12.372[a]

Mean/standard deviation, [a]$p < 0.001$

to their engagement level on the twelve online DCB. A four cluster solution (Table 1) yielded the clearest distinctions amongst clusters and provided more meaningful insights for the different engagement patterns on online DCB, as significant differences were found amongst the clusters for all the types of online DCB. The majority of respondents (37%, passive deviators) admitted to not to be engaged in online DCB that may generally appear fake/false. This is not surprising as it is generally easier for someone to admit not doing something rather than admit doing something (Daunt & Harris, 2011). A great majority of respondents (23%, active profile builders) claimed to undertake online DCB that can help them build a positive and better self-identity, 21% (the anonymous seekers) reported to mainly be engaged in online DCB that protect their online anonymity and 19% (the active retaliators) claimed to mainly engage in online DCB that mainly represent fake/false negative valenced online acts. In other words, the four clusters tend to focus on specific types (passive versus active and positive versus negative) of online deviant activities that in some way reflect the motives of their actors.

ANOVA tests revealed that there are no statistically significant differences amongst the four clusters in terms of their perceived level of being 'bad online users'. Hence, clusters differed in their engagement patterns of online DCB, but they did not significantly differ in their perceived levels of 'being bad online users'. In other words, despite declaring engagement in online DCB, respondents from all clusters did not perceive themselves as doing something wrong irrespective of the type of online DCB that they were engaged with. Multiple regression was used for examining whether the level of self-assessment of respondents of being 'bad online users' is related with: the number of online DCB activities that the respondents were engaged with; the number of online DCB that every respondent engaged with; the total score of engagement level in online DCB; and the total score of wrongness of all the online DCB in which the respondent is engaged with. Level of engagement that was reported as zero did not add up in the total 'number of online DCB' per respondent and it also resulted in zero score of wrongness and zero score of engagement level. The estimation model controlling for respondents' age and gender is given below:

$$\text{Self} - \text{assessment of being ``bad online user''} = \text{constant} + \beta_a \times \text{Age} + \beta_b \times \text{Gender} + \beta_c \times \text{Number of online DCB engaged with} + \beta_d \times \text{Score of engagement level in online DCB} + \beta_e \times \text{Score of wrongness}$$

Score of engagement level = (Level of engagement in online DCB_1 + … + Level of engagement in online DCB_{12}).

Score of wrongness = (Level of wrongness of online DCB_1 × engagement level on the online DCB_1 + … + Level of wrongness of online DCB_{12} × engagement level on the online DCB_{12}).

Findings revealed that the number of online DCB that respondents were engaged with and the 'score of engagement level' did not significantly ($p < 0.0001$) relate to the respondents' perceived level of being 'bad online users', while there was a statistically significant relation between the level of 'bad online user' and 'score of wrongness' ($\beta = 0.3267$, $p < 0.001$). This means that respondents reporting higher level of engagement and engagement in more online DCB did not report statistically higher/lower levels of self-assessment of being bad online users. On the contrary, the level of engagement in the online DCB in combination to the perceived level of wrongness of this online DCB was significantly related to the respondents' self-assessment of being a bad online user. In other words, the number of online deviant activities in which the respondents are engaged with does not relate to their level of badness; on the contrary, it is the respondents' perception about the level of wrongness of the online DCB that made them perceive themselves as bad online users. The less wrong the online DCB was perceived, the less bad respondents felt about themselves, even if they may have reported to be frequently engaged in such online DCB; and vice versa, the more wrong the online DCB is perceived, the more bad respondents felt about themselves irrespective of their level of engagement in this activity. This finding clearly shows that people's perceptions about themselves are not influenced by their level of engagement in online DCB, but by their perceptions of the wrongness or not of such activities. Hence, this finding confirms the existence and use of neutralisation techniques for justifying and adopting online DCB. Because of that, investigating the neutralisation processes that can make people perceive an online act as deviant or wrong is of critical importance, because neutralisation techniques can be used as predictors of online DCB.

So, the respondents' perceptions about the neutralisation techniques were investigated in order to examine what makes them set different levels of perceived wrongness to online DCB. The findings (Table 2) revealed that the respondents used almost all the various neutralisation techniques (as the mean scores of all items are higher than the mid point = 3.5). The respondents' recognition of all neutralisation techniques also explains why the respondents also reported significantly high engagement levels of online DCB, as the former enabled them to adopt online DCB without having to perceive themselves as 'bad'.

Moreover, as it was expected based on past studies (Daunt & Harris, 2011), it was also found that the use of neutralization techniques differed depending on the

Table 2 Neutralisation techniques

Neutralisation technique	Item: indicate your degree of agreement with the following statements: *Likert: 1 = totally disagree 7 = totally agree*	Cluster 1	Cluster 2	Cluster 3	Cluster 4	F (ANOVA)
Denial of responsibility	This is the only way I can go through online processes (e.g. registration) fast and easy	5.03/1.24	4.14/1.12	4.04/1.28	3.98/1.32	14.047[a]
	I have no other choice for addressing unacceptable firms' behavior (e.g. bad service, compulsory collection of personal data in order to use a web service)	4.27/1.27	3.94/1.26	4.01/1.27	5.19/1.31	13.139[a]
Claim of entitlement	This activity builds my online social identity	4.02/1.02	4.13/1.24	5.82/1.09	4.11/1.15	14.182[a]
	By doing this, I get benefits from firms (e.g. loyalty points, discounts, preferential treatment)	5.01/1.02	4.07/1.04	4.52/1.09	4.37/1.03	
Denial of injury	My friends are not affected by doing this activity	3.94/1.23	4.11/1.14	3.87/1.12	4.49/1.08	
	There is no likelihood that this action will harm anyone	4.11/1.24	5.08/1.04	4.02/1.12	4.11/1.12	12.862[a]
	This activity causes minimal harm to online users	4.26/1.13	4.42/1.34	4.52/1.14	5.06/1.13	

(continued)

Table 2 (continued)

Neutralisation technique	Item: indicate your degree of agreement with the following statements: *Likert: 1 = totally disagree 7 = totally agree*	Cluster 1	Cluster 2	Cluster 3	Cluster 4	F (ANOVA)
Relative accept.	Online users behave even worse than this online activity	4.03/1.04	4.78/1.16	4.45/1.44	4.22/1.09	
Ledger metaphor	I do legal activities online, so I can do this activity	3.94/1.11	4.04/1.34	4.62/1.03	4.38/1.02	
Denial of victim	By doing this, I can protect my privacy online	5.35/1.03	4.02/1.07	4.24/1.14	4.12/1.03	14.623[a]
	By doing this, I can punish firms with unacceptable behavior (e.g. bad service, compulsory collection of personal data in order to use a web service)	4.05/1.12	4.25/1.13	4.09/1.24	5.09/1.12	13.273[a]
	This activity maintains my self-esteem online	4.12/1.14	4.08/1.14	5.12/1.23	4.06/1.14	15.824[a]
	By doing this, I avoid the risk of online ostracism	4.12/1.11	4.66/1.06	4.23/1.21	4.02/1.39	
Condemnation of the condemn.	Others doing this are not perceived as wrong, so I am not wrong as well	4.31/1.09	5.02/1.19	4.51/1.02	4.22/1.21	

(continued)

Table 2 (continued)

Neutralisation technique	Item: indicate your degree of agreement with the following statements: *Likert: 1 = totally disagree 7 = totally agree*	Cluster 1	Cluster 2	Cluster 3	Cluster 4	F (ANOVA)
Normal practice	This is what everyone does online	4.08/1.23	4.05/1.11	5.19/1.04	4.19/1.14	13.945[a]
	My online friends are engaged in such online activity	4.12/1.03	4.17/1.03	5.15/1.03	4.25/1.02	14.026[a]
	There is no social sanction punishing this activity	4.12/1.03	4.05/1.02	4.11/1.02	4.29/1.11	
Appeal to higher loyalties	I do this for showing to others the bugs of the system	4.07/1.11	4.12/1.15	4.23/1.22	4.43/1.06	
	By doing this, I prove that something is wrong	4.17/1.33	4.14/1.21	4.02/1.05	5.24/1.01	15.025[a]
The 'risk' free online environment	This activity is not illegal by legislation	4.13/1.01	4.15/1.02	5.31/1.22	4.09/1.10	16.015[a]
	There is no legal sanction for doing this activity	5.12/1.03	5.17/1.12	4.27/1.02	4.52/1.02	
	Nobody knows that it is me doing this activity	4.23/1.11	5.17/1.14	4.28/1.03	4.47/1.13	
	It is impossible to be identified for doing this activity	5.07/1.13	4.15/1.13	4.34/1.22	4.23/1.06	

Mean/standard deviation, [a]$p < 0.001$

type of the online DCB (i.e. active versus passive); specifically, ANOVA tests revealed some statistically significant differences amongst respondents of the four clusters in terms of their perceptions about certain neutralization techniques.

In relation to other clusters, respondents from cluster 1 (i.e. respondents adopting DCB because they seek to remain anonymous) seemed to agree more with the neutralisation technique that there is no other option to go through online processes easily and fast. In this vein, in order to effectively deter people from providing false online profiles for keeping their anonymity, firms have to change and make their online processes more user friendly, less time/effort demanding and more secure, while also reconfirm to the users about the integrity and robustness of the process to collect, store and use personal data in a secure and legal way.

Respondents from cluster 2 (the passive deviators) statistically significantly agreed more than others that their online DCB does not affect others. Because of this, an effective deterrent strategy for stopping people to justify their passive online deviant behaviour (e.g. not providing authentic UGC and/or not reacting to false UGC) is to use, communicate and share examples showing how passive activities can harm other citizens, the firms and the society overall. As theory says, people's ignorance of the potential harm of their activities makes them think of these activities as not wrong. Thus, increasing awareness and people's 'education' about the potential impacts of passive DCB can be an effective strategy to demotivate people from adopting passive DCB. Moreover, as the social distance between people can make someone more sensitive about the impacts of his/her behaviour towards the others, the use of examples for showing to people the potential damage of their behaviours can be personalized to their friends and/or themselves in order to make them more effective in demotivating the adoption of DCB.

In relation to others, respondents from the cluster titled 'profile builders' more significantly agree that their activities support the construction of their self-esteem and social identity, as well as that everyone else behaves like this and that their activity is not illegal. Thus, it seems that the people's perceptions about the general adoption of this activity resulted in the normalization of this activity, which in turn contributed to its consideration as a not wrong activity and so, its justified adoption as a socially accepted act. In this vein, in order to address this DCB, firms need to adopt practices that will aim to change people's perceptions about the wide adoption of such practices, while at the same time, they would need to find ways to reformate the general consensus of such wide social practices and re-normalize such online DCB as not socially acceptable. To that end, the legislation of appropriate rules making such DCB illegal can be used for speeding up the re-formation of social rules and norms.

Finally, respondents from the cluster representing the retaliators seem to agree more than others that their DCB are conducted because such acts are perceived as a way to retaliate and/or identify a problem. So, to deter such DCB, firms would need to act proactively by identifying the processes and the factors that create such 'problems (e.g. low levels of services, customer complaints) and by adopting procedures that rectify and address such problems.

Overall, the findings also reveal that the respondents did not only report their agreement and recognition of neutralization techniques referring to the Internet context (i.e. items related to the factor "*The 'risk' free online environment*" such as anonymity and lack of cyber legislation). On the contrary, the respondents declared their recognition of a whole variety of neutralization techniques. This finding show that the justification and adoption of online DCB is not a technological and/or legal problem (i.e. a problem created due to the inefficiencies of technologies to track and monitor people's online behaviours and of legislation to make such behaviour illegal and penalize them). Instead, the adoption of online DCB is also a social problem and phenomenon driven by social norms and people's perceptions and psychological processes. To that end, the effective deterrence of online DCB requires the adoption of a wide variety of measures including legal, technological but also social methods such as people's 'education' and the re-formation of existing perceptions and the re-institutionalization of social norms and routines that identify and characterize online DCB as 'wrong' behaviours. This also means that the deterrence of online DCB should be viewed from a collectivism—society but also individual perspective.

6 Conclusion

Despite the increase of online DCB, no research has examined its occurrence. Findings reveal that people use neutralization techniques to justify and adopt online deviant behaviours without having to perceive themselves as bad. Findings collected from a convenience sample revealed that instead of one size fits all, customized neutralization deterrence strategies are required to deter online DVC that are justified and adopted for different reasons. Findings also revealed that the occurrence of online DCB is not only a technological and/or legal problem, but also a social problem. To that end, the study identified and proposed various deterrence strategies that refer to technological, legal and social measures.

However, as findings come from a convenience sample, larger scale research collecting data from different nationalities and cultures is required in order to further refine and test the findings. Moreover, as past research has found that people with different personalities and demographic characteristics also adopt different neutralization techniques, future research should also investigate the impact of such people's variables on their engagement of online DCB as well as the development of personalized deterrence strategies for eliminating online DCB at an individual level. Finally, research should also further investigate the social processes that need to be adopted for re-formatting social perceptions and norms about the wrongness of online DCB and for re-institutionalization and routinize from widely adopted and so, socially accepted practices to wrong acts and anti-social behaviours.

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Part IX
Social Media

Assessing Reliability of Social Media Data: Lessons from Mining TripAdvisor Hotel Reviews

Zheng Xiang, Qianzhou Du, Yufeng Ma and Weiguo Fan

Abstract As an emerging research paradigm, big data analytics has been gaining currency in various fields. However, in existing hospitality and tourism literature there is scarcity of discussions on the quality of data which may impact the validity and generalizability of research findings. This study examines the reliability of online hotel reviews in TripAdvisor by developing a text classifier to predict travel purpose (i.e., business versus leisure) based upon review textual contents. The classifier is tested over a range of cities and data sizes to examine its sensitivity to data samples. The findings show that, while the classifier's performance is fairly consistent across different sets of cities, there are variations in response to data sizes and sampling methods. More importantly, a considerable amount of noise is found in the data, which leads to misclassification. Furthermore, a novel approach is developed to address the misclassification problem resulting from data noise. This study reveals important data quality issues and contributes to the theoretical foundations of social media analytics in hospitality and tourism.

Keywords Big data · Online hotel reviews · Social media analytics · Text classification · Machine learning · Methodology

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1 Introduction

Social media analytics, which combines Web crawling, computational linguistics, machine learning and statistical techniques to collect, analyse, and interpret user-generated contents for business purposes, has been gaining currency in a variety of disciplines (Fan & Gordon, 2014; Lazer et al., 2009; Xiang, Schwartz, Gerdes, & Uysal, 2015). Particularly, online consumer reviews have been extensively studied as new sources of data to understand a range of research problems in hospitality and tourism (see Schuckert, Liu, & Law, 2015 for a review). However, in the existing literature there has been little discussion and evaluation of the quality of review data, especially how these data truthfully and reliably reflect the products and consumer experiences, which could limit the validity and generalizability of social media research in hospitality and tourism (Xiang, Du, Ma, & Fan, forthcoming).

In order to understand and address the methodological challenges related to social media data, this study examines the reliability of online hotel reviews using a text classification exercise. Specifically, we developed a text classifier to predict travel purpose (i.e., business versus leisure) based on textual contents of online hotel reviews in TripAdvisor. We evaluated the classifier's sensitivity to different data samples (i.e., data-originating cities and data sizes). During this process we found that there was a considerable amount of noise in the data set, which was likely caused by mislabelling by TripAdvisor users. To address this issue we developed a novel solution to detect misclassifications to improve the performance of the classifier algorithm. This paper reports the analytical process and discusses its contributions to practice and, more importantly, theoretical foundations of social media analytics in hospitality and tourism.

2 Research Background

In recent years there have been growing criticism and concerns about the epistemological challenges in big data analytics especially those using online user-generated contents as research data. There are a range of potential hazards in the processing, analysis, and interpretation of big data such as the fundamental limitations of inductive reasoning (e.g., Frické, 2015) and the practice of making unwarranted claims about causal relationships (instead of mere statistical correlations) (e.g., Ekbia et al., 2015). Ruths and Pfeffer (2014) argue that studies using social media data should be aware of a number of validity problems such as platform biases, data availability biases, and data authenticity issues. Tufekci (2014) specifically highlights the methodological challenges in social media studies, particularly sampling biases arising from using a single platform as data source due to the sociocultural complexity of user behaviour and unrepresentative sampling frames. To address these challenges, researchers have proposed several approaches

to the identification and alleviation of data quality problems in big data research (e.g., Frické, 2015; Ruth & Pfeffer, 2014).

While, parallel to this, there is growing interest in understanding the nature and quality of social media data in hospitality and tourism research (e.g., Chua & Chaterjee, 2013; Park & Nicolau, 2015; Schuckert, Liu, & Law, 2016), systematic assessment of potential biases resulting from the collection, processing, analysis, and interpretation of social media data is lacking. For example, Xiang, Du, Ma, and Fan (forthcoming) examined recent articles published in influential HTM journals and found that most of existing studies utilized only a single source of data usually based upon the popularity of the websites and, in many cases, data quality was merely anecdotal. In a few rare cases involving multiple sources, data were aggregated and then analysed without assessment of the potentially unique contributions from each of these sources. In terms of sampling methods some studies adopted certain rules of thumbs (e.g., using a minimum length of reviews or a threshold number of reviews per case in a rather arbitrary fashion), while others used all available data in its entirety without a good understanding whether these data could all "qualify" as true representation for the phenomenon under investigation. The empirical analysis in the Xiang, Du, Ma, and Fan (forthcoming) study further demonstrated that there are considerable differences in the representation of the hotel product as well as quality of review data with respect to a number linguistic, semantic and structural measures in major online review platforms. As such, they suggested that social media research using online review data must be cognizant of the nuances in data sources in order to make conscious, appropriate methodological decisions. We believe that this is an issue of paramount importance to research validity and hence healthy development of social media analytics research in hospitality and tourism.

In this study, we aimed to understand two issues related to social media data quality. First, places are idiosyncratic and tourism products have long been seen as experiential and highly personal (Fesenmaier, Wöber, & Werthner, 2006; Gretzel & Fesenmaier, 2002); as such, whether the findings of one data set/source can be applied to another in a reliable way may impact the generalizability of the study results. Second, recent research has shown that there is trustworthiness issue in online review data. For example, Schuckert, Liu, and Law (2016) showed that there were inconsistencies between the overall rating of a hospitality product and its specific ratings (e.g., location and service), which may indicate suspicious reviews. With this in mind, we specifically focused on a text classification algorithm's sensitivity to data samples. Through this research we expected to gain understanding of reliability of review data and develop methods to detect and ameliorate data inconsistencies in order to improve the validity and usefulness of social media research.

3 Research Design, Data and Methods

We designed this study surrounding the self-identified travel purpose and its relationships with the textual contents of hotel reviews using TripAdvisor data. In TripAdvisor each reviewer is asked to provide one of a set of five travel purposes, including "business", "family", "couple", "solo", and friends", when submitting his/her feedback on the recent trip. Figure 1 displays the review text in association with self-identified travel purposes which were presented as recommendations for other reviews. Based upon recent literature, textual content of online reviews is a reflection of product experience and evaluation and, consequentially, can be used to detect market segments (Fan & Gordon, 2014; Xiang, Schwartz, Gerdes, & Uysal, 2015). Therefore, we postulated that there should be an inherent relationship between self-identified travel purpose and actual product experience and evaluation in hotel reviews. In hospitality and tourism, travel purpose especially business versus leisure is one of the basic variables to understand market segments (Mcleary, Weaver, & Hutchinson, 1993). As such, we aimed to develop a methodology using machine learning techniques to predict travel purpose using review textual content and, through this process, to assess the algorithm's sensitivity to different data samples (including different cities and data sizes). This process primarily consisted of three steps: (1) collect the data; (2) build the text classifier; and, (3) test the classifier's performance by applying to different data samples.

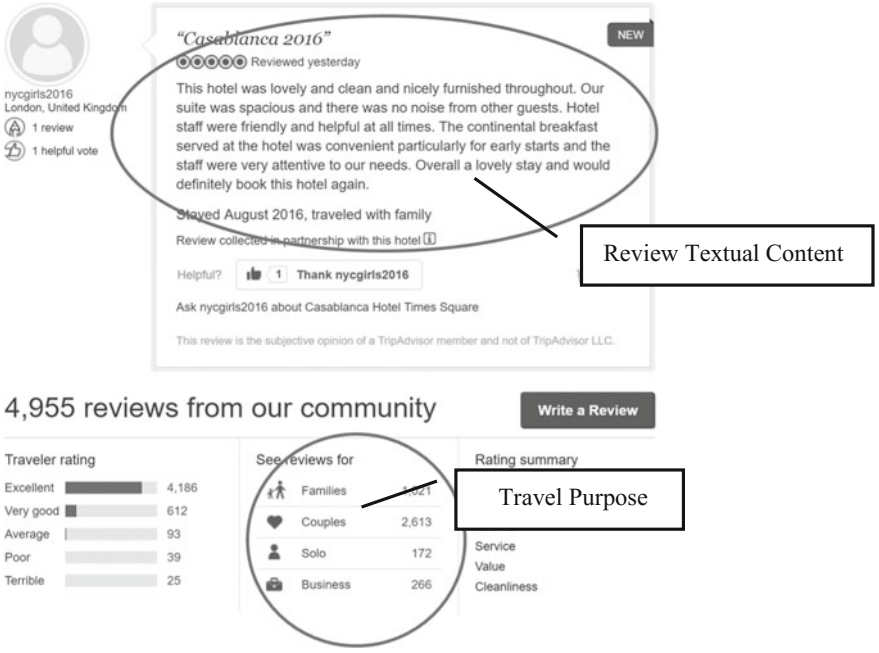

Fig. 1 A screenshot displaying review content and self-identified travel purpose

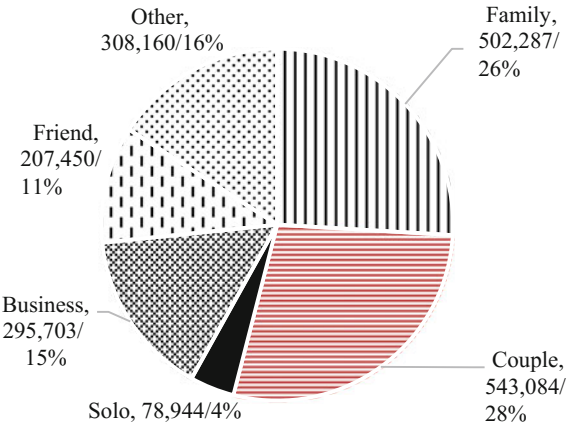

Fig. 2 Number of reviews based on travel purpose labels (total: 1.94 million)

Data were collected in summer 2016 using a Web crawler to extract review contents along with other information such as rating and travel purpose from TripAdvisor. We followed a schema developed by Xiang and Pan (2011) to collect data on all hotel properties searchable in TripAdvisor in 18 cities in the US, which to a certain degree represent different population sizes, geographic locations, and degree of being "touristic". In total, there were approximately 1.94 million reviews contributed by approx. one million users in the data set. On average, there were >100 K reviews per city and approx. 40 per hotel (a total of 2,676 hotels). The distribution of different travel purposes labelled by online reviewers is displayed in Fig. 2. As can be seen, the largest group was "couple" (28%) followed by "family" (26%). Group with "business" travel purpose constituted 15% of the entire review data set.

Following the standard text analytics procedure (Fan & Gordon, 2014), data were pre-processed prior to being used to build and test the text classification algorithm. This procedure included a number of operations to "tokenize" the data such as lemmatization and lower-case transformation after the removal of numbers and punctuations. Further, we removed reviews with a length of shorter than eight words because very short reviews, in general, did not contain sufficient, meaningful linguistic entities as features to feed into the classifier. On average, there was approx. 83.3% reviews left for each city. Also, we consolidated four travel purposes, namely "family", "couple", "friends", and "solo", into one large category "leisure". With the classification task simplified to only two outcomes (i.e., "business" and "leisure"), we expected to observe more closely how the classification algorithm responds to variations in data samples. Table 1 shows the results of pre-processing. As can be seen, the total number of reviews was reduced to approx. 1.61 million and review labelled as "leisure" constituted the majority of reviews (1.32 million; 82%).

We used the remaining data to build the text classifier following the classic text classification methodology (e.g., McCallum & Nigam, 1998; Nigam, McCallum,

Table 1 Results of data pre-processing

City	No. of reviews	No. of reviews after			Percentage (after/before) (%)
		Total	Business	Leisure	
Americus	1,753	1,155	124	1,031	65.9
Myrtle Beach	105,021	83,399	3,232	80,167	79.4
Aiken	1,818	1,478	438	1,040	81.3
Bradenton	2,910	2,588	29	2,559	88.9
Champaign	4,206	3,782	1,081	2,701	89.9
Pueblo	3,280	2,946	683	2,263	89.8
Chattanooga	24,908	21,800	3,558	18,242	87.5
Orlando	327,609	270,003	36,287	233,716	82.4
Las Vegas	463,412	379,041	49,954	329,087	81.8
Fort Worth	17,789	15,711	6,231	9,480	88.3
Baltimore	31,523	27,835	8,360	19,475	88.3
Memphis	31,430	26,153	5,636	20,517	83.2
San Francisco	152,535	127,402	25,198	102,204	83.5
Indianapolis	38,470	33,550	12,688	20,862	87.2
San Jose	14,054	11,453	5,631	5,822	81.5
Dallas	59,478	48,781	21,319	27,462	82.0
Chicago	165,036	141,391	40,951	100,440	85.7
New York City	490,187	414,601	71,719	342,882	84.6
Total	1,935,419	1,613,069	293,119	1,319,950	83.3

Thrun, & Mitchell, 2000). We selected New York City as the basis for this operation because it has the largest number of hotels and reviews. More importantly, NYC is a destination for both business and leisure travellers and therefore, it may represent the diversity of the domain of hotel product. We randomly selected 27 k reviews from those labelled as "business" and "leisure", respectively, for training and the rest of the data set for testing. Note the total number of reviews labelled as business was approx. 70 k, which provided the "ceiling" of the training data. We selected 27 k for the training set to ensure there was more in the testing set for reviews labelled as "business". We extracted TF-IDF indices from each review as features. TF-IDF, abbreviation for term frequency–inverse document frequency, is a numerical value used in text mining to reflect how important a word is to a document within a collection or corpus. We then used six classic machine learning algorithms including SGDClassifier, Random Forest, Adaboost, Linear SVC, Logistic Regression, and Multinomial Naïve Bayes as candidate algorithms for text classification. These algorithms were implemented using open-source packages written in the Python programming language (Bird, Klein, & Loper, 2009). We used a number of standard metrics including precision, recall, accuracy and F-1 score, to evaluate the performance of these algorithms. The results showed that

Multinomial Naïve Bayes produced the best performance and thus was adopted for testing data sensitivity in all subsequent procedures. Once the algorithm was determined, we conducted a series of testing to assess its sensitivity to different data samples.

4 Results

We first tested the Multinomial Naïve Bayes classifier on two sample sizes, i.e., 27,000 and 40,000 reviews in the training set, on the NYC data. As can be seen in Table 2, the average performance measures such as precision, recall, accuracy, and F-1 scores were quite high with some variations (the last column "support" refers to size of testing data). Especially, these measures were particularly high with the prediction of "leisure"; however, the precision of the prediction of "business" were very low in both tested data samples (i.e., 27 and 40 k), suggesting there might be a large number of business reviews misclassified as leisure.

To examine the reliability of review data across different data contributing domains, we conducted a second test on the classifier using data from three large cities, namely Chicago, San Francisco, and Orlando. As can be seen in Table 3, performance of the classifier was in general consistent across these cities. However, it seems that precision and recall were lower for the prediction of business travel purpose in the Chicago data set while higher for the prediction of leisure in the Orlando data set. Overall, the performance was slightly lower among these three cities than NYC. This suggests that, although the classifier had consistent performances across these domains, there were some nuances likely caused by the idiosyncrasies of these geographic areas. Once again, compared to other performance measures precision was quite low for the prediction of business among all data sets.

Following this, we conducted a third test by applying the classifier to the overall data set including all other 17 cities by varying the training data size from 27 to 40 k and then 70 k (i.e., ceiling of all business reviews). As can be seen from the test results in Table 4, the classifier's performance was in general similar to those tested on the data sets for the large cities. Recall of prediction for both business and leisure were in the mid 70%, while the precision of the prediction of leisure reached as high as 93%, which suggests that the classifier was reliable over different data

Table 2 Results of test 1—NYC only

No. of Reviews	Accuracy		Precision	Recall	F-1	Support (k)
27 k	0.806	Business	0.36	0.71	0.47	~45
		Leisure	0.95	0.82	0.88	~315
		Avg./total	0.88	0.81	0.83	~361
40 k	0.804	Business	0.29	0.72	0.41	~32
		Leisure	0.90	0.81	0.88	~302
		Avg./total	0.91	0.76	0.81	~334

Table 3 Results of test 2 – NYC versus three large cities

	Accuracy				Precision			Recall			F-1			Support (k)
	27 k	40 k	70 k		27 k	40 k	70 k	27 k	40 k	70 k	27 k	40 k	70 k	
Chicago	0.78	0.78	0.78	Business	0.59	0.59	0.59	0.75	0.76	0.77	0.66	0.67	0.67	~41
				Leisure	0.89	0.89	0.89	0.79	0.79	0.78	0.84	0.84	0.83	~100
				Avg./total	0.80	0.80	0.80	0.78	0.78	0.78	0.79	0.79	0.79	~141
San Francisco	0.79	0.79	0.78	Business	0.48	0.48	0.48	0.76	0.77	0.78	0.59	0.59	0.59	~25
				Leisure	0.93	0.93	0.93	0.79	0.79	0.79	0.86	0.86	0.85	~101
				Avg./total	0.84	0.84	0.84	0.79	0.79	0.78	0.80	0.80	0.80	~126
Orlando	0.82	0.82	0.82	Business	0.41	0.41	0.40	0.73	0.75	0.76	0.52	0.53	0.52	~36
				Leisure	0.95	0.95	0.96	0.83	0.83	0.83	0.89	0.89	0.89	~234
				Avg./total	0.88	0.88	0.88	0.82	0.82	0.82	0.84	0.84	0.84	~270

Table 4 Results of test 3—NYC versus all other 17 cities

No. of reviews (k)	Accuracy		Precision	Recall	F-1	Support (k)
27	0.78	Business	0.44	0.74	0.55	~221
		Leisure	0.93	0.78	0.85	~977
		Avg/total	0.84	0.78	0.80	~1199
40	0.77	Business	0.43	0.75	0.55	~221
		Leisure	0.93	0.77	0.85	~977
		Avg/total	0.84	0.77	0.79	~1199
70	0.77	Business	0.43	0.76	0.55	~221
		Leisure	0.93	0.77	0.84	~977
		Avg/total	0.84	0.77	0.79	~1199

samples across different cities. However, the precision of the prediction of business travel purpose was as low as 43% and consistent among data samples, which suggests that there might be anomalies with the data instead of the algorithm.

In order to diagnose the problems, we calculated a TF-IDF centroid (which could be understood as the "average" of all features in the textual data) for business travel purpose using the 70 k reviews in the NYC data set. We rank ordered the misclassified reviews according to their similarity distances from the centroid (the assumption was that the farther away, the more likely it was different from the reviews with "true" business travel purpose). As shown in the word cloud below (Fig. 3), many of these reviews misclassified as leisure actually contained information about travel purpose as business. In total, there were approx. 227 k misclassified reviews, which, obviously, suggests that there were lots of "noise" within the data set, leading to the very low performance of the classifier algorithm.

In order to ameliorate this problem, we took one step further to refine the method by "cleaning" the data so that we could achieve better performance on the classifier. We calculated a TF-IDF centroid for both business and leisure using the NYC data. Then, we polarized the training data (NYC) and test data (all other 17 cities) by

Fig. 3 Word cloud generated from reviews misclassified as leisure

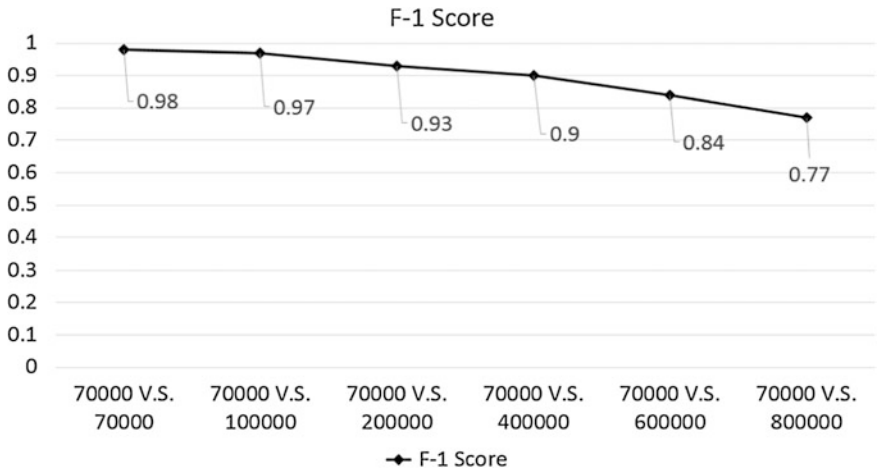

Fig. 4 Classifier performance (F-1 score) with NYC (training) versus Non-NYC (test) by fixing training data size

rank ordering them based upon the similarity distance from the centroids, respectively and independently. We conducted a self-classification test to make sure the polarized data were clean enough. Finally, we run the same classifier repeatedly on the same testing scenarios based upon different data samples.

Figures 4 and 5 show the performance (represented as F-1 score) using the NYC data as training and overall data from other 17 cities as test data, while controlling the data size of training and test, respectively. In Fig. 4, the classifier's performance was very high when the test data size was relatively small and remained quite high even when the test data size reached 400 k. There was a noticeable "drop" in the performance when the train data size reached 600 k and even further at 800 k. Since the data were "polarized" based upon the similarity distance from the centroid, this clearly suggests that once the test data size reached certain level, there was much noise introduced into the test data and hence the drop in the classifier's performance. Figure 5 shows the same testing results by fixing the test data size at 200 k with varying training data size from 10 to 70 k (the ceiling of the number of reviews labelled as business in the NYC data). As can be seen, while there was slight improvement as the training data size increased, the classifier's performance was consistently high (>0.90 in the F-1 score).

With the polarization method, we calculated the number of classified cases for business and leisure using three sample of training data, i.e., 10, 40, and 70 k, from NYC against data from all other 17 cities. As can be seen (Table 5), overall the classifier's performance was quite consistent among all data samples, although the more training data used, the more reviews classified as business. This seems to suggest that larger sample size of the training was, it was more likely able to capture more "true" reviews with business travel purpose. The results also show huge discrepancy between proportions of reviews labelled as either business or leisure

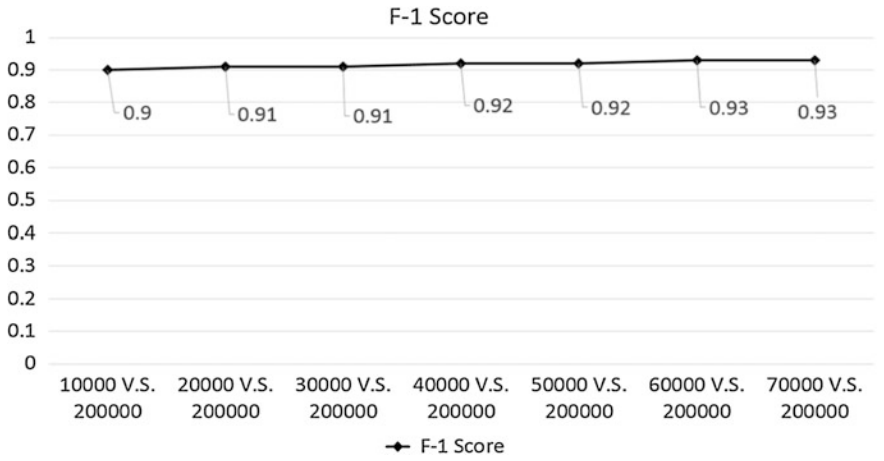

Fig. 5 Classifier performance (F-1 score) with NYC (training) versus Non-NYC (test) by fixing test data size

and those classified as such by the algorithm. For example, originally there were 221,434 (18.5%) reviews labelled as business using 10 k NYC data as training data; however, the classifier identified 528,795 (44.1%) reviews as business travel purpose. This indicates that the problem of mislabelling especially for reviews by business travellers was, indeed, very severe. However, the polarization method seemed to be able to effectively address this problem.

Table 5 Results of classification using polarized data—NYC versus all 17 cities

		Classified as business		Classified as leisure		Total	
		N	PCNT (%)	N	PCNT (%)	N	PCNT (%)
10 K V.S. 17 cities	Labelled as business	176,203	14.7	45,231	3.8	221,434	18.5
	Labelled as leisure	352,592	29.4	624,619	52.1	977,211	81.5
	Total, %	528,795	44.1	669,850	55.9	1,198,645	100.0
40 K V.S. 17 cities	Labelled as business	180,093	15.0	41,341	3.4	221,434	18.5
	Labelled as leisure	359,962	30.0	617,249	51.5	977,211	81.5
	Total, %	540,055	45.1	658,590	54.9	1,198,645	100.0
70 K V.S. 17 cities	Labelled as Business	188,555	15.7	32,879	2.7	221,434	18.5
	Labelled as Leisure	397,174	33.1	580,037	48.4	977,211	81.5
	Total, %	585,729	48.9	612,916	51.1	1,198,645	100.0

5 Discussion, Implications and Future Research

In order to understand the reliability of social media data, we devised an analytical study to assess the sensitivity of a text classification algorithm to different data samples of online hotel reviews collected from TripAdvisor. The results show that the text classification algorithm had consistent performance on data samples drawn from different tourist city sets. And, the algorithm seemed to respond to different data sizes in a fairly reliable way. However, the algorithm underperformed in certain areas of the classification task due to mislabelling of the original data. We suspect that these errors could have come from a number of sources such as the traveller's lack of accurate memory of the trip experience or the ambiguity in some of these travel purpose labels, although it seems to have resulted primarily from business travellers mistakenly labelling their trips as leisure-related.

This study contributes to the theoretical development of big data (social media) analytics in hospitality and tourism by revealing a severe problem in the reliability and trustworthiness of social media data. Particularly, websites like TripAdvisor have been used as the "premier" sampling fields for social media research in hospitality and tourism and beyond. This study demonstrates that drawing data from even a highly reputable website like TripAdvisor might yield unreliable results and thus potentially invalid conclusions. For instance, a recent article examined the relationship between travel purpose and hotel rating in TripAdvisor without knowing the mislabelling problem in travel purpose in the first place, which might lead to unwarranted conclusions (Banerjee & Chua, 2016). Machine learning programs and other analytical techniques may only be as good as the learning materials fed into them. Although our analysis focused on only one type of data (i.e., self-identified travel purposes), we believe that the issues we identified could be general and inherently related to the nature of user-generated contents. By demonstrating data inconsistencies and effective means to address these problems, this study will further raise the awareness of data quality issues and support the theoretical foundations of social media analytics research.

This study also has several practical implications. Besides the discovery of the data quality problems, the text classification algorithm seemed able to reliably and effectively predict travel purpose based upon the textual contents of online hotel reviews. Its performance was further enhanced after removing the noise by polarizing the data. This technique can be applied to the development of segmentation tools for target marketing in the hospitality and tourism industry as well as online decision support systems for hoteliers, online travel agencies and travel community sites and beyond based upon authentic, trustworthy social knowledge.

There are several directions for future research. First, user evaluation can be conducted to validate the effectiveness of the machine learning algorithm. Second, the classifier could be further refined and enhanced to detect other travel purposes such as family and couple, which could be a much more useful tool for marketing purposes. Finally, the noise detection techniques especially the polarization

treatment to data can be used as a methodology applicable to the assessment of data quality within other contexts of social media analytics.

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"Don't Let Me Think!" Chinese Adoption of Travel Information on Social Media: Moderating Effects of Self-disclosure

Junjiao Zhang, Naoya Ito, Wenxi Wu and Zairong Li

Abstract Taking travel information adoption on social media from a dual-route persuasive communication viewpoint, a modified elaboration likelihood model (ELM) predicted by technical adequacy was constructed. An online survey (N = 357) was conducted in China to examine which route (argument quality vs. source credibility) is more effective and how self-disclosure biases their influences on the usefulness of travel information. Derived from Structural Equation Model (SEM) and multi-group analysis, results revealed the significant impact of technical adequacy on both argument quality and source credibility. Source credibility is more effective and positively affects perceived information usefulness, which in turn has a significantly crucial impact on travel information adoption. Contrary to the hypothesis, Chinese users with higher self-disclosure on social media are inclined to weaken the impact of source credibility on travel information usefulness.

Keywords Travel information adoption · Source credibility · Technical adequacy · Self-disclosure · Elaboration likelihood model

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1 Introduction

Social media has become an efficient venue for individuals' adoption of travel information and socialization in travel issues. Correspondingly, it contributes large amounts of User-Generated Content (UGC) and self-information, which are paramount resources for successful travel businesses. Differing from the conventional e-commerce that relies on system or web design features (Chen & Shen, 2015), social media focuses on users' interactive experience in technical adequacy. It further enhances the efficiency of online information process. Nonetheless, little effort has been spent on the role of technical adequacy in driving travel information process.

As an information cognitive process, travel information adoption on social media has been drawn upon using Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986), which is considered a feasible persuasive communication theory with two components: argument quality and source credibility. However, it is insufficient to shape the entire communication process: information receiving, cognitive processing, and attitude formation (Tang, Jang, & Morrison, 2012). Although both components have been rigorously investigated as positive predictors of information usefulness, which route is more effective remains unclear.

Travel information adoption is also a social cognitive process, because travel behaviour is primed to rely largely on UGC. It fosters the social exchange between individuals, but may result self-disclosure calculus, a weigh of benefits and costs. As a crucial indicator of social exchange, self-disclosure reflects to what extent individuals would voluntarily disclose self-information to others (Lin, Zhang, Song, & Omori, 2016). In essence, high self-disclosure is beneficial for reciprocal information exchange but raises individuals' perceived risk of compromised privacy. Therefore, how travel information adoption varies according to individuals' self-disclosure is an equally important question needing to be solved.

In order to address the limitations, this study suggests a modified ELM model with two routes, argument quality and source credibility, predicted by technical adequacy of social media and moderated by self-disclosure. It aims to examine which route is more effective and how self-disclosure biases their effects on information usefulness in travel information adoption on social media.

2 Theoretical Background and Hypotheses

2.1 Extension of Elaboration Likelihood Model

Elaboration Likelihood Model (ELM) is a dual-process theory with two routes in predicting persuasive messages: a central route and a peripheral route (Petty & Cacioppo, 1986). The central route requires cognitive effort in processing argument quality of messages (Teng, Khong, Goh, & Chong, 2014). The peripheral route

occurs under some simple principles, such as source credibility. The two routes would vary according to individuals' motivation and ability. As a valid approach in elucidating the information cognitive process, scholars have extended the ELM theory into social media contexts from its constructs, determinants, and moderators.

Constructs. Sussman and Siegal (2003) proposed the information adoption model (IAM) based on ELM. It sheds light on the crucial mediating effect of information usefulness between argument quality, source credibility and information adoption. IAM greatly advanced ELM's applicability in the research of UGC and travel information adoption (Chung, Han, & Koo, 2015). However, more constructs are still needed to shape the panorama of persuasive communication. Since attitude formation in the ELM theory is primarily driven by external information (Bhattacherjee & Sanford, 2006), the role of external variables should also be expounded. Zhang, Lu, Gupta, and Zhao (2014) clarified that technological features of social media significantly motivate consumers' participation in social commerce. That is, technical adequacy is vital as an external variable that drives persuasive communication.

Determinants. In the central route, messages have been measured in both quality and quantity. The former primarily includes argument quality (Zhang, Zhao, Cheung, & Lee, 2014), valence, extremity, and type (e.g., Yan et al., 2016; Filieri, 2016). The latter, such as reviews volume or length, has been used to identify the usefulness of eWOM (Yan et al., 2016; Hlee, Lee, Yang, & Koo, 2016). In the peripheral route, scholars have found the significant impact of source metrics on information usefulness via social media, including source trustworthiness, expertise, attractiveness, similarity, and homophily (Zhang, Ito, Wu, & Li, 2016; Kim, Cheong, & Kim, 2015). Derived from a social psychology perspective in this study, argument quality is expected to determine the central route, while credibility towards dissimilar and similar sources is expected to examine the peripheral route.

Moderators. Due to individual differences and situational factors, individual-oriented characteristics have been employed to be moderators that strengthen the central route and weaken the peripheral route in information adoption on social media. They are related to recipients' prior knowledge, expertise, involvement level (Yan et al., 2016), and perceived risk (Tseng & Wang, 2016). Situational moderators have also been indicated, such as personal relevance (Bhattacherjee & Sanford, 2006), product type (Hlee et al., 2016), and media richness (Chung et al., 2015). Although moderating effects have been taken seriously in academics, literature is rare from the relational perspective. Considering the important role of relationship in users' decision in social media contexts, this study employs users' self-disclosure to appeal for more understanding of its bias effects in persuasive communication on social media.

2.2 ELM and Travel Information Adoption

Information adoption is conceptualised as "a process in which people purposefully engage in using information" (Cheung, Lee, & Rabjohn, 2008). This study follows its three dimensions: following, recommending, and sharing (Teng et al., 2014). Compared to the postulates of ELM, high-involvement situations in travel issues facilitate consumers to combine both routes to assess information usefulness on social media (Zhang et al., 2016). However, which route persuades more effectively remains unclear. As an exploratory research, the research model is presented in Fig. 1.

Argument quality. Argument quality describes the persuasive strength of arguments embedded in information (Bhattacherjee & Sanford, 2006). It consists of perceived informativeness and perceived persuasiveness, which are proxies of information quality and argument strength (Zhang, Zhao, Cheung, & Lee, 2014). Filieri & McLeay (2013) indicated that information quality strongly predicts travellers' adoption of online reviews about accommodation. Researchers also found that reviews persuasiveness could reduce Chinese consumers' uncertainty towards recommendations from online review sites (Zhang et al., 2014). Hence, the following hypothesis is proposed:

H1 Argument quality of travel information positively affects individuals' perceived information usefulness on social media.

Source credibility. Source credibility refers to the extent to which "an information source is perceived to be believable, competent, and trustworthy by information recipients" (Cheung et al., 2008). It reveals that individuals may judge information with little effort, such as source trustworthiness, expertise, and attractiveness (Zhang et al., 2016). Ayeh (2015) found that trustworthiness exerts significant influence on travel information usefulness via TripAdvisor. Research in product reviews also suggested that source expertise increases individuals' belief of the diagnostic value of messages (Kim et al., 2015). Source attractiveness examines similarity, familiarity, and likeability between receivers and sources. It has been confirmed that higher receiver-source similarity generates more trust of online

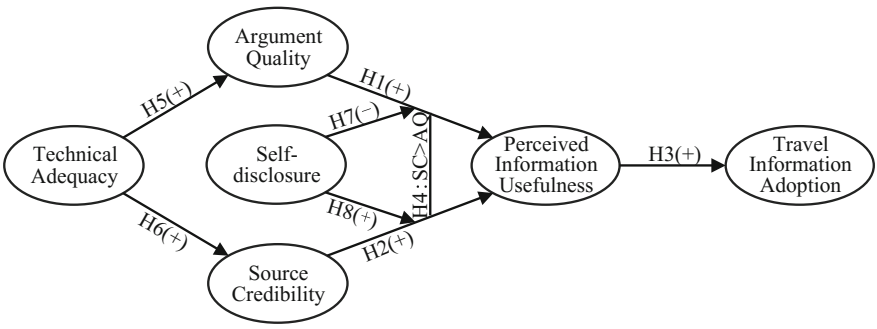

Fig. 1 Research model

reviews in tourism products (Racherla, Mandviwalla, & Connolly, 2012). In sum, this study raises that:

H2 Source credibility of travel information positively affects individuals' perceived information usefulness on social media.

Perceived information usefulness. In the social media context, as a main predictor of information adoption, perceived information usefulness could be construed to be individuals' belief that using social media would enhance their task performance (Ayeh, 2015). Consumers who perceive travel information to be useful tend to have favourable responses to its adoption. This study therefore proposes that:

H3 Perceived information usefulness positively affects travel information adoption on social media.

Dual-route. Previous studies have discovered that richer media modalities (e.g., interactive web pages) could draw a high-involvement exposure and shift users' attention from message itself to source. That is, individuals prefer to rely more on the peripheral route. Chung et al. (2015) clarified that Facebook as a rich media depends less upon receivers' ability to access information. Its high social presence perceived by users further strengthens the effect of source credibility on travel information usefulness. In terms of Chinese, Zhang, Hu, & Zhao (2014) explored Chinese impulse purchase on group shopping websites. They argued that although reviews quality predicts perceived usefulness of websites, it might not produce positive effect. Yan et al. (2016) emphasised that Chinese consumers would refer to the comments from their friends on social media, when they perceive low credibility of eWOM on e-commerce sites. That is in line with the proposition that travel-related social media such as Qyer or Douban in China is facilitating the social socialisation in tourism activities (Li, Zheng, & Wang, 2015). Michopoulou & Moisa (2016) found that Chinese travellers not only follow various travel accounts on social media but also place much more trust in peer reviews than British travellers do. Thus, the priority of source credibility might be higher than argument quality among Chinese.

H4 Source credibility more effectively affects perceived usefulness of travel information on social media than argument quality does.

2.3 Technical Adequacy

Technical adequacy relies on system features and depicts the appropriate technologies adopted by web retailers, such as search facilities, navigation, personalisation, and interactivity (Liao, Palvia, & Lin, 2006; Chen & Shen, 2015). Focusing on subjective properties, social media has three core technological features: perceived interactivity, perceived personalisation, and perceived sociability (Zhang et al., 2014). Thus, this study defines technical adequacy as the technological features of social media from an interaction perspective. First, interactivity, such as two-way communication and user control, has been identified in driving effectually

cognitive process of recommendations (Doong, Wang, & Fong, 2009). Second, personalisation reflects the adaptability of social media in meeting individual preferences (Zhang et al., 2014). Li, Liang, and Wei (2013) suggested that online retailers could improve personalised interaction to meet consumer needs of content and increase their trust in service encounters. Third, perceived sociability could promote consumer socialization, and in turn reinforces product involvement on social network sites (SNS) (Wang, Yu, & Wei, 2012). Lee (2017) emphasised that the delivery of brand e-stickers on messaging apps such as Facebook Messenger and Wechat fulfils user needs for sociability, generating positive attitude towards brands. In sum, technical adequacy could essentially explore individuals' participation in the information cognitive process.

H5 Technical adequacy positively affects argument quality of travel information on social media

H6 Technical adequacy positively affects source credibility of travel information on social media.

2.4 Self-disclosure

Self-disclosure refers to the extent that individuals voluntarily and intentionally reveal their thoughts, feelings, and experiences to others (Liu, Min, Zhai, & Smyth, 2016). It generally appears in five sub-dimensions, including amount, depth, honesty, intent, and valance (Wheeless & Grotz, 1976). Based on social exchange theory (Homans, 1958), self-disclosure is essential for interpersonal relationship and results from the weigh of benefits and costs. As a reciprocal benefit-exchanging process, it also facilitates interpersonal communication in the information cognitive process.

In social media contexts, self-disclosure has been mainly examined from the exchange between benefits and costs (Liu et al., 2016; Huang, 2016). Accordingly, high self-disclosure would generate perceived intangible benefits, such as social support, intimacy relationship, and reciprocity. These benefits could further produce much higher self-disclosure (e.g., Chen & Shen, 2015). For instance, Huang (2016) proposed that users who disclose personal information on SNS would receive information and emotional support from their social networks, increasing the amount of useful information they can obtain. Chen & Shen (2015) verified that social support from other members on Douban promotes users' confidence in the ability of information providers, which in turn predicts their intention to self-disclose. In line with reciprocal benefits, users who disclose information first would receive an equal or greater disclosure from others, which is beneficial for acquiring information from trustworthy sources (Lin et al., 2016). Therefore, self-disclosure may positively interact with source credibility and may enable individuals to perceive more useful and helpful information on social media. Conversely, individuals with low self-disclosure may perceive more risk or costs towards information communication on social media. Tseng and Wang (2016)

indicated that perceived risk weakens the association between source credibility and information usefulness on travel websites. Accordingly, low self-disclosure may relatively strengthen the effect of argument quality on information usefulness. Thus, this study assumes that:

H7 Argument quality has stronger effect on travel information usefulness among individuals with low self-disclosure than among individuals with high self-disclosure.

H8 Source credibility has stronger effect on travel information usefulness among individuals with high self-disclosure than among individuals with low self-disclosure.

3 Methodology

3.1 Measurement

A multi-item approach was used to measure all six variables derived from previous studies with slight modification. Technical adequacy was measured as a second-order factor with three first-order factors (Zhang et al., 2014). Self-disclosure was measured as a formative variable with five items (Liu et al., 2016): when using social media, "I often talk about myself", "I intimately and fully reveal myself", "My self-disclosures are completely accurate reflections of who I really am", "I consciously intend to reveal the feelings about myself", and "I normally express good feelings about myself". All items were measured using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). Two groups of English teachers with proficiency in both English and Chinese back translated the original English questionnaire.

3.2 Data Collection and Sampling

Data were collected in the second week of January 2016, using an online survey among university students and people with incomes in China. Out of a total of 524 responses, 357 valid respondents were collected as they had used at least one social media for the purpose of travel information in the past 12 months. Among 357 samples, 58% were female and 42% were male with an average age of 24.48. Wechat (93.3%), Weibo (72.5%) and QQ (68.1%) were the three top social media platforms they had frequently used. Demographics are shown in Table 1.

Table 1 Demographics of respondents (N = 357)

Characteristics		Frequency	%
Gender	Male	150	42
	Female	207	58
Age	19–22	122	34.2
	23–29	202	56.6
	30–35	31	8.7
	$\geq$ 36	2	0.6
Education	High school	6	1.7
	Junior college	20	5.6
	University	256	71.7
	Graduate school	75	21
Occupation	Student	175	49
	Private Enterprise employee	103	28.9
	Government and public sector employee	66	18.5
	Self-employed and other	13	3.6
Social media visiting for tourism information before trip (per week)	$\leq$ 1 time	132	37
	2 times	79	22.1
	3 times	53	14.8
	4 times	13	3.6
	$\geq$ 5 times	80	22.4

4 Data Analysis and Results

The research model was tested using AMOS 23.0 with a two-step analytical procedure, measurement model and structural model. Furthermore, multi-group analysis was employed to evaluate the moderating effects.

4.1 Reliability and Validity

The measurement model was validated based on assessments of convergent validity and discriminant validity, in which convergent validity was examined by composite reliability (CR) and average variance extracted (AVE). As presented in Table 2, all CR and AVE values are greater than the recommended levels 0.70 and 0.50, respectively (Fornell & Larcker, 1981). Cronbach's α value and item loadings are also sufficient well. Discriminant validity would be sufficient when the square root of AVE for each construct is higher than its correlations with other constructs (Fornell & Larcker, 1981). As shown in Table 3, discriminant validity was also

Table 2 Results of convergent validity testing

Construct/item	Loadings	Cronbach's α
Technical adequacy (CR = 0.814, AVE = 0.595)		0.766
INT1. The tools provided by social media allow me to create content as per my imagination	0.792	
INT2. Social media allows me to change or influence the way the medium looks	0.832	
PER1. Social media stores all my preferences and offers me extra services based on my preferences	0.775	
PER2. Social media does a pretty good job guessing what kinds of things I might want and making suggestions	0.642	
SOC1. Social media enables me to develop good social relationships with others in the environment	0.816	
SOC2. Social media enables me to feel part of the virtual community	0.639	
Argument Quality (CR = 0.844, AVE = 0.526)		0.849
AQ1. The travel information from social media is easily understandable[a]	–	
AQ2. The travel information on social media is sufficient	0.851	
AQ3. The travel information on social media is comprehensive	0.860	
AQ4. The travel information on social media is up-to-date	0.654	
AQ5. The arguments of travel-related reviews are convincing	0.610	
AQ6. The arguments of travel-related reviews are strong	0.604	
Source Credibility (CR = 0.892, AVE = 0.584)		0.900
SC1. The information sender is knowledgeable in travel	0.701	
SC2. The information sender is experienced	0.727	
SC3. The information sender is trustworthy	0.904	
SC4. The information sender is reliable	0.897	
SC5. The information sender and I share similar viewpoints	0.678	
SC6. The information sender and I share similar interests	0.633	
Perceived Information Usefulness (CR = 0.908, AVE = 0.767)		0.908
PIU1. Social media is informative for travel information adoption	0.862	
PIU2. The travel information from social media is valuable	0.901	
PIU3. The travel information from social media is helpful	0.864	
Travel Information Adoption (CR = 0.752, AVE = 0.607)		0.739
TIA1. I intend to search travel information on social media[a]	–	
TIA2. I have followed the travel information from others on social media	0.874	
TIA3. I can make the right travel decision through social media[a]	–	
TIA4. I am willing to share travel information on social media	0.671	

Note [a]The item was deleted following the confirmatory factor analysis. *Model fit index*. $\chi^2(195) = 388.359$, $\chi^2/df = 1.992$, $p < 0.001$, GFI = 0.908, NFI = 0.917, CFI = 0.956, RMSEA = 0.053

Table 3 Correlations of constructs

Variable	*M*	*SD*	TA	AQ	SC	PIU	TIA
Technical adequacy (TA)	4.84	0.92	***0.771***				
Argument quality (AQ)	4.67	1.05	0.539	***0.725***			
Source credibility (SC)	4.68	0.96	0.616	0.690	***0.764***		
Perceived information usefulness (PIU)	5.28	0.95	0.592	0.540	0.583	***0.876***	
Travel information adoption (TIA)	5.12	1.05	0.601	0.427	0.511	0.716	***0.779***

Note The boldface diagonal element is the square of average variance extracted (AVE)

fulfilled. Therefore, good reliability and validity of the measurement model were supported.

4.2 Structural Model Evaluation

Structural equation model (SEM) results are performed in Fig. 2. A good model fit was demonstrated ($\chi^2(197) = 320.84$, $\chi^2/df = 1.629$, $p < 0.001$, GFI = 0.924, NFI = 0.931, CFI = 0.972, RMSEA = 0.042). Argument quality ($\beta = 0.237$, $p < 0.05$) and source credibility ($\beta = 0.471$, $p < 0.001$) positively predicted perceived information usefulness ($R^2 = 45.7\%$). Perceived information usefulness ($\beta = 0.719$, $p < 0.001$) had significantly positive impact on travel information adoption ($R^2 = 51.7\%$). Therefore, these results supported H1, H2, and H3. Meanwhile, the positive impact of source credibility on perceived information usefulness was much higher and more significant than that of argument quality, supporting H4. H5 and H6 were also supported through the significantly positive

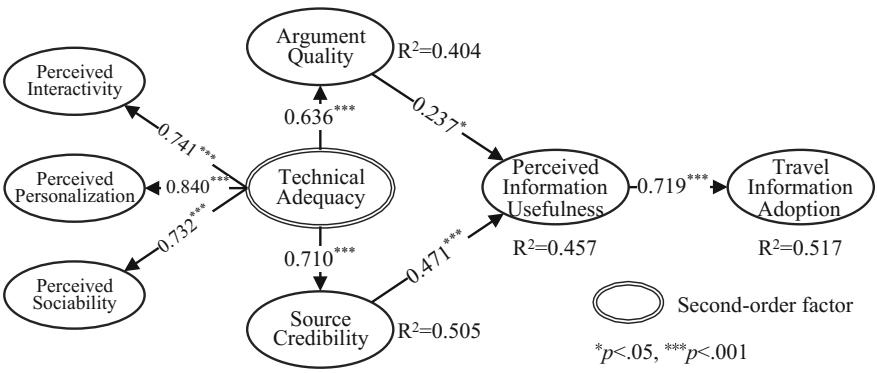

Fig. 2 Results of structural equation model

effects of technical adequacy on argument quality ($\beta = 0.636$, $p < 0.001$, $R^2 = 40.4\%$) and source credibility ($\beta = 0.710$, $p < 0.001$, $R^2 = 50.5\%$).

4.3 Moderating Effects

To test the moderating effects of self-disclosure, a formative variable, the median split ($Mdn = 4.40$) was used to categorise samples into two groups: high self-disclosure group ($n = 161$, $M = 5.31$) and low self-disclosure group ($n = 196$, $M = 3.60$). Two means were significantly different ($t(357) = 23.679$, $p < 0.001$), confirming the different levels of self-disclosure between the groups. Accordingly, multi-group analysis was conducted to compare the differences in path coefficients (Chung et al., 2015). Table 4 lists the results. The effect of argument quality (AQ) on perceived information usefulness (PIU) was significant in the high self-disclosure group, but the t-Value was not significant, not supporting H7. Contrary to the expectation, source credibility (SC) more significantly and positively affected perceived information usefulness in the low self-disclosure group with significant t-Value. Thus, H8 was also not supported.

5 Discussion and Implications

First, this study drew insights of the ELM theory and extended its constructs into Chinese adoption of travel information in social media contexts. Technical adequacy of social media was explored to be a trigger that motivates individuals' participation in travel information process. Meanwhile, it further enhanced the significant impact of argument quality and source credibility on travel information usefulness.

Second, this study also enriched the knowledge of source credibility and confirmed the *take-the-best* decision principle. Source credibility proved to be more effective than argument quality in determining travel information usefulness on social media. It challenged several previous findings that argument quality is more persuasive (Bhattacherjee & Sanford, 2006). However, in social media contexts, the information overload may increase individuals' cognitive load in assessing information and may guide them to the peripheral cues. It also implied that Chinese

Table 4 Structural path coefficient differences

Moderator	Path	High self-disclosure	Low self-disclosure	t-Value
Self-disclosure	AQ → PIU	0.597^{*}	0.114^{ns}	1.639^{ns}
	SC → PIU	0.106^{ns}	0.517^{***}	-2.364^{*}

$^{*}p < 0.05$, $^{***}p < 0.001$

travellers are more likely to be driven by brand recognition (Michopoulou & Moisa, 2016), which is the thought of "Don't let me think".

Particularly, it contributed an exploration in understanding the interaction between self-disclosure and information processing on social media. Contrary to expectations, the moderating effects of self-disclosure were not consistent with the hypotheses. Self-disclosure negatively rather than positively moderated the effect of source credibility on perceived information usefulness. Since the empirical study targeted Chinese, there may be four considerable explanations: (1) Although individuals prefer to evaluate information from its source credibility, they make a decision from an utilitarian perspective and hope less self-disclosure could receive more favourable information (Lee & Cranage, 2011); (2) Individuals are more likely to disclose superficial information about themselves on social media, such as interests and personal matters. It may be not helpful in building more trust of sources; (3) Because individuals with higher self-disclosure relatively take more privacy control and setting experience (Liang, Shen, & Fu, 2016), they are considered confident in assessing the argument quality of information; (4) For Chinese, intimate self-disclosure more frequently occurs in groups of close and trusted persons because of the Confucian ideology. This mode of *default trust* strengthens their willingness to self-disclose, but it also makes them neglect the assessment towards source credibility.

This study also has significantly practical implications for travel practitioners targeting Chinese travellers. First, travel marketers should take full advantage of social media features to interact with consumers by distributing personalised recommendations. In order to enhance user stickiness, it is essential to build travel-driven social relationships in the user community. Second, travel practitioners would greatly benefit from collecting more experienced and knowledgeable followers through their certificated accounts on social media, such as Weibo and Wechat. Third, unique self-information management system should be adopted to increase user empowerment in privacy settings. In that case, precision marketing would be more effective according to consumers' different levels in self-disclosure. For consumers with high self-disclosure, it is more helpful to provide them rich content and to maintain their *default trust* in the community. For consumers with low self-disclosure, users who are experienced or have similar interests should be recommended to reduce consumers' perceived risk, and in turn to promote information usefulness.

6 Conclusion

In order to draw deeper understanding of the persuasive communication, this study focuses on (1) what factor more effectively affects travel information adoption driven by social media features and (2) how users' self-disclosure biases the cognitive process. An empirical study in China was conducted based on a modified

ELM model, which was triggered by technical adequacy and moderated by self-disclosure. Results verified a significant explanation of the main effects in the research model (H1–H6). Particularly, it suggested that source credibility is more effective in assessing travel information usefulness than argument quality. Although moderating effects of self-disclosure were not consistent with the expectations (H7, H8), the findings offered an exploration of its specific influences in Chinese adoption of travel information.

The main limitation is related to the participant sample. It focused on Chinese youth, the major market in tourism in China. Though findings of this study are representative, whether the research model is powerful in the general population should be tested in future research. Meanwhile, more research is needed to flesh out what self-disclosure means for Chinese to boost the understanding of travel information adoption.

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Do Local Residents and Visitors Express the Same Sentiments on Destinations Through Social Media?

Mohammed Jabreel, Antonio Moreno and Assumpció Huertas

Abstract The opinions and feelings expressed by users in their comments through social media have a great influence on other users and their tourism-related decisions. This study, based on a novel sentiment analysis, has analysed 3,000 tweets by local residents and 3,000 tweets by tourists at 10 major destinations in Europe with the aim of finding out their polarity. The results show that, in general, the tweets by both local residents and tourists tend to be positive. However, some destinations have high percentages of neutral and even negative tweets. This fact shows the importance for destinations of conducting sentiment analysis studies and strategic branding, involving a greater implication and participation of their publics.

Keywords Sentiment analysis · Twitter · Social media · Destination brand · User-generated content

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1 Introduction

The main transformation that social media have caused in the communication of tourists' destinations has been their ability to allow the diffusion of stakeholders' knowledge, information and opinions (Buhalis & Law, 2008). Moreover, through their comments they also share their experiences and emotions (Munar & Jacobsen, 2014).

Several studies (Fotis, Buhalis, & Rossides, 2012; Xiang & Gretzel, 2010) corroborate that contents generated by users (UGC) through social media tend to be perceived as a more reliable information than the one offered by more institutional sources such as official websites of tourist destinations or travel agencies. This is why all Destination Marketing Organizations (DMOs) have to build and manage their social media.

DMOs are aware of the importance of UGC and they want to know what users say about their destination. In the academic field, there have been studies about the impact of the content generated by tourists on the tourist market and on the demand for destinations (Xiang & Gretzel, 2010). Knowing what information users comment on or want to know about a destination can help tourist destinations to create a brand and identity. It also provides knowledge about the image of the destination, as the image is shaped by the comments of all stakeholders.

The public co-creates the brand image of the destinations (Singh & Sonnenburg, 2012). Their comments and experiences influence the image formed by other users. Therefore, knowing the information that stakeholders consider relevant and publish is most useful for DMOs' brand communication strategies. However, content analysis does not suffice. It must also be analysed whether these stakeholders speak well or badly of destinations through sentiment analysis. It is important to find out whether their comments are positive or negative, because that will have a positive or negative influence on the image that other users form of the destination. Negative comments from other users' experiences spread very quickly and have a great potential to damage the destinations' image and reputation (Siano, Vollero, & Palazzo, 2011).

Images of destinations are created in the minds of users through the confluence of many sources of information (Ho, Lin, & Chen, 2012). In fact, they are created based on the actions and communications of a whole set of stakeholders. Therefore, DMOs must analyse the comments and evaluations of all of them. The external public for analysis par excellence are tourists, since their experiences and assessments are fundamental for other users who have never visited the place. Moreover, the most influential internal public are the local residents. Their comments are also highly influential because they know the region better than anyone else does and their views generate great credibility.

Hence, this study aims to analyse whether the tweets posted by local residents and tourists of some European destinations are positive or negative and whether different results are observed according to the type of stakeholder. To do so, a new automated sentiment analysis that measures the sentiment of users' tweets has been designed and implemented. Thus, this is the first application of a fully automated

state-of-the-art sentiment analysis system to compare the polarity of the comments of local people about their city with those of their visitors. The rest of the paper contains a brief review of related works (Sect. 2), a description of the new semantic analysis (Sect. 3), its application to a case study of 10 major European destinations (Sect. 4) and some final conclusions (Sect. 5).

2 Related Works

2.1 Influence of UGC on Social Media and Credibility

Previous studies have examined the use of social media and their impact on their tourism-related decisions (Xiang, Wöber, & Fesenmaier, 2008). Others have focused on knowing what users look for and are interested in (Ayeh, Au, & Law, 2013) in these new media, or on which information they share through them (Kang & Schuett, 2013).

The credibility users give to UGC determines the influence it will have on their tourism-related decisions as well as the use they will make of social media (Zeng & Gerritsen, 2014). Credibility is given by the knowledge of the person who publishes on social media. Stakeholders' opinions have greater credibility than the information supplied by tourist destinations because they are the opinions of third parties who explain their experiences and have no vested commercial interest. As Munar and Jacobsen (2013) assert, the credibility of social media is basically generated by information sources and social relationships.

According to Neidhardt, Rümmele, and Werthner (2016), users are influenced by the feelings of other users. The social influence on tourism-related decisions is based on the fact that individuals adopt their thinking and behaviour according to other individuals of the social network of friends and acquaintances. Given that the social networks involve actors and connections, users' feelings, opinions, and behaviour are influenced by others.

As has been seen in previous studies, the credibility that users give to social media varies, but if users' comments are negative, the impact is far higher. It is difficult to measure precisely the impact of negative comments, but it is certain that the problems, disappointments or bad experiences that a stakeholder can have at a destination or when receiving a tourist service will easily lead users to choose another destination or service. In view of this reality, it is essential to analyse whether users' comments are positive or negative.

2.2 Stakeholders in Brand Co-creation and Sentiment Analysis

Images about tourist destinations and their brands depend on the information of different sources and contents generated by diverse stakeholders: friends and

acquaintances, tourist companies, suppliers, but also tourists and residents of the destination. With the emergence of social media and user-generated content, stakeholders, especially tourists and residents, have become important sources of information. They are also co-creators of the brand image, because they can publish information about the destination that will influence other users' perceptions. Several authors have increasingly adopted the paradigm of co-creation (Aitken & Campelo, 2011). They understand brand image as a continuous, collective process of interaction between suppliers, stakeholders and consumers.

The main external stakeholders are the tourists. They share their experiences through social media (Jacobsen & Munar, 2012), which has a far bigger impact on users' emotions and achieves greater credibility.

Local residents are also, for several reasons, very important internal stakeholders in the co-creation of destination brands: first, because they know the destinations better than anyone else as they live there; secondly, because their behaviour builds the identity of the destination; and finally, because with the content they generate in social media, they co-create the destination brand with more credibility than any other stakeholder.

Given that both tourists and local residents are important brand co-creators, for a destination brand to be consistent, images of these two major stakeholders should not be contradictory, but must be complementary and consistent. A study by Beckmann and Zenker (2012) revealed significant discrepancies between the tourists' and the residents' mental representation of a specific place brand.

Considering all the above, DMOs have to integrate a more participatory vision of destination branding from the outset (Kavaratzis, 2012; Aitken & Campelo, 2011) and involve these stakeholders in the process of creating and communicating target brands. In the reality of professional practice, however, very few destinations involve these stakeholders in the branding process (Kavaratzis, 2012).

DMOs must analyse what content the stakeholders post in social media about the destination to find out if the image they convey is the image of the destination they wish to convey. Moreover, they have to find out if what has been said is positive or negative. The main problem for the analysis of users' comments and reviews in social media is their large number, which hinders manual analysis. Hence, computational and mathematical methods have been developed that allow the automated analysis of large amounts of data (Neidhardt et al., 2016). Studies based on sentiment analysis extract the subjectivity of a text to see if what has been said is objective or subjective, and also to see if it is positive or negative (Niedhardt et al., 2016).

In previous studies, Ye, Zhang, and Law (2009) analysed the different existing approaches of sentiment analysis, its accuracy in the measurement of online reviews about tourist destinations, and its effect. Lee, Singh, and Chan (2011) used text mining techniques to extract the keywords from descriptions that users made of hotels to find out what they spoke about and whether they were positive or negative.

Gräbner et al. (2012) used a lexicon-based approach to analyse tourism reviews and to classify them as either positive or negative. In the same vein, García et al. (2012) introduced an approach that used lexical data to calculate the sentiment of tourism reviews. Currently, research in this area is evolving towards sentiment analysis focused on the texts of micro-blogs (García-Pablos et al., 2016) and on using text mining techniques to measure users' free comments or those of travel forums (Niedhardt et al., 2016), among others.

Following the line of previous studies, in this work a new automated methodology of sentiment analysis, which can be very useful for both DMOs at tourist destinations as well as for academics researching in these fields, has been developed. It will be explained in detail in the following section.

3 Methodology

The methodological framework focuses on the retrieval and sentiment analysis of English tweets sent by visitors and local citizens of a set of destinations. The basic steps of the analysis are the following:

- Selection of the destinations to be analysed.
- Retrieval and pre-processing of two sets of English tweets from each destination (see Sect. 3.1). The first one contains the messages sent by local citizens, whereas the second one is composed of tweets sent by non-local people, which are assumed to be tourists or visitors.
- Extraction of a set of features from each tweet (Sect. 3.2).
- Classification of the polarity of each tweet (positive, negative or neutral), using a novel sentiment analysis system based on a complex set of features and a Support Vector Machine classifier (Sect. 3.3).
- Comparative analysis of the sentiment of the opinions of locals and visitors in the chosen destinations (case study in Sect. 4).

3.1 Retrieval and Pre-processing of the Tweets

A crawler tool developed by the authors, twiQuery, allows retrieving tweets using different filters, like language, time and geo-location. It was used to collect the English tweets sent within a radius of 15 km of the city centre of each of the selected destinations during a specified period of time. From the collected tweets, two sets of tweets were defined. The set L ("the tweets from the local citizens") is the set of tweets sent by users that declare explicitly the destination as their home location in their Twitter profile. The set T ("the tweets from the visitors") is composed of those tweets that were sent by users which have specified a home location different from the destination (a stronger condition could be used in future

works, e.g. the location of the home city in a foreign country). For each destination 6,000 tweets were randomly selected, 3,000 for each of the sets.

In order to study if the tweets are actually referring to the destination, and not to other places, a manual analysis of 400 random tweets sent by local people from London (one of the destinations of the case study described in the next section) was made. The results were the following: 292/400 (73%) were related to local aspects of the destination (local news, weather, restaurants/food, local transport, tourist attractions and cultural activities, local stores and businesses, local sports, etc.), 11/400 (2.75%) were explicitly referring to other locations or global news, and 97/400 (24.25%) were conversational or personal life comments, etc. Thus, the references to other places seem to be minimal (in future versions of the system, this kind of tweets could even be removed by detecting Named Entities referring to other places).

In the pre-processing stage, URLs and user mentions are removed and all the text of the tweet is converted to lower case. After that, it is tokenized and POS-tagged using the Ark Tweet NLP tool. The suffix "_NEG" is added to all the words that appear in a negated context, which is a segment of a tweet which starts with a negation (e.g. no, do not) and ends with a punctuation mark.

3.2 *Feature Extraction*

The polarity of a tweet (positive, negative or neutral) is determined by a new sentiment analysis system developed by the authors, SentiRich, which is fed with the following features:

- Basic text features: n-grams (contiguous sequences of *n* tokens, with *n* from to 1 to 4) and negated n-grams (the same information, but only with the tokens that appear in negated contexts).
- Syntactic features: number of occurrences of each POS and bi-tagged features (combination of bi-grams with their POS tags).
- Lexicon features: it includes the estimation of the polarity of the tweet according to seven popular opinion lexicons. The information about the positive/negative polarity of each word is combined, as described in Jabreel and Moreno (2016), to obtain a global polarity of the tweet for each lexicon. Other lexicon-dependent features in this category include the average polarity of the positive/negative terms, the score of the last positive/negative term, and the maximum/minimum positive/negative score.
- Semantic features: each word of the tweet is mapped to a predefined cluster that groups together words that have similar meanings. Two sets of semantic clusters were used: the 1,000 ones defined in the Ark Tweet NLP tool and the 4,960 n-gram clusters obtained with the Word2vec tool (Dong, Wei, Yin, Zhou, & Xu, 2015).

3.3 Classification

SentiRich determines the polarity at the tweet level. It is a classifier based on a Support Vector Machine (SVM).[1] This classifier was trained using the Twitter2013 training and development sets from SemEval2013, a well-known worldwide competition of natural language processing systems based on semantic analysis. In Jabreel and Moreno (2016) it was shown that its accuracy (68–72%, depending on the input set) outperformed the one of the state-of-the-art sentiment analysis systems.

4 Case Study: Top Destinations in Europe

This section describes which were the destinations selected for the case study. After that, it provides the results of the sentiment analysis system and discusses them.

4.1 Selection of Destinations

A previous work (Jabreel, Moreno, & Huertas, 2016) studied how the tweets from a destination communicated the emotional values associated to the destination brand. In that study the Twitter accounts of the top 25 European destinations in 2014, according to Tripadvisor, were analysed. It was finally decided to select the 10 destinations that had sent more than 3,000 English tweets: Amsterdam, Athens, Barcelona, Berlin, Budapest, Dublin, Edinburgh, London, Rimini and Vienna. The study was further extended to the communication of emotional values by locals and visitors; thus, two sets of 3,000 tweets for each of these 10 destinations were already available, and they are the ones that have been used in this case study (except Rimini, with only 1,000 local tweets). These tweets were sent in the high tourism seasons of 2014 and 2015 (June 15th–Sep. 1st) and the low tourism season of 2014 (Oct. 15th– Dec. 30th).

4.2 Results and Discussion

SentiRich classified the 6,000 tweets of each destination (3,000 local and 3,000 visitors) as positive, negative or neutral. Table 1 shows examples posted by local people from London and classified using SentiRich.

The results are shown in the form of radial plots in Fig. 1 (tweets from local people) and Fig. 2 (tweets from visitors). Each of the concentric lines represents

[1]Jabreel and Moreno (2016) present further technical details about the classifier.

Table 1 Example of tweets classified using SentiRich

Tweet	Polarity
i can't get over how beautiful that was. #alexandermcqueen @ victoria and albert museum https://instagram.com/p/50rsc7mk3c/	Positive
hanging around in #chinatown #soho #vscocam #vscogrid #lantern @ china town london https://instagram.com/p/5ozk4pszyg/	Neutral
pretty terrible weather for a festival in West London. Wet and humid :-(	Negative

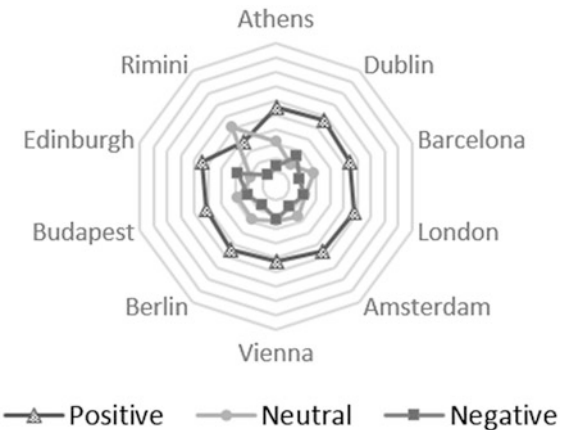

Fig. 1 Analysis of the tweets from local citizens

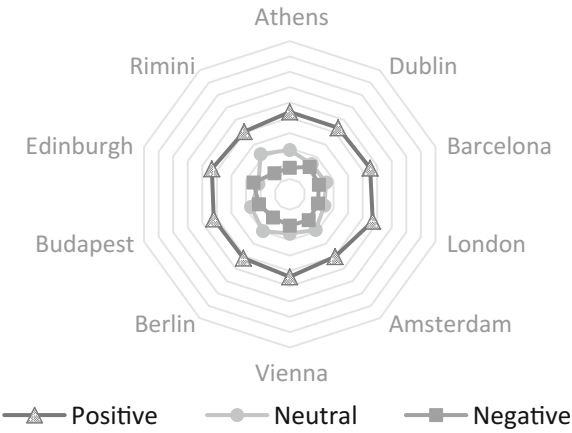

Fig. 2 Analysis of the tweets from visitors

10% of the tweets. For example, in the case of the 3,000 local tweets from Amsterdam, 1,687 (56.2%) were qualified as positive, 801 (26.7%) were seen as neutral and the rest (512, 17.1%) were classified as negative.

4.2.1 Local Residents Tweets

The analysis can be started by looking at the sentiments expressed in the tweets of local residents shown in Fig. 1. It can be seen that the percentage of positive views is quite homogeneous in all the destinations analysed, with values between 51 and 57%, with the single exception of Rimini, which has a much lower value (38%). This means that, in general, local residents or public mostly make positive comments about their town/city in social media. These results have very positive effects for the co-creation of the image of destinations and their brands, since the influence of the comments of the local public is very high among external users or potential tourists.

The range of neutral opinions is slightly wider, from 18% (Edinburgh, Dublin) to 30% (Athens); again, Rimini is the exception with a very high number of neutral opinions, 51%. Thus, in general, neutral comments achieve medium percentages.

Finally, the range of negative views is even wider, from only 9% in Rimini to more than 27% in Edinburgh. These big differences are interesting, since their percentages of positive comments are very uniform. It should be noted that the negative comments about tourist destinations or services greatly influence tourism-related decisions by other users and potential tourists, especially if they are made by local residents.

It is surprising that the local residents of destinations such as Dublin or Edinburgh publish more tweets with a negative tone than a neutral one. The residents of these two destinations make mostly positive tweets but, at the same time, they also express negativity with higher percentages than neutral ones. This shows the critical spirit of these local residents. However, the lower the percentages of negative tweets, the better for the image of the destination.

Rimini shows quite the opposite of the two previous destinations, since it has the lowest percentage of positive and negative tweets and the highest number of neutral ones with a big difference compared to the rest of destinations.

The cities with a larger difference between positive and negative opinions are Athens (54% vs. 14%, a 40% difference) and Amsterdam (39%), whereas the smaller differences are Edinburgh (26%), and Rimini and Vienna (29%). It should be noted that, the greater the difference between positive and negative tweets and the lower the percentages of the latter, the better it will be for the global image and reputation of the destinations.

The analysis now will be concentrated on the analysis of different destinations. Noting the ones that convey a more positive, a more neutral and a more negative global vision through the tweets of their local residents. Athens and Amsterdam are the destinations with the most positive global tweets, because they have the highest percentages of positive and the lowest percentages of negative tweets. This can be seen graphically in Fig. 1. The tweets by the local residents at these two destinations co-create a more positive image for these places compared to other destinations.

Let us analyse the results represented graphically in Fig. 1. It would be most desirable for the triangle to be in the outer ring, which would indicate very high

positive percentages, the neutral dot between the triangle and the square, towards the centre of the circle, and the square practically in the centre of the circle, which would indicate a minimum percentage of negativity. This is what is displayed graphically for the tweets for Athens and Amsterdam.

However, the destination showing the most neutral tweets is Rimini, with a big difference from other destinations. This is clearly seen in Fig. 1, where the dot of the neutral comments is superior to both the negative comments (square) and even the positive ones (triangle). The DMO of this destination should analyse carefully the content of the tweets of its residents and try to find out why their contents are less positive and more neutral.

Finally, the most negative tweets by local residents are for Edinburgh and Dublin. This is clearly seen in Fig. 1, where the squares of the negative comments exceed even the dots of the neutral ones. The DMOs at these destinations should also analyse what aspects their residents tweet about in a negative tone, improve the situation of the region and integrate local residents into the branding of the region addressing the communication of the destination brand also towards them and getting them involved in the entire process.

4.2.2 Tourist Tweets

The analysis of the tweets sent by visitors (Fig. 2) shows a much more homogeneous result for all the cities, in the three categories. All the destinations show between 50 and 56% of positive opinions. This means that for all destinations the majority of tweets by tourists published in the place are positive, which has a truly positive influence on the creation of the image and the reputation of the tourist destinations through social media. As mentioned previously, tourists are important co-creators of the brand image of destinations and their comments are highly influential for the tourism-related decisions of other users because they hold great credibility and reduce the risk in their tourism-related decision-making.

On the other hand, 23–29% of the comments of the tweets by tourists are neutral, showing highly homogeneous percentages. The only exceptions are Edinburgh (21%) with the lowest percentage and Rimini (32%) with the highest one.

Finally, Fig. 2 shows percentages between 17 and 24% of negative tweets. Rimini and Athens are the destinations with the least negative tweets (17%) and Edinburgh scores the highest percentage (24%), followed by Dublin (with 22%).

The difference between positive and negative opinions ranges from 29% (Edinburgh, Amsterdam) to 37% (London). As already mentioned, the greater the distance between the two, the better, since it will mean that the positive tweets are far more numerous than negative ones, which is what is desired.

The destinations that have the most positive comments by tourists will now be analysed. It may be seen that London and Athens show a more positive view overall, since they have the highest positive comments and the lowest negative ones. Therefore, they are the destinations for which tourists reported a more positive image with their tweets. It can be said that the tourists of these two destinations very

positively co-create the brand image and reputation of these places through their comments in the tweets published in the place while they are visiting it, and this is very influential for the tourism-related decisions of other users.

Rimini is the destination that also displays the most neutral comments by its tourists, with a great difference compared to other destinations. Finally, the most negative tweets by visitors are for Edinburgh and Dublin. This is clearly seen in Fig. 2, which shows that the negative square of Dublin almost coincides with the neutral dot, and the squares of the negative comments on Edinburgh exceed the dot of the neutral comments. The DMO of this last destination should also ascertain what aspects its tourists' negative tweets deal with and improve the situation of the region or of the tourist services which these negative comments talk about.

4.2.3 Comparative Analysis Among the Tweets of Local Residents and Tourists

It can be appreciated that, in general, the percentages of positivity, negativity and neutrality of tourists' tweets are more homogeneous among destinations than those of the local residents. In other words, the tweets of the local residents, especially neutral and negative ones, show a higher variability. This shows more diverse opinions among the local residents, which might be caused by the dissatisfaction of local residents with their towns/cities or by the different involvement of local residents in the branding of destinations with the DMO.

It seems natural that residents, who know the destination much better than tourists, are more neutral or negative in their tweets than tourists, who spend only a few days in the place and usually only visit the most attractive spaces and tourist facilities. Interestingly, the percentages of tourists' neutral and negative tweets are more homogeneous than those of the local residents, but they have similar percentages.

In general, all percentages of tweets are very similar between residents and tourists. If the results are compared by destination, they coincide to a certain extent. The only difference is seen for positive tweets. The destinations with the most positive tweets by local residents are Athens and Amsterdam and for tourists Athens and London. Thus, it can be stated that Athens co-creates a very positive image with the tweets of its local residents and the tourists who visit it. This coincidence shows the satisfaction of various publics with the destination and at the same time conveys a positive view of the destination that is consistent among these different publics.

On the other hand, it is interesting that Rimini has such a high percentages of neutral tweets and that it coincides both in local residents' and tourists' tweets. However, the percentages of neutral tweets are higher among local residents.

Finally, it should be pointed out that Edinburgh and Dublin coincide in having the most negative tweets for both local residents and tourists, although the residents' tweets are more negative.

5 Conclusions

Taking into account the enormous credibility that users give to comments and opinions in social media of local residents and tourists about a destination, whose influence is greater than the contents generated by the actual destinations themselves, it is important for these comments, made by both local residents and tourists, to be positive. The results of the study have shown that tweets are mostly positive for both types of audiences. This means that they co-create a positive image of the destination, but with some differences and exceptions.

In addition, the fact that the percentages of local residents' tweets and those by tourists coincide to some extent is also positive, as it shows that there is no inconsistency between them regarding the image of the place insofar as positivity or negativity are concerned. As mentioned previously, consistency in a destination image communicated by the different publics is important for the co-creation of a successful and enduring image that is accepted, shared, and that will become established over time.

Social media generate relationships between users and the comments of others have a word-of-mouth influence, which is superior to the official information, especially if it comes from friends or acquaintances (Jacobsen & Munar, 2012) who visit the place or live there. Therefore, negative visions and comments, in turn, have a very negative influence. For this reason, exceptions like Rimini (which is the destination with most neutral tweets) and destinations that are reflected in a more negative light, both among local residents and tourists, should analyse why this happens and seek to fix it by managing more inclusive branding and taking into account the views of all of these stakeholders.

In addition, since users' feelings and opinions are greatly influenced by those of others (Xiang & Gretzel, 2010), sentiment analysis should be key for the management of DMOs and the branding of the destinations. The DMOs need to be aware of the opinions, positive or negative, of their publics in social media and in their tweets, because they will considerably influence, either positively or negatively, the formation of the image of the destinations among the rest of users around the world. For this reason, one of the main contributions of this study is the development of a methodology of sentiment analysis, which can be used by DMOs to gauge the feeling and the indices of positivity-negativity of the tweets of their stakeholders.

DMOs must not only analyse the tweets of tourists and local residents, but they must involve them in the branding of the destination, especially local stakeholders, who are the main ambassadors of the place (Kavaratzis, 2012). In this way, a more positive sentiment of local residents will be achieved and conveyed through their social media communications which in turn will influence the co-creation of the destination brand image.

As a final conclusion, the study shows the importance of sentiment analysis for DMOs and their management of branding. The results show that there is consistency in communication in the positivity and negativity of the tweets published by

tourists and local residents, which influences the co-creation of the generally positive destination brand image. However, DMOs must continue to analyse the sentiment of their tweets and manage their territory and its branding to achieve higher percentages of positivity and less negativity in tweets about their destination and in the comments in all social media in general.

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How Was Your Trip Experience While You Were Obsessed with Social Media? The Influence of Compulsive Social Media Usage on Trip Experience

Seob-Gyu Song and Dae-Young Kim

Abstract The growth of the Internet and mobile devices technologies has been deeply woven into people's lives. Although these developments have made people's lives more convenient, high dependence on these advancements has brought about serious problems such as addiction to Internet or social media. Many scholars in a variety of research realms have been investigating the dark sides of the technological progress, but there is a lack of studies about these issues in the hospitality and tourism. Therefore, this study attempted to examine the influence of compulsive social media usage on trip experience, memory, and satisfaction. The results show that high usage of social media in daily life causes higher frequencies of compulsive behaviours on social media during the trip. Consequently, the compulsive behaviours hinder tourists from appreciating or experiencing their trip, and as a result, the trip experiences, memories, and satisfaction become lower.

Keywords Social media · Social media addiction · Compulsive behaviours · Memorable tourism experience

1 Introduction

According to the survey conducted by Pew Research Center in 2015, in the United States case, the 89% of respondents are using the Internet and the 72% of respondents own a smartphone (Poushter, 2016). As these figures show, the rapid growth of the Internet technology and mobile devices have penetrated deeply in ordinary life and changed all aspects of people's lives. In addition, mobile devices (e.g., smartphones and tablet PCs) have become a daily necessity and are utilized as the principal means of using the Internet ubiquitously. Along with this change,

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many scholars in a variety of research realms started taking an interest and have studied about how our daily lives have changed and what kinds of advantages this technical growth has brought. However, in the majority of studies, researchers have been focusing on its positive impacts on our lives and there is a lack of studies about its negative influences on us.

Some negative consequences of technology advancement have emerging and scholars have turned their attentions to its negative influences. Especially, Internet addiction, smartphone addiction, and social media addiction have come to the fore and are being studied in various research fields such as psychology, sociology, computer science, and so on. When taking a look at the statistic figures, it is more obvious that addictive usage of the Internet and social media has become the rising problem in society at large. For instance, according to the report of Pew Research Center (Wormald, 2015), 76% of all Internet users are using social media and these figures are proportional to the number of addicted people. With standing out of this problem, the dark sides of technological development have been widely recognized by many researchers from the Internet addiction to social media addiction (Blachnio & Przepiorka, 2016). Unlike other study fields, there is few studies have been conducted regarding the problematic use of the Internet and social media in the realm of tourism and hospitality. Considering the popularity of tourism related contents on social media such as posting photos of destinations, foods, and leisure behaviours, it is necessary to examine negative impacts of social media on trip experiences and satisfaction.

To date, the majority of information technology (IT) studies in the hospitality and tourism have tried to verify that the advantages of the Internet, mobile devices, and social media have been helping tourists in terms of the information search, decision making process, and sharing their trip experiences and feedback. When it comes to the usage of social media, Amaro, Duarte, and Henriques (2016) argued that tourists start using social media before their trip, during and after their trip. In fact, social media has provided travellers with benefits such as trip information, the non-commercial photos and comments by other tourists, reviews and comments of destinations. Nevertheless, conversely, the research area that has been neglected in the hospitality and tourism is the impact of social media overuse on trip. Aladwani and Almarzouq (2016) mentioned that social media addiction has reached new levels and obsession with social media could bring about some serious problems. In related veins, it is reasonably assumed that the addiction to social media might disturb people's trip experiences considering the prevalent trip-related contents of social media.

Griffiths, Kuss, and Demetrovics (2014) asserted that compulsive social media use caused negative psychosocial and professional consequences. In tourism context, it could be understood that the compulsive social media use should affect tourists' experience negatively during their trip. As tourists compulsively use social media while traveling (e.g., compulsive photo-taking, posting, and checking comments or feedback), they are hindered in completely appreciating the destination or experiencing their trip. Based on the realizations, this study examines how the social media usage influence tourist experiences during the trip. Specifically, it

attempts to investigate (1) whether the degree of social media addiction affects the compulsive social media use during the trip, (2) whether the compulsive behaviours influences the trip experiences, and (3) whether the trip experiences influence tourist memory and satisfaction. The results of study will be anticipated to contribute to the hospitality and tourism IT literature providing meaningful findings and implications.

2 Literature Review

2.1 Social Media

Social media and Social Networking Sites (SNS) have been used over the length and breadth of everyday life since these tools offer virtual communities where people can interact with peers, share information, photos, videos, and so on (Kuss & Griffiths, 2011). Many statistics have been suggesting a reason for a rise in potential social media addiction. According to the report published by Pew Research Center (Wormald, 2015), about two-thirds of American adults (65%) are using social networking sites and it is continuously increasing from 2005 and 90% of young adults (whose ages 18–29) and 77% of adults whose ages 30–49 uses social media today. Another Pew's 2015 smartphone use report found that 93% of adults age 18–29 is using their smartphone not to be bored (Brastskeir, 2016) and they are seeking to interesting things by using social media. With this phenomenon, social media addiction, which is one subtype of Internet addiction, has come to the fore these days. This addiction could be fall into two types of behaviours: "an ever increasing need to engage with the object of the addiction, and a bad feeling when not getting enough of it" (Augenbraun, 2014). In other words, on one hand, the usage of social media makes person's life convenient, but on the other, it causes several negative impacts on person's life.

Kuss and Griffiths (2011) argued that excessive social media use can lead to a variety of negative consequences as a type of addictions (e.g., decrease in real-life communities, worsening of academic performance, relationship problems, and so on). Kirik, Arslan, Çetínkaya, and Gül (2015) asserted that addiction is defined as the excessive use of something that would ruin daily, working, social life. With respect to social media addiction (or social networking sites addiction), which refers to spending too much time on using social media, is categorized as cyber-relationship addiction and behavioural addiction symptoms can be observed from users (Choi & Lim, 2016). According to the research by Andreassen, Torsheim, Brunborg, and Pallesen (2012), the addiction is comprised of six core components: salience, tolerance, mood modification, relapse, withdrawal, and conflict. These components could result in specific behaviours of addicts such as compulsive behaviours and make addicts to be distracted from their original purpose of what they are doing.

Although not to the extent that the degree of using social media is addiction, the benefits of social media (e.g., ease of use and access) make people use social media more often and it could be assumed that we can observe compulsive behaviours regarding of social media a lot more than ever before. This would happen during travelling and tourists are no exception. People keep using social media and are showing specific compulsive behaviours while they are travelling due to the advantages of using social media and six core components of the addiction. With this in mind, we posit that the excessive usage of social media (or social media addiction) increases the frequencies of compulsive behaviours during travelling. When considering that one of main purpose of social media use is posting and sharing users' trip experiences (Berger & Schwartz, 2011), the possibility of compulsive behaviours of social media during travelling should be increased more than an ordinary life. Accordingly, the following hypothesis is posited:

Hypothesis 1 The degree of the addiction to social media in ordinary life is positively associated with the frequencies of compulsive social media use during the trip.

2.2 Compulsive Behaviour

Compulsive behaviour is not clearly defined hitherto. One of generally accepted definitions is "a response to an uncontrollable drive or desire to obtain, use, or experience a feeling, substance, or activity that leads the individual to repetitively engage in behaviour that will ultimately cause harm to the individual and/or others" (O'Guinn & Faber, 1989). Faber, O'Guinn, and Krych (1987) explained several commons of compulsive behaviours (e.g., compulsive buying, eating, gambling, exercise, hoarding, etc.) which are physical and/or psychological dependency, loss of control, subsequent interference with daily life function, presence of a drive, impulse or urge to engage in the behaviour, denial of the negative outcomes of continuing the behaviour, and continuous efforts to control or modify the behaviour without success. Parylak, Koob, and Zorrilla (2011) also stated that the main characteristic of compulsive behaviour is a pattern of repetitive, senseless behaviour. Furthermore, compulsive behaviour is generally utilized as a tool of coping with stress, escaping pressure or unwanted situations, or reducing unpleasant feelings (Faber et al., 1987) and has been understood as a behavioural addiction (Lo & Harvey, 2014; McIntyre, Wiener, & Saliba, 2015). This addiction might become a dysfunctional compulsive behaviour that occurs with specific activities used online, and not the Internet as a whole (Meerkerk, Van den Eijnden, Vermulst, & Garretsen, 2009). In other words, it could be understood that compulsive behaviours are resulted from the addiction and one of addiction symptoms.

In general, compulsive Internet use is described as being unable to control Internet use (Chou & Hsiao, 2000; Johansson & Götestam, 2004; Muusses, Finkenauer, Kerkhof, & Billedo, 2014), and is employed in order to capture the idea

of problematic behaviours (Chen & Kim, 2013). A substantial amount of studies found negative consequences of Internet usage (Brenner, 1997; Morahan-Martin & Schumacher, 2000; Pratarelli, Browne, & Johnson, 1999). Not only compulsive use Internet, but compulsive use social media also brought about several negative outcomes such as damaging personal, family and/or professional life, increasing isolation in real life, and bring harms to relationships (Guedes et al., 2016). It has been revealed that compulsive use behaviours could cause harmful consequences to academic performance (Huang & Leung, 2009; Samaha & Hawi, 2016; Scherer, 1997), GPA (Toker & Baturay, 2016), real daily life and relationships (LaRose, Kim, & Peng, 2010; LaRose, Mastro, & Eastin, 2001; Elphinston & Noller, 2011).

Since social media have been playing a vital role in the Internet marketing and electronic commerce (Casaló, Flavián, & Guinalíu, 2010), the scholars in the tourism have mainly paid attention to its function as a marketing tool. However, the negative effects on the trip experiences and satisfaction should not be excluded to understand the impact of social media in a holistic way. Considering the research findings from other study fields, the negative impact of compulsive social media usage while traveling should not be overlooked. This is because, as previously mentioned, it could be assumed that compulsive behaviours of social media are not decreased during the trip. On the contrary, compulsive behaviour might be increased as people can take a photo using camera of smart phone and they can post and share their trip experience with others at the same time during the trip. Wijesundara (2014) explored the usage patterns of social media via focusing on Facebook and suggested that several usages patterns (e.g., updating the status, using the comments feature, writing wall posts, etc.). When referring to these usage patterns, it is possible that compulsive behaviours during the trip could be divided into three behaviours: compulsive photo-taking, compulsive posting on social media, and compulsive checking comments and feedback. These compulsive behaviours might disturb tourists in appreciating the scenery and destination. As a result, tourists would not obtain the optimal travel experience, which decreases trip satisfaction due to the hindrance of compulsive behaviours. Based on the assumptions, this study try to examine whether compulsive social media usage have the deleterious influence on trip experiences and satisfaction. Therefore, the following hypothesis is posited:

Hypothesis 2 Compulsive behaviours on social media use during the trip are negatively associated with the trip experiences.

2.3 Tourism Experience, Memory, and Satisfaction

Otto and Ritchie (1995) defined tourist experience as the subjective and psychological perception. This concept is generally used to refer to a peak of experience

(Walls, Okumus, Wang, & Wun, 2011). When people are traveling, they may seek flow (Lin & Kuo, 2016) and they try to screen irrelevant thoughts out and focus on interacting with their trip environments (Novak, Hoffman, & Yung, 2000). This is because tourists can obtain optimal trip experiences when they take part in actively and are immersed in an activity. To provide memorable trip experiences for tourists is a key (Ritchie, Tung, & Ritchie, 2011) because the competitiveness of trip destination is derived from offering memorable experience to tourists (Richie & Crouch, 2003). In addition, memorable experiences are strong predictors of future decision-making (Kerstetter & Cho, 2004; Wirtz, Kruger, Scollon, & Diener, 2003).

Tourist experiences are divided into three categories based on the time: before the trip, during the trip, and post the trip (Aho, 2001). In this context, memorable tourism experience (MTE) is the concept focusing on the experience during the trip. MTE is defined as "a tourism experience that is positively remembered and recalled after the event has occurred" but not all experiences are memorable (Kim, Ritchie, & McCormick, 2012). Furthermore, MTE is based on how tourists evaluate their trip experiences (Tsai, 2016). There are positive correlation between trip memories and intention to revisit (Kozak, 2001; Lehto, O'Leary, & Morrison, 2004). In addition, tourists have a positive attitude toward their previous destinations if they remember specific events or attractions derived from a positive experience (Tsai, 2016). This indicates that favourable experiences create unforgettable memories by stimulating tourists' senses and emotions (Schmitt, 1999).

As aforementioned, tourists will not remember or recall their trip experience positively if they do not fully appreciate or experience the trip destination (Kerstetter & Cho, 2004). It could be understood, on the other hand, that tourists might not appreciate the destination fully if they are disrupted by other distracting factors on site (e.g., photo-taking, posting and checking social media compulsively). As a result, this distraction should interrupt tourists with reaching the optimal state of trip experience and the quality of their trip experiences will be lower. Since positive memories of previous trip are resulted from positive trip experiences (Pine & Gilmore, 2011; Tung & Ritchie, 2011), it could be possible to assume that the distractors (i.e., compulsive social media using behaviours during the trip) have a significant negative influence on the trip experiences and satisfaction. In this study, MTE scale developed by Kim et al. (2012) was employed to measure seven dimensions of tourists' trip experiences: hedonism, refreshment, local culture, meaningfulness, knowledge, involvement, and novelty.

Hypothesis 3 The memorable trip experiences are positively associated with the memory of trip.

Hypothesis 4 The memorable tourism experiences are positively associated with the trip satisfaction.

Hypothesis 5 The memory of trip is positively associated with trip satisfaction.

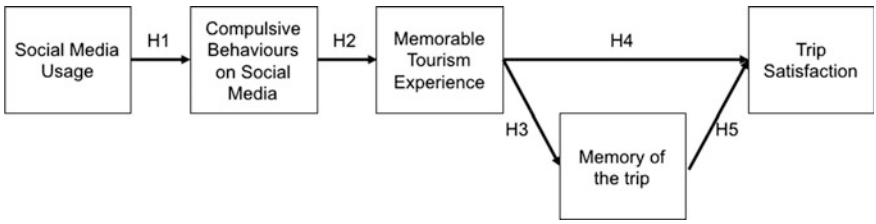

Fig. 1 Research framework

3 Methods

To achieve the purpose of this study, authors reviewed the related previous research about social media addiction, compulsive behaviours, and memorable tourism experience. The research model is depicted in Fig. 1.

The data was collected via online survey. For obtaining appropriate responses, the authors used screening questions such as 'Have you made any domestic leisure trip in the past 6 months?', 'Are you a professional or amateur photographer?', and 'Do you have social media (e.g., Facebook, Instagram, Snapchat, etc.) account(s)?'. Furthermore, all respondents should be a resident of the United States and were more 19 years old. The online survey was conducted from August 19th–24th, 2016 and a total of 197 usable questionnaires were collected.

This study employed the Bergen Social Media Addiction Scale (BSMAS) to measure the degree of the addiction to social media. Also, the authors revised the Compulsive Buying Scale developed by Faber & O'Guinn (1992) in order to assess the frequencies of compulsive social media using behaviours during the trip. In terms of MTE, this study adopted the scale established by Kim et al. (2012) using a seven-point Likert scale. Before testing the model, the confirmatory factor analysis (CFA) was performed to examine the validity of the measure for the social media addiction, compulsive behaviour, MTE, memory and satisfaction. All variables included in the model were predicted to measure the construct. Lastly, this study has examined the effects of each variable through structural equation modelling (SEM) using the software AMOS.

4 Results

4.1 Demographic Information

As for gender distribution, 39.6% of the respondents are male and 60.4% female. About 65% of respondents are between 19 and 39 years of age. The majority of respondents is White/Caucasian (74.6%). With regard to income, about 41.6% of participants responded their income range is from $20,000 to $59,999 and about

Table 1 Demographic information of participants (n = 197)

Frequency (%)		Frequency (%)	
Gender		Ethnic	
Male	78 (39.6)	White/Caucasian	147 (74.6)
Female	119 (60.4)	Hispanic/Latino	14 (7.1)
Age		American Indian/Native American	1 (0.5)
18–29	61 (31.0)	African American	16 (8.1)
30–39	68 (34.5)	Asian	11 (5.6)
40–49	33 (16.8)	Other	8 (4.1)
50–59	25 (12.7)	Income	
60 and over	10 (5.1)	<$20,000	20 (10.2)
Education		$20,000–39,999	42 (21.3)
High school or less	14 (7.1)	$40,000–59,999	40 (20.3)
Some college/Associate degree	63 (32.0)	$60,000–79,999	35 (17.8)
Bachelor degree	87 (44.2)	$80,000–100,000	31 (15.7)
Graduate/Post-graduate	33 (16.8)	>$100,000	29 (14.7)

33.5% answered their income range is from $60,000 to $100,000. Approximately 44.2% of respondents have a bachelor's degree, 32% have some college or associate degree, and 16.8% have a graduate or post-graduate degree (see Table 1).

4.2 Measurement Model Testing

First of all, the correlation analysis was conducted and Table 2 shows the results.

The reliability of the constructs was measured by using Cronbach's alpha value analysis. The Cronbach's alpha coefficients for the constructs ranged from 0.892 to

Table 2 Results of the correlation analysis

	CR	AVE	MEM	SMU	MTE	SAT	CB
MEM	0.910	0.772	**0.879**				
SMU	0.895	0.591	−0.444	**0.769**			
MTE	0.904	0.576	0.693	−0.206	**0.759**		
SAT	0.946	0.814	0.730	−0.382	0.599	**0.902**	
CB	0.924	0.802	−0.419	0.795	−0.291	−0.418	**0.895**

Note The bold numbers in the diagonal row are the square roots of the average variance extracted (AVE). *Key MEM* Memory of the trip, *SMU* Social media usage, *MTE* Memorable tourism experience, *SAT* Trip satisfaction, *CB* Compulsive behaviours on social media

0.953, which indicates adequate internal consistency for the measures. Each construct was analysed with Confirmatory Factor Analysis (CFA) to check the measurement scales are proper in the model and there was no indicator in each construct to be removed.

Then, the overall measurement model fit was tested. CFA was conducted to check whether collected data fit the model. The results of CFA were acceptable based on the range of goodness-of-fit indices. The Chi-square value was 353.288 with 206 degrees of freedom ($p < 0.000$) and the RMSEA value was 0.60, which met the requirement of good fit of less than 0.08 (Byrne, 1998). Other fit indices also indicate that the model was acceptable (NFI = 0.913, CFI = 0.961, TLI = 0.952).

In order to examine construct reliability, discriminant validity, and convergent validity, this study tested the standardized loading, the construct reliability, the error variance extracted, and the average variance extracted (AVE). The AVE of two constructs (social media addiction and memorable tourism experience) exceeded the minimum requirement of 0.5 (Fornell & Larcker, 1981). Composite reliability of each construct ranged from 0.895 to 0.946, confirming the internal consistency. As a result, five constructs were considered to be reliable and valid and this study proceeded to test the structural equation model.

4.3 Structural Model Testing

This study attempted to examine the relationship between the degree of social media usage, compulsive behaviours during the trip, memorable tourism experience, memory and satisfaction with experience. By using the SEM with the maximum likelihood method, the authors tested the relationships among five constructs in this model. The review of the SEM showed that the Chi-square value was 381.404 with 210 degrees of freedom ($p = 0.00$). The goodness-of-fit indices indicated the structural model had adequate fit (NFI = 0.906, CFI = 0.955, TLI = 0.946, RMSEA = 0.065).

The results are summarized in Table 3, indicating all five hypotheses were supported. Hypothesis 1 predicted that the degree of the addiction to social media causes the frequencies of compulsive behaviours during the trip. Hypothesis 2 was

Table 3 Results of the model

Hypotheses	Coefficient	Results
Social media usage → compulsive behaviours (H1)	0.795***	Supported
Compulsive behaviours → memorable tourism experience (H2)	−0.325***	Supported
Memorable tourism experience → memory (H3)	0.709***	Supported
Memorable tourism experience → satisfaction (H4)	0.196*	Supported
Memory → satisfaction (H5)	0.592***	Supported

Note $*p < 0.05$; $***p < 0.01$

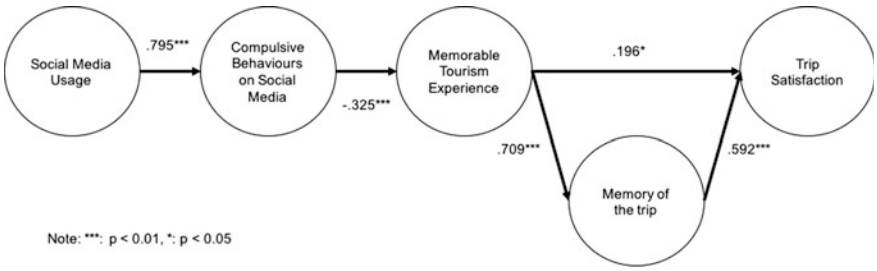

Fig. 2 The results of the structural equation model

also supported by showing the negative effects of compulsive behaviours during the trip on memorable tourism experience. Also, the results revealed that memorable tourism experience has a positive influence on memory and satisfaction with trip experience, supporting H3 and H4. Lastly, Hypothesis 5 was supported by showing that memory affects satisfaction with experience. Figure 2 represents a model with hypothesis testing results.

5 Conclusions

The Internet and social media have become one of daily necessities today. As the needs to understand negative impacts of social media usage increase, this study attempted to examine the negative facets of social media usages and compulsive behaviours during the trip. We found that social media usage was positively associated with compulsive behaviours on social media during the trip and these compulsive behaviours are negatively associated with the memorable tourism experience. Furthermore, the memorable tourism experience is positively associated with the memory of the trip and trip satisfaction. Consequently, we can conclude that the higher level of social media usage results in the specific compulsive behaviours and these behaviours bring about the decrease of memorable tourism experience. In other words, compulsive behaviours on social media during the trip hinder tourists from appreciating and experiencing the destination and trip fully.

There are some implications. First of all, in terms of theoretical implications, this study attempted to link between the addiction to social media and compulsive behaviours within the context of tourism. By providing some meaningful results that social media overuse negatively influence tourist experiences and other outcomes such as satisfaction and memory, this study offers new insights to the researchers in tourism IT field. With regard to managerial implications, the present study provides destination marketers with an important starting point for how to design their destinations and attractions alleviating the impact of social media use. In other words, it is possible for tourist not to use on social media compulsively by offering all necessary information to them or installing some events that tourists can

and want to participate in on the site. The study on the negative effects of social media usage is still in its early stages. Furthermore, some researchers regard photo-taking during the trip as the way to improve the memory of the trip. Thus, future studies should examine the effects of some specific compulsive behaviours during the trip on the memory.

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Customer Engagement in Facebook Brand Communities: Measurement and Best Practices from the Airline Industry

Vu Thi Thao, Thomas Wozniak and Andreas Liebrich

Abstract This paper explores customer engagement in online brand communities and identifies best practices to enhance customer engagement in social media marketing contexts. Drawing on a case study of 30 full service network carrier Facebook communities, the findings demonstrate that customer engagement levels of a majority of these airlines are low, i.e. customers are only marginally or passively engaged. The findings also highlight distinct patterns of customer engagement behaviour among the top three airlines, whose customers are highly engaged. Through proposing a customer engagement measurement framework, this paper contributes to methods of measuring the effectiveness of social media marketing efforts. It suggests that one of the best ways to motivate customers to engage with brands is to create a good mix of marketing content that includes: relevant brand-focus information, entertainment, awards, and tips.

Keywords Social media · Customer engagement · Online brand community · Airlines · Facebook

1 Introduction

With the evolution of Web 2.0, social media has grown at a tremendous pace over the past decade. Social media allows users to create and exchange information, thus it has gained massive popularity among Internet users (Horn et al., 2015). For example, Facebook, the largest social network site, has 1.71 billion monthly active users (Facebook, 2016). In the hospitality industry, consumers heavily value

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first-hand information from peers (Murphy, Moscardo, & Benckendorff, 2007), as they cannot test or experience products prior to purchase (Schmallegger & Carson, 2008). Numerous studies show that electronic word-of-mouth (eWOM) influences booking intentions, and customer trust in brands (e.g. Ladhari & Michaud, 2015). Social media therefore "presents a golden opportunity for the hospitality industry to make greater contact with its customers", to promote brands, and to increase sales (Withiam, 2011, p. 5).

Many hospitality firms have integrated social media into marketing. However, they still struggle to measure the effectiveness of social media marketing and to determine how to best exploit its potential benefits. These questions receive much attention from academics as well. In spite of many debates, there is no agreement on these issues to date. Some argue that Return on Investment is a good performance indicator to measure the effectiveness of social media marketing (Hoffman & Fodor, 2010). Others claim that Return on Influence or Return on Engagement are more appropriate performance measures (Fisher, 2009). Nevertheless, both schools of thought agree that the value creation of social media marketing lies in: engaged customers. Despite great efforts of consulting companies, advertising research agencies, and marketing academics to conceptualize and measure customer engagement (CE), this research area is still evolving. Thus, there is a need for more theoretical as well as empirical studies (Hollebeek, Conduit, & Brodie, 2016; Pansari & Kumar, 2016).

This paper aims to explore CE in online brand communities (OBCs) and to identify best practices to enhance CE in social media marketing contexts. The analysis is drawn on a case study of 30 airline Facebook communities. Since the airline industry is one of early adopters of social media (Mistilis, Agnes, & Presbury, 2004), it is anticipated that this case study should provide valuable lessons learnt for the hospitality industry. Furthermore, most empirical studies on CE look at CE either from customer (e.g. Brodie, Ilic, Juric, & Hollebeek, 2013; Dessart, Veloutsou, & Morgan-Thomas, 2015; Gummerus, Liljander, Weman, & Pihlström, 2012) or brand perspectives (e.g. de Vries, Gensler, & Leeflang, 2012). This paper examines CE from both a lens of customers and brands, whose interactions are central to CE, thereby providing more insightful findings on CE.

2 Literature Review

2.1 Customer Engagement in Online Brand Communities

The concept of "customer engagement" (CE) has emerged only 10 years ago. Despite its growing popularity, the conceptualization of CE is still in the early stages of development. To date, there is no universal definition. A few scholars have attempted to conceptualize CE (Dessart et al., 2015). Notably, Brodie et al. (2011) theorize CE from a relationship marketing perspective and a service-dominant logic. These theoretical roots of CE have been quickly adopted by

other authors (e.g. Dessart et al., 2015). In contrast to traditional and transactional views of marketing relationships, a service-dominant logic underlines customer interactions, co-creative experiences with other actors, including service personnel, firms, and/or other customers (Vargo & Lusch, 2008). Hence, CE goes beyond transactional behaviour. To ensure long-term competitive advantage, firms need to retain, sustain, and boost levels of CE (van Doorn et al., 2010). CE is often treated as a multidimensional concept, consisting of cognitive, emotional, and/or behavioural dimensions (Brodie et al., 2013). It is also treated as a unidimensional (mostly behavioural) concept (van Doorn et al., 2010).

Social media, specifically social network sites, have enabled new forms of customer-brand interactions. Geographically dispersed consumers who share common interests increasingly gather in virtual environments to engage with brands, in so-called OBCs. Dessart et al. (2015) define OBC as "a grouping of individuals sharing a mutual interest in a brand, using electronic mediation to overcome real-life time and space limitations" (p. 32). The focal object of OBCs is the brand itself (Brodie et al., 2013; Wirtz, Ramaseshan, Klundert, Canli, & Kandampully, 2013). OBCs have similar characteristics as offline brand communities, such as a common consciousness, shared rituals and traditions, and moral responsibility (Muniz & O'Guinn, 2001). However, OBCs also have distinct differences from offline brand communities. According to Wirtz et al. (2013), members can use virtual identity or anonymity. Furthermore, costs are low to join and be a part of the community, thus resulting in a wider level of CE.

The process of how CE works in OBCs follows three main steps (Fig. 1): (1) certain triggers initiate customers to join the brand (e.g. customers may engage with an OBC due to previous positive experiences, such as existing brand knowledge and connection, loyalty, satisfaction, and trust); (2) customers then interact with peers and the brand via the interplay of five sub-processes: sharing, co-developing, socializing, advocating, and learning; (3) outcomes of such interactions may increase satisfaction, loyalty, commitment, and trust, which can subsequently motivate customers to engage more with the brand. The CE process does not necessarily follow sequential progression over time because customers can disengage or terminate their relationship with OBCs at any specific point in time. Moreover, those customers who have been actively engaged can be inactive or passive for some time (Brodie et al., 2013).

2.2 *Customer Engagement Measurement in Social Media Marketing*

Frameworks for measuring CE in social media are predominantly driven by quantitative measurement (Hoffman & Fodor, 2010). Yet the essence of CE is customer experience, which is "subjective, qualitative, personal, memorable, and often emotional" (Calder, Isaac, & Malthouse, 2013, p. 5). This requires qualitative measurement rather than quantitative metrics (Fisher, 2009).

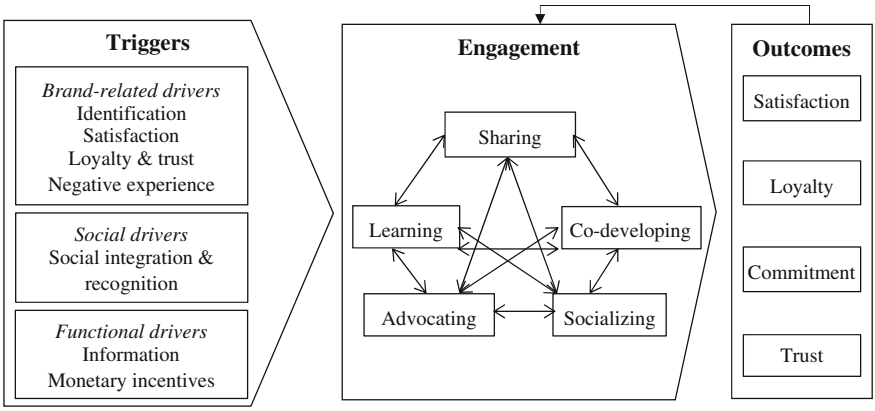

Fig. 1 CE process in an online brand community (compiled from Wirtz et al., 2013; Dessart et al., 2015; Brodie et al., 2013)

Drawing on relevant social media marketing discourses, the current authors develop and propose a CE measurement framework within the context of OBCs (Table 1). Behavioural dimensions of CE can be measured through scope and intensity of interaction/involvement forms, such as number of clicks (Fisher, 2009; Hoffman & Fodor, 2010; Murdough, 2009). The magnitude of cognitive and emotional dimensions of CE can be assessed via motivations and sentiments, which are evaluated via qualitative indicators. For instance, what do customers say? How are the tones of their conversations? What factors have driven them to interact with peers and/or with brands? As the nature of CE is context-dependent and specific levels of CE may be moderated by specific individual-level and/or contextual variables (Brodie et al., 2011), it is necessary to consider brand interactions with customers (e.g. engagement invitation, announcement). By doing so, brands can influence topics being discussed and attitudes toward brands (Murdough, 2009), thereby leveraging CE levels. Subsequently, through the measurement and assessment of CE dimensions, CE levels can reflect particular interactive customer experiences with brands.

Although both quantitative and qualitative measurements are taken into consideration, CE metrics presented in Table 1 are not exhaustive. Nevertheless, they are ideal cases. In practice, some measurement indicators might be difficult to gain access to.

2.3 *Customer Engagement in Social Media in Travel, Tourism, and Hospitality*

Conducting a meta-analysis on social media in travel, tourism and hospitality, Leung, Law, van Hoof, and Buhalis (2013) acknowledge the potential of social

Table 1 CE metrics for social media marketing (compiled from Fisher, 2009; Hoffman & Fodor, 2010; Murdough, 2009)

CE Dimensions	Indicators	Examples for social network sites (e.g. Facebook)
Behavioural	• Scope and intensity of interaction/involvement forms, i.e. sharing, co-developing, socializing, advocating, and learning	• No. of members/active users/fans • No. of comments • No. of views • No. of user-generated items, e.g. photos, replies • No. of posts on wall • No. of reposts/shares • No. of responses to friend referral invites
Cognitive and Emotional	• Tone/sentiment • Motivations	• No. of emoji reactions, e.g. "like" • Motivations • Attitudes and opinions • Topics discussed

media in facilitating firms to engage customers. Likewise, Cabiddu, Carlo, and Piccoli (2014) claim that social media allows hotels to maintain relationships with customers, even when guests are not physically present at their properties. Hotels can learn about customers, such as their profiles, reviews, preferences, and network relationships to personalize organizational communications and services, which can enhance the depth of hotel-guest interactions. On the contrary, a study on the marketing performance of 67 hotels in Hong Kong, Chan and Guillet (2011) concluded that hotels largely have a poor performance in using social media to engage with customers and miss opportunities to learn about customer behaviour. Although a majority of them created OBCs, however, they did not truly understand the fundamental idea behind the creation of OBCs, which is to facilitate brand-customer interactions. Hence, they fail to fully engage customers. The common strategy of those hotels analysed was regular updated contents to retain customers on their OBCs. They rarely initiated or actively participated in the community discussions. Most of the hotels used social media as another channel for promotions.

Similarly, airlines adopt social media mainly as promotional channels. Some airlines even integrate booking applications into OBCs (Grančay, 2014; Leung, Schuckert, & Yeung, 2013). However, social media marketing strategies used by airlines are far from uniform (Hvass & Munar, 2012). In a Facebook community study that involved 250 of the largest airlines (by number of passengers), Grančay (2014) reported that nearly three quarters of the airlines adopted a fully bi-directional communication, meaning they respond to customer posts and

encourage customers to interact with peers. One quarter of the airlines chose a one-way communication style, from the airline direct to the public. These customers are treated as passive participants who are not allowed to create contents. A small number of airlines operated an unmonitored bi-directional communication strategy, which provided space for customers to interact with peers, but did not respond to customer posts. No response to customer posts tends to create negative comments. Airlines that responded to customer's posts are more likely to have more number of fans and "likes". However, conducting a study of three budget airlines Facebook pages, Leung, Schuckert, and Yeung (2013) claimed that whether airlines respond to customer's posts or not has no influence on CE. Instead, they suggest that the freshness of posts plays an important role in maintaining and increasing CE.

3 Methodology

This study adopted netnography, an adapted form of ethnography (Kozinets, 2010), to observe behaviours of airlines and customers, and interactions between them in airline Facebook communities. Netnography has been widely adopted in studying online communities in the field of social media marketing and consumer research (e.g. see Brodie et al., 2013; Hvass & Munar, 2012). It possesses fundamental characteristics of ethnography and is conducted online by using text and information, which are publicly available on existing online communities (Kozinets, 2010).

Facebook was chosen because it is the largest social network site (Facebook, 2016; Kemp, 2016) and firms consider it the most attractive social media platform for marketing (Nielsen Media Research, 2012). Only international and official airline Facebook pages were taken into consideration. The top 30 full service network carriers ranked by Skytrax (2015) were selected for following reasons. Full service network carriers have a much larger market share than low-cost carriers (Capa Center for Aviation, 2013). They are also more likely to have a greater amount of available resources for innovative social media marketing practices (Hvass & Munar, 2012), thus helping to identify best practices of CE. The selection of 30 airlines did not take into account the geographical aspect. This is because customers face minor constraints in terms of geographical time and space in joining airlines Facebook communities. Moreover, airlines operate internationally and follow global standards.

Data was collected in two stages. First, quantitative data on the number of comments, views, and shares of posts as well as the number of emoji reactions to posts ("like", "love", "wow", "haha", "angry", and "sad") were counted and collected on each day during a 7-day observation period. The number of fans was recorded on the last day of the quantitative data collection (28/3/2016). This data was gathered to measure CE levels of the 30 selected airlines. Behavioural dimensions of CE were measured by magnitude (i.e. number of fans) and intensity of interactions between customers with airlines and peers (i.e. sum of number of

Table 2 Measurement and ranking of CE levels

Magnitude, intensity, positive emotion		Negative emotion (*)	CE levels	
High	4	1	14–16	Highly engaged
Medium	3	2	11–13	Engaged
Low	2	3	8–10	Marginally engaged
Very low	1	4	4–7	Passively engaged

(*)Higher levels of negative emotion are given low values because the ultimate goal of airlines is to have positive relations with customers

Table 3 CE levels of airline Facebook communities

Airlines	Magnitude	Intensity	Positive emotion	Negative emotion	CE levels
1. KLM	High (4)	High (4)	High (4)	Low (3)	Highly engaged (15)
2. Emirates	Medium (3)	High (4)	High (4)	Low (3)	Highly engaged (14)
3. Qatar Airways	High (4)	Medium (3)	Medium (3)	Very low (4)	Highly engaged (14)
4. Air New Zealand	Low (2)	High (4)	Low (2)	Very low (4)	Engaged (12)
5. Singapore Airlines	Low (2)	Medium (3)	Medium (3)	Low (3)	Engaged (11)
6. Japan Airlines	Low (2)	Very low (1)	High (4)	Very low (4)	Engaged (11)

comments, views, and shares). Positive emotional dimensions of CE were measured by the number of "like", "love", "wow", and "haha". Negative emotional dimensions of CE were measured by the number of "angry" and "sad". Based on the results of these measurements, each dimension was ranked and assigned a corresponding value. CE levels were calculated and ranked based on the sum of each dimension (Table 2).

Due to space limitation, Table 3 presents CE levels of the top 6 performing airline Facebook communities.

The outcome of stage one was then used to select the top three performing airlines with the highest level of CE for stage two, which observed how customers interact with these airlines and peers. During a 5-day observation period, all communications that took place in the airlines' Facebook communities were directly copied and downloaded. Content analysis was adopted for data analysis. Following suggestions by Bryman and Bell (2011), a dictionary was composed with definitions and rules to instruct how text is coded. For instance, social integration is referred to an act of participating or joining a conversation, in which expression is neutral. Questions and answers on cancellations, baggage, refunds, etc. were coded as customer services.

4 Results

The following sections discuss the results of the data collected in stage two.

4.1 Customer-Airline Interactions

This section first demonstrates how customers engage with peers and the airlines. These interactions are initiated by customers. It then shows how the airlines respond to customer engagement behaviour. The ways in which customers interact with the airlines influence the airlines' form of interaction with customers and vice versa.

Customer Engagement Focus. Table 4 documents patterns of CE behaviour in Facebook communities of KLM, Emirates, and Qatar Airways. These patterns result from an analysis of 4,102 pieces of user-generated content in form of posts/messages. The most common CE behaviour is social integration (37.5%). This suggests that customers participate in airline online communities to socialize with peers and brands.

Likewise, customers mainly engage in airline online communities to gain social recognition, which represents more than one third of total interactions (32.1%). Many customers made known their experiences to airlines and peers. For instance, customers typically responded to KLM's post "Sint Maarten in slow motion" as: "Been there, done this, many times!". They might do so in order to enhance their social status in the virtual social circle.

More than 18% of total interactions are to share positive eWOM. Customers also engage in airline Facebook communities to express their bad experience. Yet, this CE behaviour is found less frequent than sharing positive eWOM. Customers also participate in airline Facebook communities for customer service, which accounts for 4.5% of total interactions. Knowledge sharing, entertainment, and advertising personal business are other motivational drivers that trigger customers to engage with airline Facebook communities (2.1%).

Many more interactions occurred in KLM's and Emirates' Facebook communities in comparison to Qatar Airways' Facebook community. Differences also exist in patterns of CE behaviour amongst the three airlines. Customers engage with KLM Facebook community predominantly for social integration, while customers

Table 4 CE behaviour patterns

Airlines	Customer service (%)	Social integration (%)	Social recognition (%)	Positive eWOM (%)	Negative eWOM (%)	Others (%)	Total (count)
KLM	7.5	64.0	12.7	10.7	3.7	1.4	1881
Emirates	0.8	14.5	56.5	21.8	3.7	2.7	1884
Qatar Airways	7.1	18.1	4.2	45.1	22.5	3.0	337
Total	*4.5*	*37.5*	*32.1*	*18.6*	*5.2*	*2.1*	*4102*

Table 5 Airline engagement behaviour

Airlines	Customer service	Customer entertainment and purchase encouragement	Total (count)
KLM	209 (85.0%)	37 (15.0%)	246
Emirates	0 (0%)	0 (0%)	0
Qatar Airways	26 (100%)	0 (0%)	26
Total	235 (86.4%)	37 (14.6%)	272

of the two other airlines socialized considerably less in these airline Facebook communities. Emirates' customers mainly interact with peers to gain social recognition. Qatar Airways' customers mostly join the airline's Facebook community to share experiences, both positive and negative eWOM. The differentiating CE behaviour can be explained by the airlines' different social media marketing strategies.

Airline Engagement Focus. Table 5 illustrates different social media marketing strategies of the three airlines. KLM adopts a fully bi-directional communication strategy. The airline actively engages with customers. They extensively use Facebook as another channel for customer service. Yet, they respond to all kinds of communications from customers in a personal and open language. They explicitly encourage customers to share experiences, even bad ones. Furthermore, they "typically reply within an hour".

Entertaining customers and encouraging purchases are another important activity that KLM pursues in interacting with customers. As a majority of customers engage with airlines and peers in search for social integration and recognition, the airline attempts to build their online community in such a way that would satisfy these customer needs. They encourage customers to share pictures and stories of their flights and travel, which makes customers feel as if they are being appreciated. Evidently, this explains why customers mainly socialize on KLM's Facebook community.

Similar to traditional media, the ultimate goal of social media marketing efforts is to increase sales. In their interactions with customers, KLM leverages the opportunity to encourage customers to fly with the airline. For example, a customer was inspired by KLM's video of "Sint Maarten landing in slow motion", he then expressed a desire to travel to Sint Maarten island. KLM enthusiastically responded to the customer to increase the desire to book a flight.

In contrast, the two Middle Eastern airlines follow an unmonitored, bi-directional communication strategy. Except for publishing regular posts, they modestly interact with customers. Emirates especially have no interactions with customers. Customers are allowed to add content to Emirates Facebook community, but the airline does not respond to customers' posts. Qatar Airways seldom answer customer questions. They only respond to complaints, which are considered to impact their brand image or if they are under pressure from community members that demand a response.

The most important engagement activity of all three airlines is to create marketing content for customers. On average, the airlines share one wall post per day. To encourage customers to stay and engage in the Facebook communities, the airlines focus on two types of marketing content: *brand-focus* and *entertainment*. They provide relevant brand information, such as new aircrafts, new routes, or new destinations. The two Middle Eastern Airlines seem to be more in favour of using brand-focus information to interact with customers. Entertainment content is also used often by the airlines and is usually integrated with some sort of brand information. For instance, five out of 6 wall posts of KLM are about entertainment information. All three airlines also use other types of marketing content, such as award announcements, travel tips, advertisements, and integrated personal story into brand stories to communicate with customers.

Content in visual forms is strongly dominant in all the airlines' wall posts, especially photos. Photos are present in 9 out of 16 wall posts. They are usually accompanied by a short heading. Videos are also used quite often by the airlines. Content in text form is rarely used alone, but is more so prevalent combined with photos.

4.2 Best Practices in Enhancing Customer Engagement

This section presents four best examples of how wall posts engendered highly engaged customers. The selection of best examples is based on wall posts, which generate highest magnitude, intensity, and positive emotional level of CE. Three of the best examples are from KLM and one from Emirates.

Table 6 presents details of popular wall posts. These wall posts share some common characteristics, which may explain why they elicited high CE. First, they contain a clear, simple, and short message. The post's length does not exceed more

Table 6 Popular wall posts

Airlines	Wall post	Content form
KLM	*Sint Maarten landing in slow motion.* 1.8 million views, 12,000 shares, 3,141 comments 65,812 likes, 2,886 loves, 1,693 haha, 97 wow, 2 sad, 2 angry	Video (44 s)
	Fly & Drive:-) 2,595 shares, 668 comments 68,788 likes, 860 loves, 830 haha, 71 wow, 7 sad, 5 angry	Photo
	Where is our Boeing going? 46,000 views, 243 shares, 685 comments 28,862 likes, 77 loves, 19 haha, 6 wow, 1 sad, 1 angry	Video (7 s)
Emirates	*When is your next Emirates flight?* 1,194 shares, 1,792 comments 23,620 likes, 768 loves, 23 haha, 199 wow, 6 sad, 2 angry	Photo

than 6 words. Second, they are all in visual form. The length of videos is incredibly short, less than half a minute. Third, these posts have entertainment-focus content. This kind of content is well suited to CE behaviour of socialization. Also, two out of four wall posts are in a simple question form. For example, "Where is our Boeing going?" is a simple quiz, showing a 7-second video with a flight route map. It is rather easy to find a solution to such questions. This type of content not only serves to provide information for customers to consume and contribute content, but also to satisfy customers' need for social recognition. It elicits customers to interact with peers, have fun, and feel knowledgeable. Fourth, all the wall posts incorporate relevant brand information, with some hints about the brands' products. For instance, "Fly & Drive ☺" is about KLM's cargo service. Finally, all of these wall posts are about flights that meet fans' interests in travel.

5 Discussion and Conclusion

The CE levels of a majority of 30 full-service airlines were ranked as marginally or passively engaged. Their customers are either somewhat behaviourally and emotionally engaged, or just passive members. The online community members seldom interact with peers and/or airlines. KLM, Emirates, and Qatar Airways are the only three airlines whose CE level ranked as highly engaged. Through proposing and using a CE measurement framework, this study contributes to methods of measuring the effectiveness of social media marketing efforts.

The findings highlight that customers typically engage in airline Facebook communities for social integration and social recognition. Conducting a survey of 2,000 consumers, Hennig-Thurau, Gwinner, Walsh, and Gremler (2004) also find that social benefits strongly influence customer motivation in participating in OBCs. Distinct patterns of CE behaviour are existent among the top three airlines, which can be explained by the airlines' different social media marketing strategies. KLM adopts a fully bi-directional communication strategy, whereas the two Middle Eastern airlines follow an unmonitored, bi-directional communication strategy. One common practice, which all three airlines adopt, is that they frequently publish posts that contain typically brand-focused and entertainment information.

Besides helping marketers to understand CE behaviour, the findings of this study have several managerial implications for the travel and hospitality industry. To enhance CE levels, the following five points seem to be crucial:

- *A good mix of marketing contents with relevant brand-focus information, entertainment, awards, and tips make brand pages more vibrant to customers.* Entertainment, awards, and tips, etc. should be related to brand products, services or the industry in which the brand operates. This kind of "lifestyle" brand community meets customer motivations in participating in OBCs, thus triggering them to actively engage with brands and ensuring long-term CE. In a

Zara Facebook community study, Gamboa and Goncalves (2014) also suggest that content relevance to the brand is central to increase CE.

- *Communicating with customers regularly, but at a modest frequency, ideally one wall post per day.* This helps to maintain regular relationship with customers, and increases the chance of capturing customer attention.
- *Expressions through photos helps to communicate quickly and easily* as a majority of customers are not willing to spend more than 1 min to read or view brand posts. A study of 98 global brands also recommends that Facebook wall posts should contain photos to help generate high levels of CE (Malhotra, Kubowicz Malhotra, & See, 2013).
- *Brand posts should contain entertainment-focus content and a hint of the brand's product, thereby eliciting stronger CE.* For example, an easy quiz or a question, which creates a little challenge for customers to solve, can satisfy customer needs' for seeking social recognition. This can boost CE levels significantly.
- *Speed of response, openness, and personal tone are also crucial in enhancing CE.* This can be seen in KLM's case whose customers are highly engaged.

The findings of this study were drawn upon available data in social network sites, which is subject to bias because airlines can monitor and remove certain posts. The study focuses on an online community sample. This makes it difficult to generalize results to the offline community population.

The findings raise some interesting questions for future research. For example, Emirates adopt an unmonitored, bi-directional communication strategy, while KLM uses a fully bi-directional communication strategy. Nevertheless, customers in the Emirates Facebook community are also highly engaged. Emirates also received almost as much positive eWOM as KLM did. What are the underlying reasons for Emirates' success? Is this due to their high service quality? Is this high level of CE in OBC influenced by traditional media marketing? Moreover, rapid responses and responding to all customer messages may create risks for firms that fail to fulfil these promises, which can in turn make customers unsatisfied (Caliesch & Liebrich, 2011). Which marketing strategy, KLM's or Emirates' strategy, is more effective in achieving and maintaining a high level of CE?

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Influence of Social Media on Corporate Heritage Tourism Brand

Dandison Ukpabi and Heikki Karjaluoto

Abstract Heritage tourism is an established research canon. However, corporate heritage tourism is an emerging research stream that integrates the heritage tourism canon and corporate brand attributes. This study, utilising a conceptual approach and proposing a conceptual model, explicates the role of social media (marketer and consumer-generated media) in fostering a sense of community among the corporate heritage tourism brand adherents and visit intention among members of the community. In addition, this study incorporates social identity theory to dilate group dynamics and to foster strong feelings and sense of identity among its community.

Keywords Corporate brand · Heritage tourism · Social media

1 Introduction

Scholars' attention to explicating the evolutionary process of corporate brands has underscored its importance (Pitt, Watson, Berthon, Wynn, & Zinkhan, 2006; Rindell & Strandvik, 2010). The corporate heritage brand research stream has emerged to unravel the relevance of the organisations' past and contemporary concerns in order to influence future generalisations (Balmer & Burghausen, 2015). The corporate heritage literature is concerned with existing institutions having an enduring meaningful heritage and not those that are gone (Balmer & Chen, 2016). The evolution of corporate brand has been proposed to include both closed source and open source (Pitt et al., 2006). Pitt et al. (2006) argue that the closed source perspective rests the power and control of the brand on management, whereas the open source argument recognises the consumer as a co-constructor and producer of corporate brand. In this argument, the consumer is no longer the passive recipient of

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marketing messages but rather is very active in controlling and co-building corporate brand (Rindell & Strandvik, 2010).

More recently, the corporate heritage brand research stream has been applied in tourism literature (Balmer & Chen, 2016). However, heritage tourism literature has been an established research canon (Poria, Butler, & Airey, 2003). Heritage tourism research mostly relates to historical events and also evokes feelings of the present and a connection to traditional entities and national identity (Park, 2010; Balmer & Chen, 2016). Specifically, many tourism sites hold cultural, philosophical, and socio-psychological remnants that signify important and nostalgic events in the past, educational opportunities in the present and guides in the future. Metaphorically, heritage is not just the tangible elements represented by sites and artefacts but also the intangible elements that embody symbolic and spiritual meanings grounded in the material representation of the past (Park, 2010). The heritage industry is divided along the cultural, natural and built elements (Poria et al., 2003).

According to Balmer and Chen (2016), corporate heritage tourism brand is the blend of corporate heritage brand and heritage tourism. Thus, as corporate brands, can be 'tourism attractions in their own right' (Balmer & Chen, 2016, p. 3). They bear cultural identities which resonate with the historical progression of the people. Their attractiveness to domestic and foreign visitors is anchored on its long-endured and living identities. Technically, they espouse the attributes of a destination brand, because, for instance, they have unique identities that differentiate them; however, not all destination brands qualify as corporate heritage tourism brands. In line with Balmer and Chen's (2016) argument, they are single tourism attraction, for instance, Tong Ren Tang, a Chinese traditional medicine shop founded in 1669.

Social media presents a solid platform for individuals to share content related to their feelings in the form of photos, videos and text. The feelings of social and cultural connection tie people to a community, and such a community can be enhanced through social media (Balmer & Burghausen, 2015). Similarly, social identity theory (Tajfel & Turner, 1979) proposes that an individual's sense of self-worth is based on the group he or she belongs. An individual with a positive sense of social identity takes pride and derives self-esteem in the group. Consequently, social identity plays an important role in fostering community cohesiveness. Furthermore, the desire to advance the brand can metamorphose into we-intention. We-intention, according to Tuomela (1995, p. 9), is a "commitment of an individual to engage in joint action and involves an implicit or explicit agreement between the participants to engage in that joint action." Thus, corporate heritage tourism brand adherents can be cohesively united through the sense of social identity and social media foster we-intention whereby share, connect and advance the brand. In this study, the concepts of "corporate heritage tourism brand", "site" and "destination" are used to represent the services or offerings that influence consumers' visits.

However, although substantial efforts have been variously made in explicating corporate heritage, corporate heritage brand, and corporate heritage tourism brand (Balmer & Burghausen, 2015; Rindell & Strandvik, 2010; Balmer & Chen, 2016), knowledge is still scarce on the contributions of social media (marketer and consumer-generated media) on corporate heritage tourism brands. In addition,

existing literature does not clarify how marketer- and consumer-generated media influence visit intention to a corporate heritage tourism brand. Finally, Balmer and Chen (2016) called for a study to incorporate social identity theory in the corporate heritage tourism brand literature. Therefore, conceptually, the objectives of this study are as follows:

- extend the corporate heritage tourism literature using the social identity theory;
- explain how marketer-generated media influence intention to visit a corporate heritage tourism site; and
- explain how consumer-generated media influence intention to visit a corporate heritage tourism site.

2 The Corporate Brand

Within the broad stream of the branding literature, the product brand and the corporate brand appear synonymous but are actually different (Balmer & Burghausen, 2015). At the product brand level, consumers' perceptions of the brand are influenced by the brand identity and brand image. Aaker (1996, p. 68) defines brand identity as 'a unique set of brand associations that the brand strategist aspires to create or maintain', whereas brand image 'is how a brand is perceived by consumers' (p. 71). Time, memories and associations influence the brand image (Rindell & Iglesias, 2014). To this end, the concept of brand heritage captures how these elements aggregate to form the consumer's perception of the brand. Urde, Greyser, and Balmer (2007, p. 4) define brand heritage as 'a dimension of a brand's identity, found in its track record, longevity, core value, use of symbols and particularly in its organisational belief that its history is important.' As a result, the past and future influence the present brand strategies, practices and identity construction (Rindell & Iglesias, 2014; Balmer & Burghausen, 2015).

Corporate brands develop out of corporate identities. According to Balmer (2012, p. 1072), 'corporate identity refers to an organisation's distinguishing identity features, and a corporate brand identity is associated with the associations and expectations linked to a corporate brand name and or marque etc.' Corporate brands are considered as monetary assets and a way of building trust and stability in a turbulent and competitive market (Rindell & Strandvik, 2010). Contrasting extant studies on corporate brand image, Rindell and Strandvik (2010) argue that the concepts of image-in-use and image heritage have totally redefined corporate brand evolution. They posit that given consumers' everyday interactions with multiple sources, brand images change over time in the minds of consumers. According to the authors, image heritage comprises the individual consumer's prior company-related experiences arising from interactions with others on different platforms. Image-in-use refers to the value derived in the consumption context. The open source view of the brand image acknowledges the fact that the perception of the brand is influenced by everything consumers consider relevant to it (Rindell & Iglesias, 2014).

3 Corporate Heritage

Heritage as a concept has been used in different contexts. In disciplinary terms, heritage occupies a prominent research stream in tourism, sociology and marketing (Balmer & Chen, 2016). Heritage applies to the tangible, intangible and metaphysical (Balmer, 2013). However, much of the academic discourse on heritage discusses it from a narrow prism on the built environment and visitor attractions (museums and sites) (Balmer, 2011a, b). Balmer (2013, p. 296) contends that 'corporate heritage institutions have living, durable but also—importantly—adaptable corporate identity traits.'

From the above understanding, Balmer and Burghausen (2015) posit that corporate heritage represents some aspects of the firm's past that are still relevant in light of contemporary concerns and that are worth preserving for future generations. For an institution to qualify as having a corporate heritage, Balmer (2013) argues that it must possess the following criteria:

- Omni-temporality
- Institution trait consistency
- External/internal tri-generational hereditary
- Augmented role identities
- Ceaseless multigenerational stakeholder utility
- Unrelenting management tenacity

Corporate heritage identity comprises the artefacts, competencies, philosophies, etc. that existed in the past, that are relevant in the present and that will be meaningful in the future. Consequently, the time element is an important determinant of a corporate heritage identity.

4 Heritage Tourism and Corporate Heritage Tourism

Heritage is culturally ingrained, a representation of a people's nationhood, epitomising identities, ethnicities and nationalities (Park, 2010). Heritage has evolved from the appellation of the cognitive dimensions such as 'implicating castles, plantation great homes, battlefields, old churches' as important cultural identities of a people to the affective dimensions such as the feelings and sense of connection to such cultural emblematisations (Weaver, 2011, p. 249). Heritage tourism has been an established research canon in the tourism literature (Poria et al., 2003). According to Chhabra (2010, p. 5), heritage tourism is defined as 'a phenomenon that focuses on the management of past, inheritance, and authenticity to enhance participation and satisfy consumer motivations by evoking nostalgic emotions; its underlying purpose is to stimulate monetary benefits for its various constituencies such as the museums, historic houses, festivals, heritage hotels, and other stakeholders.' Additionally, heritage tourism has been limited to the cultural, natural or

built elements, with two main identified approaches to its study (Poria et al., 2003). One approach regards heritage tourism as historic places, in which case 'the presence of tourists is sufficient.' The second approach links the content of a place to the phenomenon, in which case motivations and experiences are underlying reasons for the trip.

Established also in tourism literature is the concept of destination brands. Morrison and Anderson (2002) posit that destination brands consist of the unique identities that differentiate a destination from others. Customers' perception of a destination is based on the evaluative and cognitive judgements they hold about that destination. Consequently, managers' effort in destination branding is to combine all the elements of a destination to give it a unique image from competing destinations (Morrison & Anderson, 2002). However, Balmer's (2013) conceptualization of corporate heritage tourism brand consists of single tourism attractions; focuses on 'living' rather than 'defunct' heritage institutions. Moreover, it unifies traditionally held heritage tourism (Park, 2010) with corporate heritage espousals (Balmer, 2011a, b, 2013). Thus, corporate heritage tourism blends heritage institutions/brands and through their origins and meanings attract tourists/customers (Balmer, 2013).

5 Social Identity Theory

Social identity theory was developed by Tajfel and Turner (1979). It establishes the position of an individual as belonging to a social group. It holds that an individual's self-concept includes both his personal identity (the 'I') and the social group in which he or she belongs (the 'We'). The individual's sense of self is based on social categories that define him or her. An individual with a high level of social identity positively distinguishes her- or himself from other groups and has the tendency to identify with the group that provides him or her with a positive self-image. The theory also assumes that the individual's definition of self-worth is evaluated based on the community to which he or she belongs and involves cognitive, affective and evaluative components (Dholakia, Bagozzi, & Pearo, 2004). In the cognitive sense, social identity is evident in the categorization processes. In this case, the individual spends time thinking about being a member of the community and also assesses similarities and dissimilarities with members and non-members, respectively (Dholakia et al., 2004). One central postulation of the cognitive social identity theory is depersonalization (Stets & Burke, 2000). Stets and Burke (2000) argue that depersonalization involves seeing oneself as an embodiment of the in-group rather than as a unique individual. Thus, the norms and meanings of the group membership are internalized and acted upon in accordance with those norms and a distinct perception of dissimilarities with outer-groups.

In the affective sense, social identity implies positive feelings towards being a member of the group and emotional involvement in the group's activities (Dholakia et al., 2004). Allen and Meyer (1996, p. 253) define affective commitment to the

group as 'identification with, involvement in, and emotional attachment to the organisation.' Affective commitment is underpinned by two cardinal emotional prototypes: joy and love (Bergami & Bagozzi 2000). According to Bergami and Bagozzi (2000, p. 560), joy entails 'happiness arising from the organisation as a social category' whereas love consists of 'emotional attraction or affection towards the organisation as a social category'. Finally, the evaluative component of social identity implies the perception of similarity and bond with others in the community and the individual's evaluation of self-worth as a member of the group (Dholakia et al., 2004).

Consistent with the above, the nostalgic feelings and sense of identity that a corporate heritage tourism brand evokes (Park, 2010) among its community fosters strong we-intentions (Dholakia et al., 2004). Thus, according to Poria et al. (2003) motivations for visit are strongly underpinned by the tourists' perceptions of such brands as their own heritage. As a result, commitment to the brand can also trigger a socio-psychological switching from outer-group members to the brand (Lam, Aheame, & Schillewaert, 2010) and intention to visit. Consequently, Fig. 1 is the conceptual framework, derived on the strength of the literature and discussion above. It implies that social identity theory and that social media foster strong we-intentions which influence visit intentions to a corporate heritage tourism brand.

However, a review of the literature on the application of social identity theory to online social networks reveals an acute paucity of the theory's use in tourism. Thus, Table 1 presents some of the studies and the context in which social identity theory was studied in online social networks.

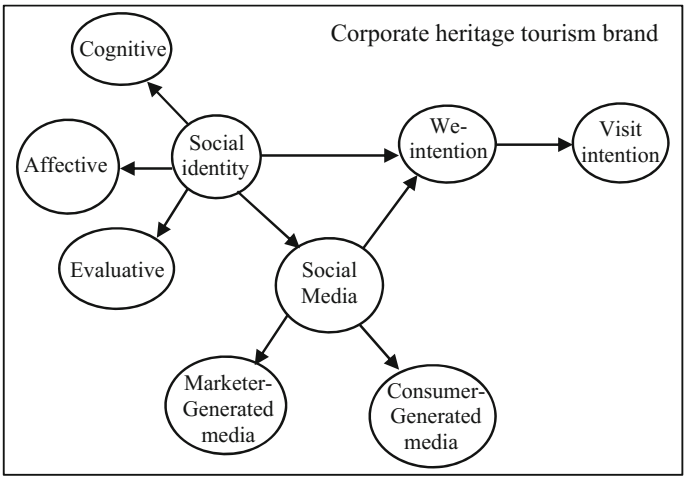

Fig. 1 Conceptual framework

Table 1 Previous research on social identity theory to online social networks

Author	Purpose	Context	Independent variables	Dependent variable(s)	Results
Cheung and Lee (2010)	To develop and test a model on intentional social action on online social network	Facebook users	Subjective norm, group norm, social identity (cognitive, affective, evaluative	We-intentions	Social identity and subjective norm determine collective intention to use social networking site
Mehra, Kilduff, and Brass (1998)	To examine the extent to which membership in demographic group influence social identification and interaction patterns	MBA students	Friendship network, homophily, sex, race	Identity network	A small group in a social context uses that group as a basis for shared identity and social interaction
Shen, Yu, and Khalifa (2010)	To test a model that integrates social identity and social presence in virtual communities	Virtual community	Sensory social presence, affective social presence, cognitive social presence	Knowledge contribution, social identity	Both affective and cognitive social presence contributed to social identity in virtual communities
Barker (2009)	To assess the motives for social network sites, group belonging and collective self-esteem and gender effect among older adolescents	Freshmen students	Entertainment, social compensation, positive collective esteem, negative collective esteem	Peer group contact	Those high in collective self-esteem have high motivation to communicate through social network site
Casalo, Flavian, and Guinaliu (2010)	To explain consumers' intention to participate in firm-hosted online travel communities	Firm-hosted online travel community (Tourism)	Attitude, subjective norm, perceived behavioural control, perceived usefulness, perceived ease of use, identification	Intention to participate	The integration of technology acceptance model, theory of planned behaviour and social identity theory presents a simple way to explain intention to participate in firm-hosted online travel community

(continued)

Table 1 (continued)

Author	Purpose	Context	Independent variables	Dependent variable(s)	Results
Dholakia et al. (2004)	To investigate group-level virtual community participation: group norm and social identity	Virtual communities	Social influence, social identity, value perceptions	Desire, we-intention, participation behaviour	Social benefits such as interpersonal connectivity and social enhancement are key drivers of participation in virtual communities

6 Marketer-Generated Media and Corporate Heritage Tourism Brand

Social media has provided numerous opportunities for brand adherents to connect, share, popularise and add new members. Thus, in the context of this study, marketer-generated media are corporate-sponsored content on social media pages attached to websites owned, run and managed by corporate heritage tourism institutions. They include text, photos and videos intended to attract traffic to their corporate sites. They are used as a platform to disseminate new product knowledge, engage consumers and foster customer relationships (Dholakia et al., 2004). Some studies view marketer-generated media as an advertising platform (Bronner & Hoog 2010), as the means to disseminate information on new product (Chatterjee, 2011) and as a destination branding tool (Lim, Chung, & Weaver, 2012).

Recently, social media has enhanced online brand community through the aggregation of wider audiences without geographical limitations (Järvinen, Tollinen, Karjaluoto, & Jayawardhena, 2012). An online brand community is defined as 'a specialized, non-geographically bound community based on a structured set of social relationships among admirers of a brand' in an online setting (Muniz & O'Guinn, 2001, p. 412). Online brand communities can be corporate-sponsored (marketer-generated) or independently-owned (consumer-generated) (Adjei, Noble, & Noble, 2010). Marketers ensure that content is regularly updated, has the ability to provide fun, is entertaining and provides educational benefits (Erdoğmuş & Cicek, 2012). In the context of corporate heritage tourism brands, consumers' value co-creation can be enhanced by uploading photos and videos that not only provide captivating and attractive scenes but also offer explanations on how to navigate the destination to ensure optimum satisfaction.

7 Consumer-Generated Media and Corporate Heritage Tourism Brand

Communication in online forums among brand adherents increases brand awareness and leads to purchase intention (Adjei et al., 2010). High involvement products such as tourism services requires consumers to rely heavily on information provided by fellow consumers, and so they resort to consumer-generated media (CGM). CGM is defined as 'media impressions created by consumers, typically informed by relevant experience and archived or shared online for easy access by other impressionable consumers' (Gretzel, Kang, & Lee, 2008, p. 100). CGM are more persuasive because they reflect the typical experience of the tourist, thus, consumers rely upon them more than marketer-generated content (Sparks & Browning, 2011).

Timeliness, relevance, frequency and duration are important communication qualities that necessitate consumer-to-consumer online brand community engagement (Adjei et al., 2010). A consumer's intention to visit is influenced by the consumer's past experience, the source credibility and the content's characteristics. Consequently, a consumer's offline experience with the brand will improve the brand attitude when that brand features in a consumer-to-consumer online discussion forum (Xue & Phelps, 2004). In addition, the prior knowledge of social media platforms and level of involvement with the products and benefits sought can influence intention to use the content and visit the destination (Kang & Schuett, 2013). Not all consumer-generated media are credible, thus, source credibility, expertise and degree of similarity between the user and the creators of the content influence intention to visit (Herrero, Martin, & Hernandez (2015). Finally, the content novelty, the understandability and the ability to generate positive feelings as a result of well-designed layout can effectively increase readers' intention and positive feelings, thereby positively influencing visit intention (Chen, Shang, & Li, 2014).

8 Discussion

Brand associations are aspects of the brand linked to a consumer's memory (Rindell, Edvardsson, & Strandvik, 2010), and they influence the consumer's evaluation culminating into purchase or visit intention. Brand associations are classified into categories: attributes, benefits and attitudes (Qu, Kim & Im, 2011). According to Qu et al. (2011), attributes relate to the features that make up the brand; benefits are the values consumers derive from using the brand, and attitudes are the sum total of consumers' evaluations of the brand. Similarly, corporate heritage tourism brand attraction depends on the consumer's identification of the attributes, benefits and attitudes that consumers attach to the destination. Although

mainstream branding literature cedes the power of brand building and control to the firm, recent studies reveal that through the open source view, the consumer is an active agent of brand evolution and emergence (Pitt et al., 2006; Rindell & Strandvik, 2010; Rindell, 2013). Thus, according to Rindell (2013, p. 208), 'academic researchers and commentators have emphasized a change in thinking about brands from their role as identifiers to their function as consumer-generated dynamic and social process.' The increase in developing new social media platforms and consumers' inelastic interest in 'being current' indicate that the platforms are most powerful in brand information dissemination.

Consistent with the above, the open source argument recognises the consumer as a co-constructor and co-producer of corporate brands, thus moving the consumer from a passive recipient of marketing messages to being very active in controlling and co-building corporate brands. Social media has provided an actual platform where consumers, through comments and reviews, have actively contributed to corporate-sponsored content thereby influencing the firm's branding efforts. Similarly, online communities independently run and managed by consumers have generated content that present sincere and honest positions on the firm's products and services. Additionally, through social identity, there is a union of purpose among the adherents of the brand. Social identity also motivates participation towards the achievements of the interest of the group. Therefore, social media as a platform fosters that collective interest by providing a platform for members to share and advance the brand.

8.1 Contributions of the Study

Our study is unique and contributes to existing knowledge in the following ways. First, our study is unique as it incorporates social identity theory into the emerging corporate heritage tourism brand research stream. Although this theory has been variously used and found suitable in studying social networks and virtual communities, its application in the tourism literature remains scarce. This theory is especially important because it unravels the dynamics of in-group behaviours that are very relevant to the corporate heritage tourism brand. Our study opens a new frontier for subsequent studies in this area. Second, our study demystifies social media and explains how the two major components of social media can be applied to foster the corporate heritage tourism brand. Accordingly, social media can genuinely influence corporate heritage tourism brands either by management's corporate-sponsored content on their social media pages or through independent consumer-generated content. Either way, comments and reviews made by fellow consumers on such forums can foster we-intention and subsequently influence visit intention.

8.2 Limitations and Future Research Directions

One major limitation of our study is that it is conceptual and did not collect data to test the proposed conceptual model. Moreover, our study did not consider the different social media platforms and how they variously influence intention to visit a corporate heritage tourism brand. Additionally, our treatment of marketer- and consumer-generated media was general without showing how they affect individual visitors and group visitors. We therefore propose that future researchers should first consider qualitative research by interviewing respondents or conducting focus group interviews. We also suggest that future research should consider the different social media platforms and show how each influences the image of a corporate heritage tourism brand.

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An Analysis of Tweets by Local Mascot Characters for Regional Promotions, Called Yuru-Charas, and Their Followers in Japan

Shohei Suzuki and Yohei Kurata

Abstract This paper addresses an emerging pop culture trend in Japan involving *yuru-charas*. *Yuru-charas* are local mascot characters who work for cities and prefectures and are expected to serve as new tools for tourism promotion. Among several activities in which the *yuru-charas* engage, we studied their use of Twitter for public relations. We collected the tweet data of 16 major *yuru-charas*, as well as the data of their followers. Using three indexes for tweet data and another three indexes for follower data, we analysed the characteristics of the *yuru-charas'* Twitter use and their followers. As a result, we found that the *yuru-charas* seem to have different policies regarding Twitter use but the popular *yuru-charas* share several common characteristics.

Keywords Yuru-chara · Twitter · Mascot · Public relations

1 Introduction

McGray (2002) points out that Japan's pop culture, including anime, comic books, and character goods, already possesses a vast reserve of potential soft power. As for comic books, MacWilliams (2014) notes that Japan is one of the only countries in the world today where comic books have become a full-fledged medium of expression, on par with novels, and seemingly read by everyone. The Japanese government starts *Cool Japan Initiative*, which promotes Japanese pop-culture content (e.g. anime, comics, movies, TV programs, music, entertainment, toys, and games) in overseas countries (Ministry of Economy, Trade and Industry, 2015). Meanwhile, the use of a *yuru-chara* is an emerging Japanese pop culture trend that has attracted a

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significant amount of attention in Japan; however, it is not yet well-known internationally, even though the Japan Expo of 2016 held in France introduced the characters in the newly-created *YURU-CHARA S*ESSION (JTS Group, 2016). *Yuru-charas* are local mascots, usually with a cute and funny appearance and motions, who work for cities, villages and prefectures (in short, *regions*). In other words, they are expected to serve as tools for both external and internal marketing. Etymologically speaking, a *yuru-chara* stands for a *yuru-i* (loose) character. There are a lot of these characters in Japan. Their activities, however, as well as the underlying purpose of the *yuru-chara* managers (often local governments or tourism organizations) are different from characters to character. In addition, the degree of interest of the local residents and that of non-locals is radically different. Thus, we investigate the current situation of *yuru-charas*' activities and the interest-level of local/non-local people and based on the results, we clarify the merits of using *yuru-charas* for regional promotion. Our study will be helpful in the future when local governments and tourism organizations, especially in other countries, consider introducing *yuru-charas* as tools for regional promotion.

2 Defining the Nature of Yuru-Charas

Jun Miura, a Japanese illustrator and the first advocate for the *yuru-chara*, set forth three necessary conditions for a mascot character to be considered a *yuru-chara* (Oricon Style, 2009).

- It is designed with a strong message of love for its home province;
- Its motions are lovably awkward and unique; and
- Its character has the *yuru-sa* (looseness) that people feel attached to.

As an example of a character that satisfies the above three conditions, we can look at Fukka-chan, a *yuru-chara* from Fukaya city, Japan (Fig. 1). His horn symbolizes Fukaya's speciality product, green onions, for their promotion

Fig. 1 An example of a *yuru-chara*: Fukka-chan from Fukaya City

(Condition 1). Because he has a large head and short limbs, his motions, naturally, are lovably awkward (Condition 2). Finally, his cute appearance in a vague setting —a cross between a rabbit and a deer—satisfies Condition 3.

Since 2011, the Yuru-chara Grand Prix has taken place annually in Japan, where visitors vote for the most popular *yuru-chara* of the year. As many as 1,722 characters participated in the Fifth Grand Prix in 2015 and a total of 3,477 characters have participated since its inception (Executive Committee of the Yuru-chara Grand Prix, 2016). This event, however, permits the participation of many characters that do not satisfy the above three conditions. This means that the notion of *yuru-chara* is becoming vague. Thus, this study re-defines a *yuru-chara* by considering the differences between *yuru-charas* and other mascot characters.

Disney characters and Pokémon characters are typical examples of mascot characters. They appear in animations and video games and are commercial products themselves. On the other hand, *yuru-charas* are not commercial products themselves but are marketing tools by nature. This is the first important feature of *yuru-charas*.

Like Michelin's Michelin Man and Expedia's Exbear, some mascot characters owned by companies are also used as marketing tools. These company characters are considered *yuru-charas* in a broader sense. Indeed, TripAdvisor's Owly entered the 2015 Yuru-chara Grand Prix. As Jun Miura advocates, however, *yuru-charas* in the original sense are characters for promoting particular regions, not companies. Thus, we consider that locality is another essential feature of *yuru-charas*.

Based on the above considerations, we re-define *yuru-charas* as follows:

> Yuru-charas are cute mascot characters for the promotion of regions, notably for the promotion of their local products and/or tourism in the region.

Some researchers study the commercial and non-commercial effects of *Yuru-charas* as well as their features. For example, Kaneko (2013) insists that Japanese pop culture may play an effective role in marketing tourism, studying the *yuru-chara* of Hikone city, Hiko-nyan, as a typical case of this type of economic success. Kaneko concludes that Hiko-nyan's great success inspired many cites, organizations, companies, and community groups to create their own *yuru-charas*. Yamamura (2015) studied an event hosted by Saitama prefecture where many *yuru-charas* across Japan got together as part of a unique tourism-related policy of the local government. He reported that the number of visitors for this event increased from 50,000 in 2010 to 410,000 in 2014.

Jiyavorananda et al. (2016) insisted that *yuru-sa* in the Japanese language is a vague concept, even though it is an essential feature of *yuru-chara*, and revealed by factor analysis that friendliness and childlikeness are closely related to *yuru-sa*. Birkett (2012) conducted an interview survey on *yuru-chara* managers and staff and reported that *yuru-charas* are allowed to make mistakes due to their childlikeness and, accordingly, the actors behind them do not need to be professionals. This is an important point for many organizations that lack a sufficient budget for alternative promotion mechanisms.

In the field of entertainment computing, Hotogi and Hagiwara (2015) developed a *yuru-chara* generator based on an analysis of *yuru-charas*' physical features such as eyes and mouths.

Among many *yuru-charas*, the most successful is probably Kumamoto prefecture's Kumamon. Kumamon is the champion of the first Yuru-chara Grand Prix of 2011. In 2015, the total sales of Kumamon-related products recorded one-hundred billion yen (around 990 million US dollars), including 2.1 billion yen in overseas markets, especially Hong-Kong, Taiwan, and Thailand (Kumamoto Prefecture, 2016). Hirota (2014) studied the administration of Kumamon from the viewpoint of the business ecosystem and revealed that Kumamon plays an important role in regional promotion and development both in and out of the region. He insists that other *yuru-charas* should play such a role.

Promotion and communication with fans on a Social Networking Service (SNS) are also important missions of *yuru-charas*. In Japan, many *yuru-charas* have their own SNS accounts, especially on Twitter and Facebook. Because SNS allows marketing managers to communicate with many people without spending much time and money, it is used not only as a promotion tool to non-local consumers but also a tool of communicating with local residents (Suzuki & Morimoto, 2014). This implies that SNS can be a tool for *Yuru-charas* to conduct marketing for people in and out of the region. It is not clear, however, how *yuru-charas* make use of SNS today and what types of people are attracted to *yuru-charas*' activities on SNS. Thus, focusing on Twitter as an SNS, where interactive communication between users often takes place, this paper analyses *yuru-charas*' use of Twitter and the characteristics of their followers.

3 Research Method

We collected Twitter data related to *yuru-charas* using Twitter API. First, we listed all 26 *yuru-charas* who won first through tenth prize in any Yuru-chara Grand Prix from 2011 to 2015. Among these 26 *yuru-charas*, 17 characters have Twitter accounts but one account was stopped. Thus, we selected the remaining group of 16 characters (Table 1) as the target of our study.

Before explaining the analysis method, we will discuss the name and appearance of the *yuru-charas*. Typically, *yuru-charas* are named and designed according to the following three elements: (i) the name of the region to which the *yuru-chara* belongs, (ii) the region's speciality product, and (iii) the name of a famous person/animal related to the region. For example, Kumamon belongs to Kumamoto prefecture and accordingly, its name includes the word *kuma* (bear) and looks like a bear. Ehime prefecture's Mican is named and designed after the region's speciality product, the *mikan* (orange) and looks like an orange. Finally, Shizuoka prefecture's Ieyasu-kun is named and designed after Ieyasu Tokugawa, who governed Japan in the 17th century and spent his youth and senior years in this region.

Table 1 Profiles of our target study group

								
Name	Kumamon	Bary-san	Nishiko-kun	Fukka-chan	Takinomichi Yuzuru	Sanomaru	Shimanekko	Ieyasu-kun
Affiliation region	Kumamoto pref	Imabari (Ehime pref.)	Nishikokubunji (Tokyo pref.)	Fukaya (Saitama pref.)	Minoh (Osaka pref.)	Sano (Tochigi pref.)	Shimane pref.	Hamamatsu (Shizuoka pref.)
Highest rank (Year)	1 (2011)	1 (2012)	3 (2011)	2 (2014)	9 (2011)	1 (2013)	6 (2012)	1 (2015)
								
Name	Choruru	Kawarimi senbei	Shippei	Mican	Shinjyo-kun	O-ujicha-ma	Merugyu-kun	Tochisuke
Affiliation region	Yamaguchi pref.	Fukuoka pref.	Iwata (Shizuoka pref.)	Ehime pref.	Susaki (Kochi pref.)	Uji (Kyoto pref.)	Oyabe (Toyama pref.)	Tochigi (Tochigi pref.)
Highest rank (Year)	2 (2012)	8 (2013)	9 (2013)	2 (2015)	4 (2015)	5 (2014)	5 (2015)	6 (2015)

Typically, through these names and appearances, people learn the name, speciality, and/or history of the region.

3.1 Analysis of Tweets

We collected the tweets posted by each *yuru-chara* and analysed the content (text and photographs). We collected the tweets from the oldest through June 30, 2016 (note that Twitter API allows us to collect the most recent 3,200 tweets for each account). Then, we calculated the following three indexes to analyse the *yuru-charas*' tweets.

Reply rate. The reply rate of a *yuru-chara's* account is defined as the number of his/her reply tweets over the number of his/her total tweets. While ordinary tweets are sent to anonymous people, reply tweets indicate interactive communication with specific users. The reply rate is expected to indicate how actively each *yuru-chara* communicates with his/her followers and other Twitter users.

Photograph rate. The photograph rate of a *yuru-chara's* account is defined as the number of photograph-attached tweets over the total number of tweets (except reply tweets). The attachment of photographs to SNS posts evokes more interest from viewers and increases the number of reactions (e.g., retweets and like-button clicks) (Burkhalter, 2015; Rogers, 2014; Ross, 2014). Meanwhile, it requires more work to prepare a photograph for a tweet. Thus, the photograph rate is expected to indicate the eagerness of each *yuru-chara* on Twitter.

Notice rate. The notice rate of a *yuru-chara's* account is defined as the number of notice tweets over the number of total tweets (except reply tweets). The main content of *yuru-charas*' tweets is in the form of activity reports (or diary entries), which are usually posted after an event. The *yuru-charas* who post notice of events and the contents of activities beforehand are considered active in their promotion activities on Twitter. We manually identify these notice tweets by looking for future dates expressed in the tweets.

3.2 Analysis of Followers

We collected data on the followers of each *yuru-chara*'s account and analysed it. The data was collected on July 1, 2016. The follower data contains various items, among which, we used the location and description. The location was found in texts that expressed each follower's self-reported place of residence. The description was found in texts that expressed each follower's self-introduction. With these two items, we calculated the following three indexes:

Ratio of local followers. The ratio of local followers of a *yuru-chara*'s account is defined as the number of local followers who presumably live in the region that the *yuru-chara* promotes over the total number of its followers. This index is expected to

indicate how much interest each *yuru-chara* attracts from local residents. Unfortunately, Twitter does not have a specific format for the location item and accordingly, we cannot apply the raw location data to the analysis. Thus, we manually identified from location expressions the county of the follower's residence and, if it was Japan, his/her prefecture as well and the identified country/prefecture to calculate the ratio of local followers. If multiple countries/prefectures were identified, the follower's place of residence was categorized as unclassifiable.

Ratio of official-account followers. The ratio of official-account followers of a *yuru-chara's* account is defined as the number of its official-account followers who use official accounts over the total number of followers. This index indicates the degree of non-personal followers such as companies and shops. Twitter verifies official accounts and Twitter API allows us to see whether or not an account is verified. However, many official accounts have not applied for Twitter verification. For example, the Twitter accounts of the 16 *yuru-charas* we analysed were claimed to be official accounts on their official websites but only two of them (Kumamon and Takinomichi Yuzuru) have been verified by Twitter. Thus, we simply consider all accounts with the description *koshiki* (meaning 'official' in English) to be official accounts.

Ratio of non-Japanese followers. The ratio of non-Japanese followers of a *yuru-chara*'s account is the number of followers who presumably live outside of Japan over the total number of followers. This index was calculated to measure the *yuru-chara's* popularity. We also look at the countries that show interest in each *yuru-chara*.

3.3 Classification of Yuru-Charas

Finally, we categorize the 16 *yuru-charas* using the content-related indexes in Sect. 3.1 and the follower-related indexes in Sect. 3.2. As a method of categorization, we adopted Multi-dimensional Scaling (MDS). MDS is a method to position target items in a low-dimensional space (usually 2D or 3D) based on a dissimilarity matrix (Borg & Groenen, 2005). A pair of items with low dissimilarity (i.e., similar items) are placed nearby, while those with high dissimilarity are placed further away. Thus, the 2D/3D plot gives us insight into inter-item similarities. We also standardized all items beforehand in order to remove the scale effect.

4 Results

Table 2 shows the contents of tweets and characteristics of followers of the 16 *yuru-charas* listed in Table 1, which form the target group for our analysis.

Table 2 Contents of tweets and characteristics of followers of the 16 yuru-charas

Tweets				Followers						
Name	Reply rate (%)	Photo graph rate (%)	Notice rate (%)	Number of followers	Ratio of local followers (%)	Ratio of official-account followers (%)	Ratio of non-Japanese followers (%)	Prefecture	Ratio of prefectural population (%)	Z-score
Kumamon	65.2	95.8	2.7	497,270	9.4	0.2	13.1	Kumamoto	1.40	224.0*
Bary-san	28.3	79.9	1.5	190,282	11.6	0.3	3.0	Ehime	1.10	212.8*
Nishiko-kun	55.3	60.5	4.3	52,768	41.6	0.2	1.1	Tokyo	10.20	130.3*
Fukka-chan	96.4	72.8	18.4	53,977	30.2	4.1	1.8	Saitama	5.60	118.4*
Takinomichi Yuzuru	13.1	28.0	8.0	17,141	41.1	1.6	1.2	Osaka	6.90	97.5*
Sanomaru	13.3	70.0	10.7	11,397	18.7	3.9	1.4	Tochigi	1.60	73.1*
Shimanekko	3.4	52.6	5.4	53,981	13.8	0.1	1.5	Shimane	0.60	207.6*
Ieyasu-kun	84.2	63.9	11.7	14,322	52.0	0.2	1.0	Shizuoka	2.90	204.6*
Choruru	0.0	88.9	13.9	4,600	39.2	6.3	1.2	Yamaguchi	1.10	133.0*
Kawarimisenbei	78.0	93.7	1.1	6,600	23.4	2.0	0.9	Fukuoka	4.00	45.7*
Shippei	97.7	98.7	16.0	12,457	45.7	1.8	1.8	Shizuoka	2.90	151.3*
Mican	0.0	0.1	8.2	5,536	34.9	9.3	1.4	Ehime	1.10	136.7*
Shinjyo-kun	92.3	55.6	6.0	20,255	13.3	1.0	1.5	Kochi	1.10	91.7*
O-ujicha-ma	14.4	33.4	12.0	6,151	24.1	1.2	1.7	Kyoto	2.10	71.2*
Merugyu-kun	25.1	20.2	3.0	2,502	25.2	4.5	1.7	Toyama	0.90	85.0*
Tochisuke	10.3	54.2	12.2	1,643	44.2	5.3	0.9	Tochigi	1.60	80.2*

*$p < 0.001$

4.1 *Analysis of* Yuru-Chara *Tweets*

Table 2 summarizes the results of the three tweet indexes we calculated. The reply rates of Fukka-chan, Shippei, and Shinjyo-kun were over 90%, while those of Choruru and Mican were 0%. This contrasting result indicates that some *yuru-charas* have a clear policy of active reply or non-reply. Photograph rates for the 16 characters were generally high with a mean of 60.5% and a median of 62.2%, with the exception of Mican at 0.1%. Notice rates were generally low and the highest was that of Fukka-chan (18.4%). Most of the tweets other than notice tweets were activity reports from each *yuru-chara.*

4.2 *Analysis of Followers*

The total number of followers of the 16 *yuru-charas*' accounts was 982,040 and the number is reduced to 701,150 when we exclude overlaps. Among the 701,150 followers, 312,788 report their locations (45%) but the identification of area of residence was successful for only 191,132 followers (27%).

Table 2 shows the results of the three follower indexes we calculated. First, ratio of local followers depends on the *yuru-chara*. Precisely speaking, we had to take population into account. For example, Nishiko-kun's ratio of local followers is high (41.6%) but this may simply be because it is from Tokyo, which has the largest population among all prefectures in Japan. Thus, we calculated the significance of the ratio of local followers using hypothesis testing for the population proportion. In this statistical test, we use the following Z-Score:

$$Z_0 = \frac{|p - P_0|}{\sqrt{P_0(1 - P_0)/n}} \tag{1}$$

where p is the ratio of local followers, P_0 is the ratio of prefectural population to Japan's total population and n is the number of Japanese followers. The test results show that for every character, the ratio of the local followers is significantly larger than the ratio of the prefectural population to Japan's total population. The *yuru-chara* with the largest Z-score (i.e., the *yuru-chara* followed by the most local people considering population) was Kumamon and that with the smallest Z-score was Kawarimisenbei. A possible reason why Kawarimisenbei is not followed by local people, relatively speaking, is that this character is not managed by a public organization such as a local government but by a company (a local food manufacturer).

Second, ratios of official-account followers were less than 10% for all *yuru-charas* (Table 2) and the ratios for Kumamon, Bary-san, Nishiko-kun, Shimanekko, and Ieyasu-kun were as low as less than 0.3%. Meanwhile, Mican had the highest rate of official-account followers.

Third, the ratios of non-Japanese followers were not much different among the *yuru-charas* with one exception: Kumamon (13.1%). We calculated the proportion of the residential locations of the non-Japanese followers of the 16 *yuru-charas*. The country with the highest number of followers was Taiwan (39%), followed by Thailand (18%), China (12%), Hong Kong (7%) and USA (7%). The popularity in

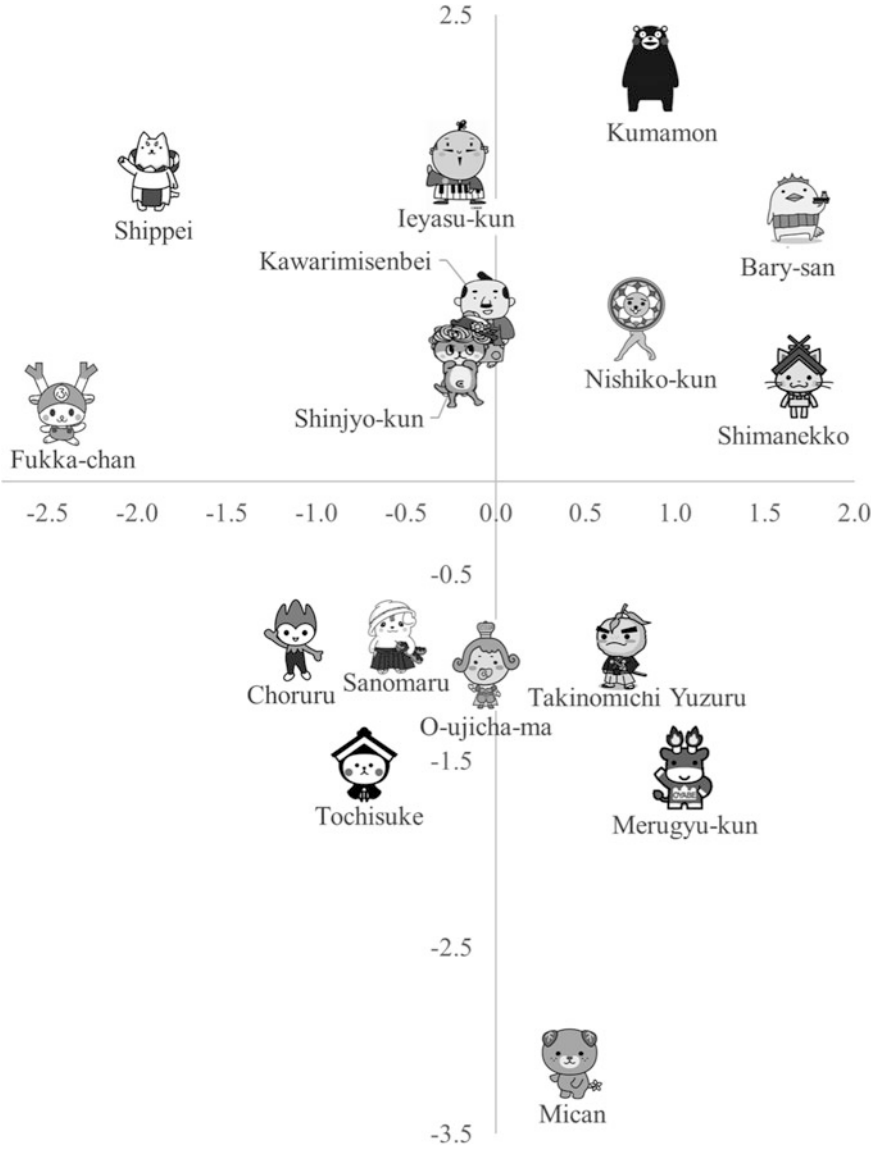

Fig. 2 Similarities between the *yuru-charas* based on our Twitter findings

Taiwan is probably due to active promotion targeting Taiwanese by Kumamon. In addition, because all of the tweets of the *yuru-charas* are in Japanese, countries with a larger number of people who understand Japanese will likely have a larger number of *yuru-chara* followers. This implies that in order to acquire international followers, each *yuru-chara* must tweet in non-Japanese languages as well.

4.3 Classification of Yuru-Charas

Using MDS, we made a two-dimensional scatter plot that indicates similarities between *yuru-charas* (Fig. 2). In this plot, Mican and Fukka-chan are distanced from other characters, which implies the peculiarity of these two characters. The most successful *yuru-chara*, Kumamon, is located in the first quadrant of the graph and Bary-san and Ieyasu-kun are located relatively near Kumamon. In addition, Nishiko-kun and Shimanekko, both located in the graph's first quadrant, are considered to have similar index values related to Twitter. Among the distances between each pair of *yuru-charas*, the distance between Kawarimisenbei and Shinjyo-kun is the shortest, which implies that this pair is the most similar in terms of Twitter use. Similarly, Sanomaru is located near Choruru and O-ujicha-ma, which implies their similarity. Unfortunately, however, the graph does not help us to categorize *yuru-charas*.

5 Discussion

We analysed the Twitter use and characteristics of followers of major *yuru-charas*, using the six indexes introduced in Sect. 3. Based on our results, especially the results of the MDS plot in Sect. 4.3, this chapter discusses the characteristics of each *yuru-chara*.

First, we examine the features of two *yuru-charas* that are remotely located in the MDS plot; Mican and Fukka-chan. Mican shows the lowest reply and photograph rates, which indicate Mican's negative attitude toward Twitter use. Indeed, Mican attracts a small number of followers (5,563 followers), even though it has won second place in a Yuru-chara Grand Prix. Conversely, Fukka-chan shows very high reply and photograph rates, which indicate his positive attitude toward Twitter use. Indeed, Fukka-chan attracts the fourth largest number of followers among the 16 *yuru-charas* (53,977 followers). Among the top five *yuru-charas* with more than 50,000 followers, however, he is the only one located at the left side of the MDS plot. This is due to his distinctively high notice rate. We discuss the meaning of high/low notice rates below.

Next, we examine the features of several *yuru-charas* who have similarities to the most popular yuru-chara, Kumamon. Bary-san has similar features to Kumamon except his low reply rate. Ieyasu-kun has similar features to Kumamon except his

high notice rate. Both Bary-san and Ieyasu-kun are popular characters, having won the first prize in a Yuru-chara Grand Prix. In addition, Nishiko-kun and Shimanekko, who are located in the first quadrant of the MDS plot with Kumamon, are among the top five popular characters in terms of follower number. Among the six indexes we proposed, we observed a remarkable difference in the notice rates between these popular *yuru-charas* and others. At first, we expected that *yuru-charas* would have high notice rates because their mission is regional promotion. In reality, however, popular *yuru-charas* have low notice rates. This is probably because consumers want *yuru-charas* to speak as themselves, instead of speaking directly about regional promotions. In other words, like Disney characters, *yuru-charas* themselves attract fans and become icons with commercial value. This contradicts the definition of *yuru-charas* in Sect. 2 and makes the concept vague.

6 Conclusions and Future Work

Yuru-charas have begun to be used for regional promotion in Japan and many *yuru-charas* are making use of SNS. However, it is not clear why they use SNS. Thus, first we studied *yuru-charas'* use of Twitter and the characteristics of their followers.

Our results show that *yuru-charas* generally have many followers, including both fans of the characters and fans of the *yuru-charas'* regions. Thus, by using *yuru-chara*-name accounts, public relations messages can even reach people who are not interested in the region and accordingly, they may eventually become fans of the region. In addition, because *yuru-charas* have many local followers, *yuru-chara*-name accounts can be used as tools for internal marketing. For example, local organizations that manage *yuru-charas*, such as local governments and tourism organizations, can ask local residents to participate in local festivals and events as volunteers or inform them of local attractions by using the *yuru-charas*' tweets. In this way, *yuru-charas* can likely contribute to regional development and promotion as marketing tools.

Meanwhile, local organizations will often have *yuru-chara*-name accounts as well as formal/official accounts. It is still not clear why some local organizations use two accounts or when and why they choose to conduct public relations activities under the name of the *yuru-chara* instead of the formal/official account.

There are likely several reasons why *yuru-chara*-name accounts work better than formal/official accounts. First, as our study clarified, it is very possible that *yuru-chara*-name accounts' public relations activities reach many non-local people. Second, *yuru-chara*-name accounts can communicate with followers interactively on Twitter. This interactive communication is difficult through formal/official accounts because public organizations, including those who manage *yuru-charas*, are required to provide strictly factual information on their formal/official accounts. Third, once a *yuru-chara's* way of talking and personality is established, the *yuru-chara's* tweet style is rarely influenced by a change of operators or a change in management.

Due to these reasons, it is likely that the number of local organizations who use *yuru-chara*-name accounts will rapidly increase. In order to confirm this, further studies are needed. To this end, we should compare the characteristics of the followers of formal/official accounts and those of *yuru-chara*-name accounts. In addition, in order to see the interactiveness, replies to the followers on the formal accounts and those on the *yuru-chara*-name accounts should be compared. Of course, we should also interview the local organizations regarding their strategies for Twitter use.

Recently, *yuru-charas* (or *yuru-chara*-like mascot characters) have been created in many countries other than Japan. For example, Xochimilco, Mexico has created *Lupita,* a funny-looking character that is modelled after a Mexican salamander. Berlin, Germany has BearlinTower, which is modelled after the Berlin Tower and a white bear. Big Lincoln, modelled after Abraham Lincoln, promotes the State of Illinois in the USA. Likely, many *yuru-charas* will be created in various countries in the future. The above studies, which clarifies the benefits and potential issues of *yuru-chara*-name Twitter accounts, will be useful for regional promotion organizations in various countries to discuss the future use of *yuru-charas* and SNS public relations under the name of the respective *yuru-charas*.

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Part X
Sharing Economy and New Business Models

A Method to Assess Sustainable Mobility for Sustainable Tourism: The Case of the Public Bike Systems

Ainhoa Serna, Jon Kepa Gerrikagoitia, Unai Bernabe and Tomás Ruiz

Abstract Tourism is closely related to transport and mobility, and sustainable tourism and transport is in the agenda of the main tourism stakeholders and policy makers. In this context, the bicycle is meant to play an important role as a sustainable transport mode and a key driver for sustainable tourism. This paper analyses the public bike share systems (PBS) in Spain through sentiment analysis of Social Media data (TripAdvisor, Twitter and Facebook) with opinions of residents and visitors, identifying positive and negative factors and their potential impact on sustainable tourism and transport. The approach is qualitative and quantitative, and takes into account data from 46 PBS systems during 2010/2016 period. The findings show that tourism, transport and mobility infrastructures such as bike paths, stations, timetable, and eBike provision need a coordinated planning as they are intrinsically related.

Keywords Public bike-sharing (PBS) · Sustainable tourism · Sustainable transport · Social media analysis · Sentiment analysis

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1 Introduction

Tourism is a global phenomenon with great social and economic impact. The World Tourism Organisation predicts that International tourist arrivals will reach 1.4 billion by 2020 and 1.8 billion by 2030 (United Nations World Tourism Organization [UNWTO], 2011). Wheeller (1991) argued that the demand for travel and tourism is growing at an unsustainable rate and ameliorative measures do not readily provide an answer to unbridled global demand for tourism (as cited in Lumsdon, 2000, p. 363).

Tourism is closely related to transport and mobility, and sustainable tourism and transport is in the agenda of the main tourism stakeholders and policy makers. According to Leiper (1990) the inextricable relationship between transport and tourism is of fundamental importance in explaining the tourism system (as cited in Lumsdon, 2000, p. 361) and tourism measurement in regards of the economic impact (Frechtling, 2010). Sustainable tourism is closely related to sustainable transport, as transport is one of the main tourism characteristic activity (UNWTO, 2013). Transport is a key enabler of social and economic development, and the transport sector accounts for 9 million jobs across the EU[1] (2013). Nine out of 10 EU citizens believe that the traffic situation in their area should be improved (European Commission, 2009).

In this context, the bicycle is meant to play an important role as a sustainable transport mode and a key driver for sustainable tourism. According to Lumsdon (2000) there are 200 million bicycles in Europe (in comparison to 160 million cars), but only 10% are used on any given day, of which 4% is estimated to be for leisure purposes (European Union, 1997). Research by Picket, Eijgelaar, and Peeters (2013) illustrated that cycle tourists' daily spending is comparable to that of other tourists, and that cycle tourism can contribute significantly in particular to rural economies that have not previously enjoyed mainstream tourism development. They arrived at a total estimated direct expenditure in Europe of almost €44 billion (€35 billion from day trips and €8.94 billion from overnight trips). Cycle tourism is therefore a good example of a low carbon tourism product. 'Cycle tourism' appears to represent a potential exemplar of sustainable tourism (Richards & Hall, 2003).

Besides, in the last decade, bike-sharing or public bicycle transport has experienced tremendous growth, thanks to the development of better methods of tracking of bikes with improved technology (DeMaio, 2009). Public bike-sharing systems have been gaining increasing popularity in transportation plans as a strategy to multiply travel choices, promote the use of active modes of transport, decrease the dependence on the automobile, and especially reduce greenhouse gas emissions (Contardo, Morency, & Rousseau, 2012). In addition, opinions and experiences are central to almost all human activities and are key factors in influencing our behaviour (Liu, 2012). The User-Generated Content (UGC), and in

[1]Attitudes of Europeans towards urban mobility 2013. http://ec.europa.eu/public_opinion/archives/ebs/ebs_406_en.pdf.

particular, the online comments have allowed substantial changes in the dynamic of entire sectors. Therefore, the analysis of that type of information related to Public Bike-Sharing systems can be very important for transport analysis and sustainable tourism. Moreover, sentiment analysis of online textual content offer the opportunity to improve traditional survey methods to collect travel behaviour data, decreasing bias in the data, reducing respondent burden, and increasing data quality.

The aim of this research is to analyse the PBS in Spain using social media data with opinions of residents and visitors, identifying positive and negative factors and their potential impact on sustainable tourism and transport. Furthermore, this study suggests a methodology that DMOs (Destination Management Organizations) can take advantage of for destination management and policy making.

The structure of the paper is as follows: Sect. 2 presents an overview of research in the field of PBS systems, sustainable tourism and social media analysis in the study of sustainable transport. Section 3 describes the methodology, after that, Sect. 4 outlines the case study. Section 5 details the results obtained using the bike-share data and applying the sentiment analysis process carried out in this study, and in the last section, conclusions and future lines are explained.

2 Related Work

Research into PBS systems is relatively recent. In 2009, Shaheen, Guzman, and Zhang (2010) estimated that about 100 bike sharing programs were implemented in 125 cities, for a total of more than 140,000 bikes worldwide. In 2010, 45 new operations were planned in 22 countries. There is also increasing interest in the research community in understanding how PBS systems are used and what factors affect travel behaviour (as cited in Contardo et al., 2012, p. 1).

There have been different generations of PBS systems. The first generation in 1965 in Amsterdam (Schimmelpenninck, 2009) and the second generation in 1991 (Nielsen, 1993) were specially designed for intense utilitarian use and could be picked up and returned at specific locations throughout the central city with a coin deposit but the bikes experienced theft due to the anonymity of the user. The third generation (Henley, 2005) brought a variety of technological improvements, including electronically-locking racks or bike locks, telecommunication systems, smartcards and fobs, mobile phone access, and on-board computers. According to DeMaio (2009) the fourth generation could make improvements in every aspect of bike-sharing, such as methods of check-out and return, ease of use, fixed and flexible stations, tracking of the bikes and mileage, bike and station design, powering stations, etc.

The recent increase of PBS systems around the world is being accompanied by an emerging literature related to bike share use. Several factors associated to the use of bike share systems have been identified. Some characteristics of the system operation are positively associated to bike share use, such as accessible sign-up

processes, 24/7 opening hours, incentives to sign up new members and casual users (Fishman, Washington, & Haworth, 2012). The presence of bike lanes is obviously an important factor (Buck & Buehler, 2012; El-Assi, Mahmoud, & Habib, 2016). But the location of docking stations is a critical influence on bike sharing users (Pai & Pai, 2015). PBS has been included in the last years as an active topic in the transportation research area where important efforts have been carried out integrating bike share programs into a sustainable transportation system with relevant contributions at city level (Shaheen, Zhang, Martin, & Guzman, 2011; Jensen, Rouquier, Ovtracht, & Robardet, 2010; Kaltenbrunner, Meza, Grivolla, Codina, & Banchs, 2010; Vogel & Mattfeld, 2010). In this context, PBS schemes have been implemented in order to enhance sustainable mobility in urban areas (Midgley, 2011).

In the field of PBS and tourism, Kaplan, Manca, Nielsen, and Prato (2015) explored the behavioural factors underlying tourist intentions to use urban bike-sharing for cycling while on holiday, revealing a great interest in using bike-sharing, frequently and for multiple purposes; an appeal of electric bicycles to tourists with high interest in bicycle technology, low perceived cycling ease, and weak favourable norms toward cycling. Hampshire and Marla (2012) have explained the factors effecting bike sharing trip generation and attraction, providing an empirical foundation for cities and planners in understanding the key factors contributing to bike sharing usage. This study posits three main user groups for bike sharing: commuters, students and tourists.

Related to urban tourism, having the city of Seville as use case, presents the importance of the transport infrastructure, including the bicycle system, as a key driver to promote and add dynamism to the destination (Pisonero, 2011).

On the other hand, recent investigations include social media analysis in the study of urban transport. For example, on-line social networks are being used to conducting transport surveys (Efthymiou & Antoniou, 2012). Information and Communication Technologies (ICTs) are nowadays affecting both tourism experience and the related industry (Buhalis & Law, 2008; Law, Leung, & Buhalis, 2008). According to Marchiori, Di Nardo, Mariani, and Cantoni (2016) in the Online Travel Reviews (OTRs) context, destination reviews represent a part of the tourism reviews available online and are the ones generally related to experiences at/description of tourism destinations. OTRs are a real argumentative textual genre, which deserves to be studied as a communicative event able to strongly influence travellers' choices. De Ascaniis and Gretzel (2013) examined OTR as communicative acts and studied all the characteristics of online texts. It is remarkable that TripAdvisor has the highest ranking in search engines and supplies the biggest amount of travel reviews in the tourism sector. It contains traveller experiences, i.e. are occasional trips, although it may be for different reasons such as leisure, work, etc.

Grant-Muller et al. (2015) identify the main requirements for a harvesting methodology of social media information in the transport context, and highlights the challenges involved. Gal-Tzur et al. (2014) explore two sides to engagement with social media—firstly the potential uses of social media by transport service

suppliers and secondly the potential value to policy development of shared transport related information by the public. Furthermore, Bregman (2012) describes the use of social media among transit agencies and documents successful practices in the United States and Canada. Grant-Muller et al. (2014) describes technical challenges related to mining social media data within the transport context, laying the foundation for further research in this field. Sema, Gerrikagoitia, Bernabé and Ruiz (2016c) empirically demonstrate the feasibility of the automatic identification of the sustainable urban mobility problems in the discourses generated by the UGC. Their approach enriches the data of the traditional surveys, extends traditional analysis with big data methods, using data mining algorithms and natural language processing techniques to extract urban mobility information from social media data.

Serna, Gerrikagoitia, Ruiz, Bernabé, and Arroyo (2017 unpublished article) present a method and a technology to evaluate positive and negative perceptions related to sustainable travel modes as public bike sharing systems. The results of the sentiment analysis are used to define explicative variables of the demand of public bike sharing systems. Those variables are statistically significant together with climate data and characteristics of the systems, in a random effects panel data negative binomial model. Their study demonstrates that sentiment analysis of social media data can complement traditional methods to study travel behaviour, getting a richer and a more complete picture for urban transport planning.

3 Methodology

Sentiment analysis consists of a quantitative and qualitative content analysis following Walle's (1997) approach. As the purpose of the sentiment analysis is to have a general overview of perceived sentiments (Serna, Gerrikagoitia & Alzua, 2014; Serna, Marchiori, Gerrikagoitia, Alzua-Sorzabal & Cantoni, 2015), large quantities of data were analysed. For the specific issue of travel mode classification, apart from quantitative analyses, a qualitative approach is necessary to understand their deeper meanings and likely interpretations by individuals (Mariné Roig, 2013).

The methodology used consists of five main phases: source identification, social media source, data acquisition; data preparation for analysis and data curation (Serna et al., 2015, 2016c; Serna, Gerrikagoitia & Bernabé, 2016a, b).

In the "Source Identification" step, a semantic discovery module has been developed to reveal sources of relevant data to be analysed. A variety of sources of interest has been uncovered such as the Spanish Bike Share Observatory, Twitter and Facebook channels, as well as certain sections of TripAdvisor concerning the transportation category. Social Media Source put focus on Twitter, considering active twitter users (@) and topics (#) related to bicycle public transport in Spain are monitored. Facebook channels related to PBS systems in Spain. TripAdvisor comments refer to experiences that include information about mobility as one of the categories. The data collection has been performed in two languages, English and Spanish, selecting posts from section Transport and "Outdoor activities".

"Data Acquisition", is the process of gathering, filtering and cleaning the unstructured data before making them persistent in a storage solution on which data analysis can be carried out. In this step the information is extracted automatically from TripAdvisor, Twitter, and Facebook.

"Data Preparation for Analysis" process is concerned with making the raw data amenable to use in decision-making. First, the comments are loaded one by one and after that, the language about the comments from social media is detected with Shuyo language detector (Shuyo, 2010). Later, the texts are corrected using Aspell (Atkinson, 2003), a spell checker that is customized with localism and abbreviation. Once the text is corrected, each word is morph syntactically noted, using Freeling methodology (Padró & Stanilovsky, 2012).

"Data Curation" process handles the active management of the data over its life-cycle to ensure that it meets the necessary quality requirements. Categories are identified and a sentiment analysis process is carried out. For this purpose, WordNet[2] aligned with SUMO[3] ontology, and ad hoc software is used. WordNet is a lexical database that relates hyponyms/hypernyms with sets of synonyms called synsets, which can be interpreted as specialization relations between conceptual categories. Among all identified categories, only those related to *TransportationDevice* (travel mode) are selected. Sentiment analysis is done at different levels: word, sentence and comment.

4 Case Study

The study area comprises PBS systems in Spain. During the last decade, Spain is one of the countries that has implemented more PBS systems, and is the fourth country with more PBS in the world (China 436, USA more than 200, Italy 168, Spain 127).[4] PBS systems in Spain where demand data is available have been included in our analysis. The period analysed to obtain a global sentiment analysis was from 2010 to 2016 and there are 46 PBS in Spain with annual demand data available for this period. In total 42,626 comments have been analysed written in Spanish, English, Catalonian, Basque and French.

[2]WordNet Lexical Database: http://wordnet.princeton.edu. Accessed Aug 2, 2016.

[3]Suggested Upper Merged Ontology (SUMO). http://www.adampease.org/OP/. Accessed Jun 1, 2016.

[4]The Bike-sharing World Map. http://www.bikesharingmap.com. Accessed Jun 1, 2016.

5 Results

The first results are described in a temporal evolution line chart (Fig. 1) with the number of observations (comments) in three series corresponding to Facebook, Twitter and TripAdvisor from 2010 to 2016. Years are shown on the x axis and the number of comments on the y axis.

Figure 1 shows that the research topic is gaining relevance and presence in social media year by year. Note that 2016 is an incomplete dataset yet, with only 6 months of observations gathered. The results of 2015 are remarkable in growth of comments in Twitter. It can be seen that in the 2 years 2015 and 2016 there is a larger number of comments probably due to the increased use of social media.

Total volume of comments in 46 cities is 42.626. Barcelona is the city that obtains the maximum with 5,758 comments and 1,611,822 inhabitants, followed by Madrid 5,241 (3,165,235 inh.), Malaga 4,709 (566,913 inh.), Gijon 3,706 (274,290 inh.), Valencia 3,569 (786,189 inh.) and Bilbao 3,046 (346,574 inh.).

Furthermore, it is important to differentiate Twitter and Facebook comments that have been written by users and companies in order to perform the analysis separately. Also the language of the comments, as the proportion of the use of different languages detected in the various data sources (see Table 1), in *TripAdvisor* 84% of comments are mainly in English and only 16% in Spanish.

In global, the 76% is written in Spanish and 12% in Catalan almost the same than in English with the 11%, 1% Basque and 0.1% in French. Except in TripAdvisor that English is the majority language used, the common language is Spanish logically.

About the volume, Twitter is the social network with more comments, 64% of the total, remarking that 47% of the comments are posted by PBS companies and 17% from users. Facebook represents the 25% of the comments with 9% from companies and 16% from users. Finally, TripAdvisor provides the 11% of the comments.

The results of the polarity analysis show that there are differences about commented topics in the observed social networks. For each entity the polarity, positive or negative polarity and the number of occurrences have been calculated for 46

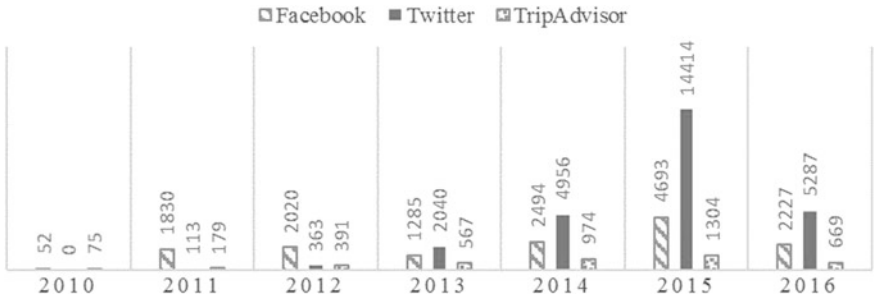

Fig. 1 Temporal evolution—social media comments

Table 1 Social media languages

Languages	TripAdvisor	Twitter companies	Twitter users	Facebook companies	Facebook users	Total by language
Spanish	716	16,870	5,548	3,316	6,133	32,583
Catalan	0	2,507	1,421	552	805	5,285
English	3,903	568	113	39	142	4,765
French	0	18	8	4	11	41
Basque	0	335	44	21	0	400
Total	4,619	20,298	7,134	3,932	7,091	43,074

Table 2 Social media bike aspects in 2015

Aspects	Twitter users	Twitter companies	Facebook users	Facebook companies	TripAdvisor
Incidence	286	89	93	73	4
Stations	162	1,890	61	8	0
Service	154	272	278	76	837
Schedule	43	40	32	13	41
Paths	37	136	14	5	8,152
Complaint	28	7	56	1	0
Bike quality	21	14	22	12	297
Price	18	20	18	7	488
Experience	12	24	15	2	903
Guide	4	19	6	1	2,741
Total	765	2,511	595	198	13,463

cities by year. In Twitter and Facebook, the most commented topics are incidence (maintenance is included), stations (number of stations, dockings by stations), and service. However, in TripAdvisor the most commented topics are Paths (58%), followed by Guide (20%) and Experience (6%) (see Table 2).

In TripAdvisor, unlike Twitter and Facebook comments on the service are very positive such as *great (179 occurrences), good (167), friendly (126), excellent (101), amazing service (81), helpful (43), nice (36), perfect (24), fantastic (21), professional (20)* The aspect "Path" embrace path, tour, route and trip concepts and is the best qualified aspect with 8152 occurrences. About the path is qualified such as *great (634), good (515), excellent (212), friendly (171), wonderful (159), nice (137), fantastic (127).* Some remarkable is that aspect "Guide" is the second best qualified with 2,741 occurrences. Note that there are almost no incidences in the comments, only 4 occurrences have been found with the "Incidence" aspect.

In Facebook and Twitter, the worst rated aspects are the maintenance, the amount and condition of the stations and docks, the amount and condition of bikes

and the schedule. It is remarkable that incidences caused by poor maintenance has 5 times more mentions than the other aspects.

Sentiment analysis detects negativity related to service, the status and number of stations, maintenance of stations and bikes, the docking system and number of docks and computer system to manage the service. Additionally, but with less relevance, there are some complains about bike paths. In general, there are many incidents, failures that are not managed efficiently; the user is redirected to complain on the website instead of trying to solve the problem. There is also an increasing demand requesting night time service.

The price of the service obtains a positive polarity from the perspective of users and company tweets. This difference can be made in Facebook and Twitter because the observed companies or organizations are identified. The polarity and adjectives of each group have been analysed. The tweets of the company are graded with the following adjectives: *competitive, incredible, interesting, very special, super promotional, very good bargain*. Users' tweets rate the price as *appropriate, very good price, pretty cheap, good price, very good, inexpensive, very reasonable,* etc.

Moving to the positive part, the most highly valued aspects are the price and the experience of cycling. The systems that provide electric bikes have remarkable positive results as Urbanbike in Bilbao and Elecmove in Seville.

The analysis of 2010–2016 data shows that in the 2010–2013 period the major part of the comments about schedule, maintenance, service and price are posted by companies like information messages. As a result, the sentiment analysis is neutral. Conversely, in the 2014–2016 period there is more interaction from users complaining about mentioned aspects or expressing positive opinions about price and experience. This interaction enriches sentiment analysis providing positive and negative polarities.

6 Conclusions

This paper analyses the PBS in Spain using social media data with opinions of residents and visitors, identifying positive and negative factors and their potential impact in sustainable tourism and transport.

Sentiment analysis results detected that infrastructures are the main negative aspects related to PBS, highlighting that the state or lack of bike paths is a common issue. The unreliability of the system is indicated by 16.4% of users. That is, those people would be willing to take more often public bicycles if the anchors (docks) were available and working properly. Sentiment analysis uncovers negative aspects regarding dockings, state and maintenance of bikes and stations that often are closed. The system unavailability is intrinsic to the PBS systems. However, the unavailability can be caused by peaks of stationary demand not taken into account that should be handled by the managers of the system. With 8.5%, the density of stations is a subject to improve. Often the urge to expand into surface leads some systems to increase the distance between stations and consequently users may have

to leave the bike too far from the end destination or if the station is full or empty search for farther stations. This is a somewhat technical issue and therefore could expect a lower awareness of the problem by the user. Sentiment analysis shows that there is an issue with the number of stations and the reach of the urban area.

Thanks to sentiment analysis it can be concluded that a key factor for success of this initiatives of bike-sharing system in any city is that there must be a good balance of 5 key components as the station density (the spacing between stations and a convenient walking distance from each station to any point in between), bikes per resident (bikes available during peak demand periods), coverage area (to contain a significant number of user origins and destinations, the availability of an extensive and continuous bike path), quality bikes (be in good condition, well maintained,..), easy to use the stations (easy process to checking out, friendly payment interface, real-time monitoring of occupancy, available web site, …).

On the other hand, bike-sharing systems are evolving rapidly to fit the needs of this century, because traffic congestion worsens, populations grow. This system is a mode of transport to move people in more efficient, economically feasible way. Besides, the bicycle is considered an important transport mode to bring sustainability within unsustainable daily routines of short urban journeys. But in fact, in the research results described in this paper are identified many problems grouped in these five key components described in the preceding paragraph, that many users do not use this transport mode.

According to sentiment analysis price is the best rated aspect. This result corroborates the fact that price is one of the positive factors that leverages the use of PBS. The insufficient timetable is uncovered as well as one of the main barriers to use the system by some users. This fact should be considered by PBS managers in order to fulfil the requirements of potential users.

An action to increase bike usage could be the electric bike due to the obtained ratings from users regarding experience. The electric bike and the bike path are meant to be key factors to become PBSS a trendy type of transport for a wider proportion of citizens, as physical condition and biking skills loose importance.

These findings show that tourism, transport and mobility infrastructures as bike paths, stations, timetable, eBike provision… need a coordinated planning as they are intrinsically related. The type and focus of discourse has to be with the type of social media. In this sense, as TripAdvisor is a network of travellers, it makes sense that the highlight is the experience and the person who helps building that experience, the guide. Positive and memorable experiences have an important presence in TripAdvisor. In Twitter and Facebook users in general are local users writing daily experiences. In TripAdvisor incidents are almost non-existent. The type of discourse does not depend only on the type of user but on the channel. Significantly, the comments of TripAdvisor are mainly positive. The experience usually depends on the type of user, i.e. daily user or tourist, since for the latter ones are mainly leisure experiences, which means better organization with a guide and other facilities that make the user enjoy the destination.

The results of the research are potentially useful for policy and decision making related to the sustainable mobility of people in urban areas and urban transport. This

investigation demonstrates that information harvested from Social Media can complement, enrich (or even replace) traditional data collection as the results using both methods enrich each other. The availability of continuous Social Media data would allow to monitor the quality of the PBS systems, and to update demand prediction models. In this way, public and private investments in PBS systems could be more efficient.

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Use of Bitcoin in Online Travel Product Shopping: The European Perspective

Daniel Leung and Astrid Dickinger

Abstract Bitcoin, a cryptographic currency invented by Satoshi Nakamoto, has been increasingly embraced by consumers as an online payment method since its introduction. Though an increasing number of tourism enterprises start offering Bitcoin as a payment option, Bitcoin has not yet been subjected to rigorous scientific scrutiny. This exploratory study purports to investigate the Bitcoin usage experience in and Bitcoin usage intention for shopping travel product online by European travellers. Drawing on the responses provided by 138 European travellers, the results exhibit that the penetration of Bitcoin usage in online travel purchase among European travellers is tentatively not prominent. Respondents however reported that they will purchase some travel products and particularly restaurant and food delivery online using Bitcoin in the future. The findings are helpful for tourism and hospitality operators by informing their decision making of whether an investment should be made in order to accept Bitcoin as a payment option.

Keywords Bitcoin · Financial technology · Technology adoption · Motivators · Inhibitors

1 Introduction

As envisioned by Werthner and Klein (1999) 17 years ago, the rapid development of information and communication technologies in general and Internet technology in particular have led to the great popularity of electronic commerce (eCommerce) activities in travel and tourism. A recent survey conducted with over 34,000

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travellers reports that around two-third of worldwide travellers, regardless of generations, book accommodation via online channels for their last vacation (Ipsos, 2015). Though researching and purchasing travel products online are now becoming the mainstream trend, many travellers still prefer the webrooming mode (i.e., look up a product online but then buy it in a physical store) due to the anxiety of payment security, privacy infringement and other potential risks (Brown, Muchira & Gottlieb, 2007; Morrison, Jing, O'Leary & Cai, 2001). Indeed, security risk and privacy risk have long been reported as major impediments discouraging one's intention to purchase tourism services online (Kolsaker, Lee-Kelley & Choy, 2004; Lin, Jones & Westwood, 2009). Given that credit cards now serve as the primary payment method for online travel purchase, nevertheless, billions of dollars are lost annually due to fraudulent credit card transactions (Mahmoudi & Duman, 2015). The loss aversion of human nature indirectly leads to the reluctance to purchase travel products online by at least some travellers.

With credit card fraud being rampant, many emerging financial technologies and payment methods were introduced to support the development of eCommerce over the past few years. Mobile payments, including short messaging services based transactional payments, direct mobile billing and mobile wireless application protocol (Tan, Ooi, Chong & Hew, 2014), are one of the two emergent financial technologies considering the phenomenal growth in mobile technologies. Thanks to the emergence of new applications like Apply Pay, Google Wallet and Visa payWave, near field communication mobile payment (NFC-MP) has recently received much scholarly attention from researchers in the disciplines of tourism and information systems (Morosan & DeFranco, 2016; Ooi & Tan, 2016). Leong, Hew, Tan and Ooi (2013) note that the levels of convenience and security of NFC-MP are prominent since signature is not required during the payment process. Due to its prominence and potential, Idate (2014) estimates the volume of NFC-based transactions will rise from EUR 4.6 billion in 2014 to EUR 53.8 billion in 2018.

Cryptographic currencies and particularly Bitcoin are another emergent financial technology that has gained significant acceptance (Polasik, Piotrowska, Wisniewski, Kotkowski & Lightfoot, 2015). Invented in 2007 by Satoshi Nakamoto, Bitcoin is an open source payment system using a decentralized peer-to-peer network. Unlike currencies which are backed by precious metals that would guarantee its value, Bitcoins are nothing more than amounts associated with unique strings of letters and numbers. Despite the absence of legal guarantee of acceptance by governments or central authorities, Bitcoin acceptance and usage continue to grow since the European Union recognized Bitcoin has an equal footing with mainstream currency (Bodoni & Thomson, 2015). Blockchain Luxembourg (2016) reports that the number of users who own a blockchain wallet increases 25 times from 0.3 million to 7.7 million between June 2013 and June 2016. As of February 2015, more than 100,000 merchants accept Bitcoins as a payment method. These include international online travel agencies and tourism enterprises such as CheapAir, Expedia, MGM Resorts (Cuthbertson, 2015). A recent news clip from Merkle (2016) notes that many convenience stores and accommodations in Taiwan accept Bitcoin as currency.

Low transaction cost is one possible explanation for the increasing adoption by merchants. Goldman Sachs (2014) researches and reports that direct acceptance at the Bitcoin address of the store does not involve any fee, and the cost of accepting Bitcoin through a payment service provider is 1% of transaction value. Comparing with credit card (about 3% of transaction value) and PayPal (about 4% of transaction value), accepting Bitcoin as payment method can effectively help enterprises save transaction costs. Bitcoin's high level of anonymity is another reason for the increasing uptake, as user wallets are not directly connected to their owners by identity information (Polasik et al., 2015). Although Bitcoin and mobile payments are commonly acknowledged as an innovative and emerging financial technology, in comparison with mobile payments, Bitcoin has not yet been subjected to rigorous scientific scrutiny.

Alike other new technologies, the success of Bitcoin is dependent on the consumers' uptake because merchants will be discouraged from investing on Bitcoin without a critical mass of consumers. Despite the fact that Bitcoin has been increasingly employed as an emergent payment system for eCommerce transactions, to the best of the authors' knowledge, an empirical investigation that explore how users leverage and intend to embrace this emerging payment method is absent but urgently needed. As noted earlier, an increasing number of tourism and hospitality enterprises start offering Bitcoin as a payment option. This necessitates an empirical inquiry of exploring consumers' likeliness and intention to use Bitcoin as a payment option in online travel purchase. Noticing this research void, this exploratory study aims at examining European travellers' Bitcoin usage experience in and Bitcoin usage intention for online travel product shopping. This study focuses on the perspective of European travellers because Bitcoin's acceptability becomes a matter of prime interest among Europeans since the European Union recently recognized Bitcoin has an equal footing with mainstream currency (Bodoni & Thomson, 2015). Drawing on the quantitative data solicited from a survey with European travellers, another objective of this study is to identify motivators and inhibitors of embracing Bitcoin as their online payment method by European travellers. The research findings are expected to be helpful for tourism and hospitality organizations by informing their decision making of whether an investment should be made in order to accept Bitcoin as a payment option.

2 Literature Review

2.1 Bitcoin

Bitcoin has emerged as the most successful cryptographic currency in history, says Bonneau and colleagues (2015). The word Bitcoin consists of two English terms. The first part "bit" refers to the smallest unit of data in computing and digital communication, and the second part "coin" is simply the English word for coins.

Though Bitcoin is commonly known as an invention made by Satoshi Nakamoto in 2007, the name is widely considered to be a pseudonym and the real identity of the inventor of Bitcoin continues to remain a mystery 9 years after it was introduced (Subramanian & Chino, 2015). The only thing verifiable is that Bitcoin emerged in 2007. Anonymous users have registered a uniform resource locator called "anonymousspeech.com" with a domain name of "Bitcoin.org" in 2007. Journalists of *The New Yorker* and *Fast Company Magazine* came up with some information after making a great effort on their investigation. According to their descriptions, a patent was registered in the United States which carries the title "Updating and Distributing Encryption Keys" before the registration of the abovementioned uniform resource locator. The journalists found out several names within this registration, including Neal King, Vladimir Oksman and Charles Bry. Unfortunately, the exposure of these names and details did not produce further results and the origin of Bitcoin still remains a mystery at the moment of this writing (Mago, 2016). Despite its mysterious historical background, the number of Bitcoins in circulation and its economic value is stable in the first 5 years after its launch. Till the beginning of 2013, Bitcoin's real world value rises as people start trading it for goods, services and other currencies. As at July 2016 (Blockchain Luxembourg, 2016), over 15 million Bitcoins are in circulation and each Bitcoin has a market price of approximately USD 650.

The growing success of Bitcoin has attracted people's attention towards the mechanism of Bitcoin. As described by Subramanian and Chino (2015), Bitcoin can be considered as a sequence of transactions between buyers and sellers. In brief, Bitcoin units come into a designated address representing sellers, and these units can then be transferred to another address representing buyers. If a seller wants to transfer Bitcoin units to a buyer, the seller needs to know the Bitcoin address of the buyer. Sellers should also include their own Bitcoin address as part of the transaction, so that buyers can verify the identity of sellers who made the transfer. All verified transaction records are available in a block-chain of transactions. Block-chain, serving as the public ledger, can assist buyers in verifying the authenticity of seller's Bitcoins which he/she transferred. The veracity of the transactions is verified by other members in the Bitcoin peer-to-peer network, and these people are called miners. The major roles of miners are twofold. They firstly examine each transaction and ensure that it meets certain conditions or criteria given in the Protocol Rules. Afterwards, miners would group a set of transactions into a block-chain. To formulate a block-chain, miners need to create a new block and then add the hash of the previous block as well as a hash of a bunch of transactions (also named Merkle Root). Later on, a new block-chain would be created after a transaction is released into the peer-to-peer network and verified by other miners in the network.

Bitcoin is a great way for businesses to minimize transaction fees. In addition to the absence of chargebacks and tax liabilities, no upfront cost is involved in accepting this payment method (Koller & Seidel, 2014). Several scholars note the shortcomings of Bitcoin. Subramanian and Chino (2015) note that owners' Bitcoin can still be stolen by professional hackers though the stealing process requires much

computational power. A recent article in *Science* also suggests that the design of block-chain may allow someone to trace the money flow (Bohannon, 2016). Yet, considering the absence of valid evidence, it is believed that the Bitcoin transaction is highly secure because the mechanism is designed to blur the correspondence between transactions and Internet Protocol addresses. While addresses of the two entities are visible in the network, no personal data is required to register an address and the address is not directly connected to owner's identity information. Since the true identities of owners remain hidden, there is no forensic trail that can trace the owners (Bohannon, 2016; Polasik et al., 2015).

2.2 Previous Research on Bitcoin

Bitcoin has been intensively documented in both industry and academic literature, even though there is a noticeable lack of empirical research in its early phase. Early studies on Bitcoin primarily focus on introducing its mechanism and uniqueness in the forms of books or book chapters (e.g., Nakamoto, 2008). Starting from year 2011, an increasing amount of discussions on Bitcoin emerged in academic conferences and academic journals. Legality of Bitcoin is the matter of prime interest by researchers during that phase. Grinberg (2011) studies and acknowledges that Bitcoin can potentially be used to make micropayments because of its low transaction costs. He, however, discusses several legal issues relating to Bitcoin owing to Bitcoin's uncertain legal status. Jacobs (2011) also discusses some legal issues (e.g., liability) related to financial regulatory aspects about electronic cash and particularly Bitcoin.

Issues pertinent to the security and privacy of Bitcoin system becomes scholars' primary concern since 2013. Reid and Harrigan (2013) testify the anonymity of Bitcoin system with the help of external information and multiple techniques like network analysis and flow analysis. Androulaki, Karame, Roeschlin, Scherer and Capkun (2013) also empirically evaluate the privacy provided by Bitcoin via analysing the genuine Bitcoin system as well as testing through a simulator. Their empirical findings offer insightful implications on the privacy of Bitcoin system because around 40% of users' profiles could be retrieved albeit users adopt privacy measures recommended by Bitcoin. In recent years, more research effort has been dedicated to explore the coming impact of Bitcoin on financial services and regional economy (Fanning & Centers, 2016; Gopalkrishnan & Hammond, 2015). Though a plethora of research emerge over the past few years, extant studies generally focus on the system aspect and they are mostly conducted from the supplier's perspective (e.g., Polasik et al., 2015). On the contrary, few studies have been conducted from the consumer's perspective and scholarly attention on user experience or perception toward Bitcoin usage is surprisingly scarce (Khairuddin, Sas, Clinch & Davies, 2016).

Contrasting with other disciplines, Bitcoin has remained under-investigated in tourism and hospitality research despite its increasing adoption by tourism

suppliers. Sigala (2015) is one of the few tourism scholars who acknowledge the business potential of Bitcoin. In her study themed collaborative commerce in tourism, she notes that Bitcoin can serve as a form of payment to support customer-to-customer collaborative commerce but additional research is needed to investigate the strategies for institutionalizing this business model. Gössling (2016) as well as Lub, Rijnders, Caceres and Bosman (2015) also discuss the potential of Bitcoin in their latest works. Yet, all of the abovementioned studies offer general discussion on usage of Bitcoin in the tourism context while empirical investigation is largely absent. In other words, an answer to the question of "how consumers leverage and intend to embrace Bitcoin as a payment option in online travel purchase?" is still unknown yet.

2.3 *Factors Affecting Consumers' Adoption of Electronic Payment Technologies*

In line with the prevalence of eCommerce, the examination of consumers' adoption of eCommerce in general and electronic payment technologies in particular has been extensively catalogued in business, information systems and tourism journals (Özkan, Bindusara & Hackney, 2010). Generally speaking, consumers consider major advantages of electronic payment technologies to be convenience and flexibility compared to traditional counterparts. Security, trust and privacy are still hindrance slowing down consumer acceptance and adoption (Sumanjeet, 2009). A number of conceptual frameworks were postulated in prior studies to predict consumers' intention to adopt electronic payment technologies. He and Mykytyn's (2009) framework suggests that customer's adoption of online payment systems is influenced by perceived benefits and risk of the system, vendors' service and website features as well as customers' demographic profiles and Internet usage experience. Combining six critical factors from technology acceptance model and theory of reasoned action, the empirical findings in Özkan and colleagues' (2010) study exhibit that customer intention to adopt an electronic payment system is associated with their perceived security, perceived advantage as well as whether the system uses web assurance seals.

The growing popularity of mobile payment provides synergy for academic researchers in exploring consumers' adoption of mobile payment. Yang and colleagues (2012) report that consumers' behavioural beliefs in combination with social influences and personal traits are significant determinants affecting their mobile payment services adoption and use. However, the influence on one's behavioural intention vary between pre-adoption and post-adoption phases. Ooi and Tan (2016) recently propose an integrated model to assess mobile users' likeliness to adopt NFC-MP. Drawing on the analysis of responses provided by Malaysia mobile users, perceived mobile usefulness has proven to be a predictor of mobile users' intention to use NFC-MP. Grounded on the Unified Theory of Acceptance

and Use of Technology, Morosan and DeFranco (2016) reveal that performance expectancy, hedonic motivations, habit, and social influences were significant predictors of consumers' intention to use NFC-MP in the hotel setting. Besides enriching the understanding of adoption mechanism of proximity payments, Morosan and DeFranco's study provides hoteliers with actionable solutions for leveraging NFC-MP conveniently in transactions during consumers' hotel stays.

3 Methodology

To examine European travellers' Bitcoin usage experience in and Bitcoin usage intention for online travel product shopping, a survey instrument with four sections was developed for soliciting responses from European travellers.

One qualifying question, asking if respondents have a leisure trip over the past twelve months, was firstly asked to verify respondents' eligibility. The first section with four questions is designed to investigate respondents' Bitcoin usage experience. The first question is "Have you ever used Bitcoin before?" and dichotomous scale is used [0: No; 1: Yes]. The second (Have you ever used Bitcoin (as a payment method) for online shopping before?) and third (Have you ever used Bitcoin (as a payment method) for online travel product shopping before?) questions are exclusive to those who used Bitcoin before, and dichotomous scale is used [0: No; 1: Yes]. In the last part of the first section, those who used Bitcoin for online travel purchase before were asked to indicate the type(s) of travel product they purchased and paid by Bitcoin before. Seven travel product types which are adapted from Card, Chen and Cole's (2003) study (including accommodations, airlines, car rentals, travel packages, tickets for attractions, tickets for events and tickets for transportations) were offered for selection, and respondents could name new product type(s) in "Others" option.

The second section with three questions is set to examine respondents' usage intention for online travel product shopping. Respondents were firstly asked to indicate their familiarity with the studied subject using a 10-point Likert scale [1: very unfamiliar; 10: very familiar]. The second question is "How likely are you going to use Bitcoin for shopping travel product online in the coming 12 months?", and a 10-point Likert scale [1: very unlikely; 10: very likely] is employed. Respondents were then asked to indicate all types of travel products they are likely to purchase and pay by Bitcoin. Similarly, the aforementioned seven options were offered for selection and respondents could add new product type(s).

The third section commences with asking respondents to identify factors that may motivate them to use Bitcoin in online travel purchase. Five positive aspects of Bitcoin were offered based on a comprehensive review of literature (e.g., Polasik et al., 2015; Subramanian & Chino, 2015). These include (1) Bitcoin works anywhere and anytime, (2) Bitcoin payment does not require pin or signature for verification, (3) Bitcoin account is not connected to owner's identity information, (4) Establishment of Bitcoin account does not require a credit card or a bank

account, and (5) Lower transaction cost is involved in Bitcoin payment than other electronic payment systems. Respondents could select any (or none of) applicable options and additional factor(s) could be suggested. The second question in the third section is to identify factors that may discourage them to use Bitcoin in online travel purchase. Five major concerns about Bitcoin adoption were suggested on the basis of literature review. Respondents could suggest new factors and/or select any (or none of) applicable options including (1) Lack of knowledge about Bitcoin, (2) Lack of retailers accepting Bitcoin as a payment method, (3) No legal guarantee of acceptance, (4) Abnormal chargeback mechanism, and (5) High risk of loss in value. The fourth section with six questions records respondents' gender, age, nationality, monthly household disposable income, Internet usage experience and online purchasing experience.

Two experienced academics in tourism and information systems fields were invited to review and verify the questionnaire prior to the main survey. A pilot test was also conducted with five graduate students from two universities in Central Europe to guarantee the content validity of the questionnaire. No major change was made except some minor corrections in wordings. The main survey was conducted between April and May 2016. Two undergraduate students were recruited as interviewers, and the street-intercept survey was conducted with European travellers at two tourist spots in Vienna (Austria) using convenience sampling. In total, 150 questionnaires were collected and twelve invalid samples were excluded for analysis due to incomplete information. This yields a valid response rate of 92% (N = 138). Table 1 exhibits the demographic profile of the respondents.

Table 1 Respondents' demographic profile

		Freq.	%		Freq.	%
Gender	Male	81	58.7	Female	57	41.3
Age	15–30	57	41.3	46–65	29	21.0
	31–45	38	27.5	66 or above	14	10.2
Monthly household disposable income	2000€ or less	36	26.1	3001€–4000€	32	23.2
	2001€–3000€	31	22.5	4001€ or above	39	28.3
Nationality	Austria	64	46.4	Italy	11	8.0
	Germany	18	13.0	France	9	6.5
	Switzerland	16	11.6	Others	20	14.5
Internet usage experience	1–2 years	4	2.9	7–8 years	26	18.8
	3–4 years	12	8.7	9 years or above	77	55.8
	5–6 years	19	13.8			
Online purchasing experience	Never	9	6.5	11–15 times	12	8.7
	1–5 times	21	15.2	16 times or above	69	50.0
	6–10 times	27	19.6			

4 Findings and Discussions

4.1 Bitcoin Usage Experience

Table 2 exhibits the descriptive statistics pertinent to respondents' Bitcoin usage experience. To the question of "Have you ever used Bitcoin before?", around two-third (64.5%, n = 89) of the respondents have not used Bitcoin before. Though more than one-third (35.5%, n = 49) claimed that they have used Bitcoin prior to their participation in the survey, the results still reflect the penetration of Bitcoin usage among European travellers is not prominent. Among those who have used Bitcoin before, over 70% have used Bitcoin for online shopping before (73.5%, n = 36). Surprisingly, around 60% of them have used Bitcoin for shopping travel products online before (59.2%, n = 29). Scholz and Smith (2016) suggest that early adopters of new technologies are important since they can help diffuse technologies. This study reveals that early adopters of Bitcoin in online travel purchase are mainly aged 15–30 (37.9%), male (69%), having higher level of Internet usage experience (9 years or above: 65.5%) and online purchasing experience (16 times or above: 65.5%).

Limited types of travel products have been purchased and paid by Bitcoin among Bitcoin adopters surveyed. Six respondents reported that they settled the bill for accommodation by Bitcoin (20.7%). Five respondents noted that they reserved and paid the airline tickets by Bitcoin (17.2%), and three purchased travel packages using Bitcoin (10.3%). In addition to those eight available options, nine respondents named "Restaurant and food delivery" in the "Others" option (31%) which makes it become the most popular type of travel product respondents shopped and paid by Bitcoin. This result reveals that Bitcoin is tentatively more leveraged (as a payment option) in the restaurant sector, in comparison with other tourism sectors.

Table 2 Respondents' Bitcoin usage experience

Bitcoin usage experience	Yes	%	No	%
	Freq.		Freq.	
Usage experience				
Used Bitcoin before (N = 138)	49	35.5	89	64.5
Used for online shopping before (n = 49)	36	73.5	13	26.5
Used for online travel product shopping before (n = 49)	29	59.2	20	40.8
Travel product type				
Others: restaurant and food delivery (n = 29)	9	31.0	20	69.0
Accommodations (n = 29)	6	20.7	23	79.3
Airlines (n = 29)	5	17.2	24	82.8
Travel packages (n = 29)	3	10.3	26	89.7
Car rentals (n = 29)	0	0	29	100
Tickets for attractions (n = 29)	0	0	29	100
Tickets for events (n = 29)	0	0	29	100
Tickets for transportations (n = 29)	0	0	29	100

4.2 Bitcoin Usage Intention

Pertaining to respondents' likeliness of using Bitcoin for shopping travel product online in the coming 12 months, the average rating provided by all respondents is 3.77 with the standard deviation of 2.86 [1: very unlikely; 10: very likely]. This figure reflects that those participating European travellers are not in favour of and less likely to use Bitcoin for online travel product shopping in the near future. Wöber and Gretzel (2000) posit that individuals who have better knowledge in the subject field would have fewer cognitive barriers in adopting new technology. Considering that the average rating of their self-reported familiarity with Bitcoin is relatively low (mean = 4.31; standard deviation = 2.79 where 1: very unfamiliar; 10: very familiar) and the correlation test result exhibits there is a positive relationship between respondents' level of familiarity and their likeliness of future use ($r = 0.46$, $p < 0.01$), echoing Wöber and Gretzel's (2000) assertion, lack of knowledge about Bitcoin is one possible explanation for non-adopters' reluctance to embrace Bitcoin.

To the travel product types respondents are likely to purchase and pay by Bitcoin, no particular product type was chosen by more than one-third of all respondents. As shown in Table 3, "Restaurant and food delivery" (25.4%, n = 35) receives the highest number of votes by respondents. As the cost of "Restaurant and food delivery" is limited comparing with that of other options, its low level of potential financial loss may be the possible reason why respondents do not mind attempting to settle restaurant or food delivery bill using Bitcoin in the coming future. "Accommodation" (18.1%, n = 25) is the second most selected product types respondents are likely to shop online and pay by Bitcoin, which are followed by "Airlines" (13.8%, n = 19) and "Car rentals" (11.6%, n = 16). Alike the findings of Bitcoin usage experience, the participating European travellers prefer using Bitcoin in restaurant and food delivery to other travel products. This offers vital managerial implications to restauranteurs in the matter of whether an investment deserves to be made in order to accept Bitcoin as a payment option.

Table 3 Respondents' Bitcoin usage intention

Bitcoin usage intention	Yes	%	No	%
	Freq.		Freq.	
Travel product type				
Others: restaurant and food delivery	35	25.4	103	74.6
Accommodations	25	18.1	113	81.9
Airlines	19	13.8	119	86.2
Car rentals	16	11.6	122	88.4
Tickets for attractions	14	10.1	124	89.9
Tickets for events	9	6.5	129	93.5
Travel packages	8	5.8	130	94.2
Tickets for transportations	5	3.6	133	96.4

4.3 Motivators and Inhibitors

To the question about factors that may motivate respondents to use Bitcoin in online travel purchase, all participating respondents selected at least one factor in their response and the descriptive statistics were exhibited in Table 4. The highly secure feature of Bitcoin is found to be a key motivator, since nearly half of all respondents chose the option "Bitcoin account is not connected to owner's identity information" (45.7%, n = 63). Bitcoin's wide universality (i.e., "Bitcoin works anywhere and anytime") is another key motivator that may encourage consumers to use Bitcoin in online travel purchase (41.3%, n = 57). It is surprising that the convenience feature of Bitcoin was not frequently chosen (21.7%, n = 30). It can be explained by the fact that respondents have scant knowledge about Bitcoin's mechanism as well as its unique way of verification without using pin or signature.

Regarding the inhibitors, over 60% of respondents (60.1%, n = 83) reported that "Lack of knowledge about Bitcoin" is the major impediment discouraging them to use Bitcoin in online travel purchase. "Lack of retailers accepting Bitcoin as a payment method" was another key factor, as 42.8% (n = 59) of respondents opted this as an inhibitor. More than a quarter of respondents selected "High risk of loss in value" (31.2%, n = 43) and "No legal guarantee of acceptance" (25.4%, n = 35), while only 22 respondents selected "Abnormal chargeback mechanism" (15.9%).

Table 4 Factors affecting consumers' usage of Bitcoin in online travel purchase

Factors	Freq.	%
Factors encouraging consumers to use		
Bitcoin account is not connected to owner's identity information	63	45.7
Bitcoin works anywhere and anytime	57	41.3
Establishment of Bitcoin account does not require credit card/bank account	55	39.9
Lower transaction cost is involved in Bitcoin payment than other systems	46	33.3
Bitcoin payment does not require pin or signature for verification	30	21.7
Factors discouraging consumers to use		
Lack of knowledge about Bitcoin	83	60.1
Lack of retailers accepting Bitcoin as a payment method	59	42.8
High risk of loss in value	43	31.2
No legal guarantee of acceptance	35	25.4
Abnormal chargeback mechanism	22	15.9

5 Conclusions and Future Research

Being one of the first academic literature examining consumers' Bitcoin usage experience and Bitcoin usage intention in online travel purchase, the present study expands the current knowledge base by revealing "how European travellers leverage and intend to embrace Bitcoin as a payment option in online travel purchase?". Drawing on the analysis of survey responses, the penetration of Bitcoin usage in online travel purchase among European travellers is found to be not prominent at present. Those European travellers who participated in the survey also reported that they are less likely to use Bitcoin for shopping travel product online in the coming future, probably due to their lack of knowledge about Bitcoin. But still, respondents indicate that they will consider shopping some travel products and particularly restaurant and food delivery online using Bitcoin. This finding is expected to be helpful for tourism and hospitality operators by informing their decision making of whether an investment should be made in order to accept Bitcoin as a payment option.

Advancing the understanding about factors affecting consumers' usage Bitcoin in online travel purchase is another key takeaway from this study. Based on the findings, enriching consumers' knowledge about the mechanism of and benefits brought from Bitcoin is the leading action that vendors (who accept or plan to accept Bitcoin as the payment method) should take if they desire to encourage consumers to embrace this emerging financial technology. Instead of highlighting the convenience and other features of Bitcoin, vendors should emphasize Bitcoin's highly secure feature since it is a key motivator rated by consumers. Vendors should primarily target those early adopters of Bitcoin in online travel purchase, who are mainly aged 15–30, male, having higher level of Internet usage experience and online purchasing experience, since they can help diffuse technologies and share word-of-mouth. While this study provides certain insights for academics and practitioners in the field, subsequent researchers are advised to generalize the findings with cautious due to the small sample size (i.e., 138) and the limited geographical coverage of respondents (i.e., Europe). A natural extension of the current study is to replicate the study with a larger group of travellers from various age groups and nationalities.

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Attitudes Toward Autonomous on Demand Mobility System: The Case of Self-Driving Taxi

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Abstract Self-driving cars are ready to serve customers, but previous studies found that the general public is still cautious to ride in autonomous vehicles. This study investigated the influence of attitude and trust in technology on intention to use self-driving taxi. Based on a survey with 325 residents in the United States (US), this research found low level of negative attitude towards technology (computers and robots) and high level of trust in autonomous vehicles. The likelihood of using self-driving taxi at home (as residents) and for travel (as tourists) is negatively influenced by perception that technology is dehumanizing and positively by expectations of reliability, functionality, and helpfulness of self-driving taxi. The analysis also revealed the effects of current patterns of mobility and innovativeness on intention to use self-driving taxi.

Keywords Technophobia · Self-driving car · Autonomous vehicle · Smart travel · On demand mobility · Uber

1 Introduction

Recent years have been witnessing a race to bring intelligent self-driving vehicles on the roads, with Google's self-driving car project being a prime example. Equipped with artificial intelligence and robotic technology, self-driving cars are

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designed to efficiently and safely navigate through city streets, sensing and processing relevant information from the surroundings to mitigate traffic delays and accidents without human assistance (Sanchez, 2015; Thrun, 2010). As a result, the use of self-driving cars is said to reduce traffic congestion and critically enhance passenger safety (Ross, 2014). Adding autonomous vehicles to city streets implies changes in infrastructure (e.g., internet-of-things, smart systems) and personal travel behaviour (Fagnant & Kockelman, 2015; Hars, 2015; Lenz & Fraedrich, 2016; Pavone, 2016), bringing us closer to the realisation of smart cities/smart destinations (Guo, Liu, & Chai, 2014; Xiang, Tussyadiah, & Buhalis, 2015).

The use of autonomous vehicles is not only beneficial for its sustainability through reduced ecological footprints of mobility (i.e., commuting and tourism), but also for its efficiency in resource utilization as it provides new opportunities for car sharing models by decoupling two resources: drivers and vehicles (Beiker, 2016; Hars, 2015; Lenz & Fraedrich, 2016; Pavone, 2016). Uber added self-driving cars to serve its customers in Pittsburgh in August 2016 (Mitchell & Lien, 2016), marking the first move to the implementation of autonomous on demand mobility system. Customers requesting a ride via Uber app will be paired with self-driving cars at random. These cars are equipped with self-driving kits and will be supervised by humans in the driver's seat for the time being, satisfying the category of autonomy level 3 according to the National Highway Traffic Safety Agency (NHTSA), but are expected to be fully autonomous (level 4) by 2021 (Chafkin, 2016).

With on-demand self-driving taxi service coming to operation, adoption rate by residents and tourists remains a critical issue to assess its success and shape its future. Despite the benefits, concerns about autonomous technology continue to intensify amongst the general public, causing resistance to autonomous vehicles (Schoettle & Sivak, 2014, 2015). These concerns are oftentimes rooted in fear of technology following its own course, independent of human direction (Dietterich & Horvitz, 2015) and hesitation to give up autonomy and control of an important aspect of human life to a machine (Glancy, 2012). The use of autonomous vehicles also implies diminishing demand for professional drivers (Ross, 2014), resulting in technology being perceived as dehumanizing. In order to identify a priori acceptance of self-driving taxi service, this research examines consumers' general attitudes toward technology and how it influences the likelihood of using self-driving taxi at home (as residents) and while traveling (as tourists). The findings will lay a foundation to better understand consumer behaviour with regards to the use of autonomous vehicles for personal travel, which will assist policymakers, including tourism destinations, and relevant travel businesses in strategic implementation of autonomous on demand mobility system.

2 Attitudes Toward Self-Driving Cars: Concept and Measurement

Autonomous technology paves the ways for the future of transportation and mobility. However, the general public are still very cautious about it. Pew Internet found that 48% internet users in the US indicated interest in self-driving cars (Smith, 2014), while American Automobile Association (AAA) reported that 75% US drivers feel afraid to ride in self-driving cars (Hsu, 2016). Surveying consumers in China, India, Japan, the US, the United Kingdom (UK), and Australia, Schoettle and Sivak (2014) found that while consumers showed high levels of interest and expectations about the benefits of self-driving vehicles, they also expressed high levels of concern about autonomous cars not driving as well as human drivers. More recently, Schoettle and Sivak (2015) revealed that full-autonomous mode of transportation is the least preferred by US motorists. As the success of autonomous on demand mobility system depends on the widespread adoption of autonomous vehicles on the road, it is important to advocate the public to learn to trust such robotic vehicles (Hsu, 2016). In order to predict the adoption rate of self-driving taxi, a better understanding of the general attitude toward and trust in autonomous vehicles is essential.

Negative attitudes toward technology. Studies confirm that some consumers demonstrate resistance to technology, resulting in avoidance of new technological innovation. A large body of literature conceptualizes the term technophobia (i.e., fear of technology) to explain the negative affective and attitudinal response to new technology (e.g., Brosnan, 1998; Rosen & Weil, 1990). While it has been applied mainly for computers, the concept is relevant to explain aversion to current technological trends, such as fear of artificial intelligence, robotics, drones, and self-driving cars (Dietterich & Horvitz, 2015). Rosen and Weil (1990) define technophobia to include one or more of the following: (1) anxiety about current or future interactions with technology, (2) negative global attitude toward computing technology, including the societal impacts of its operation (e.g., fear that technology will steal human jobs and destabilize society), and (3) specific negative cognition while interacting with or thinking about technology. Technophobia has been found to have adverse effects on acceptance of and performance with computer technology (Brosnan, 1998). Therefore, it is proposed that general aversion to technology (i.e., negative attitude) is a detriment to technology adoption in the case of self-driving cars.

Hypothesis 1 Negative attitude toward technology has a negative effect on intention to use self-driving taxi.

Various scales have been developed to measure technophobia as general attitude toward technology, including Computer Attitude Scale (CAS) (Nickell & Pinto, 1986) and Negative Attitudes toward Robots Scale (NARS) (Nomura, Kanda, & Suzuki, 2006). While researchers refer to self-driving cars as robotic cars or robocars (Ross, 2014; Thrun, 2010), it is largely unknown whether people associate

autonomous cars as robots or as computers and if they would respond differently to different terms (i.e., if fear of robots is higher than that of computers). As suggested by Sanchez (2015), language plays a role in instilling perception of technology. To that end, this study measures aversion to computers and compares it with that to robots.

Trust in Technology. Trust has been identified to have strategic importance in understanding consumer acceptance of automated technology (Tay, Jung, & Park, 2014). Similar to trust within inter-personal exchanges (e.g., trust in suppliers), consumers place a significant level of trust in technological artefacts during human-technology exchanges, such as in online recommendation agents (Wang & Benbasat, 2005). This is called "trust in technology" (Lankton, McKnight, & Thatcher, 2014; Wang & Benbasat, 2005). In exchanges with autonomous agents, which involve transferring the decision making role from humans to technological agents, trust in technology becomes ever more critical to adoption (Glancy, 2012; Tay, Jung, & Park, 2014). It is proposed that for consumers to use self-driving taxi, they need to trust that the cars will work as designed.

Hypothesis 2 Trust in technology has a positive effect on intention to use self-driving taxi.

Lankton, McKnight, and Thatcher (2014) conceptualize system-like technology trusting expectations, which include reliability (i.e., continuously operating properly and in a flawless manner), functionality (i.e., having the functions and features to accomplish tasks), and helpfulness (i.e., providing adequate and responsive aid). They argue that these attributes are appropriate for less human-like technology artefacts (Lankton, McKnight, & Thatcher, 2014) as opposed to, for example, social robots that are designed to have human-like characteristics. Thus, it is expected that these attributes can capture trust in self-driving cars.

3 Method

In order to test the hypotheses, an online questionnaire was developed to capture attitudes toward technology, trust in technology, and intention to use self-driving taxi. To compare general attitudes toward computers and robots, respondents were randomly assigned into two groups: one responded to the original 20 items in CAS scale (Nickell & Pinto, 1986) (computer group) and the other to modified items where the word "computer" was replaced by "robot" (robot group). Respondents were given a scenario of a ride-hailing service with self-driving cars and asked if they agree to associate self-driving cars with computers or with robots, respective of their group. Trust in technology was measured by Lankton, McKnight, and Thatcher's (2014) scale with nine items measuring three constructs: reliability,

functionality, and helpfulness, adapted to fit the self-driving taxi context. To measure a priori acceptance, respondents were asked to state the likelihood of using self-driving taxi in two different contexts: at home (as a resident) and while traveling (as a tourist). The questionnaire also includes demographic characteristics, travel behaviour, frequency of using taxi, use of ride-hailing services, and personal innovativeness, which is measured using domain specific innovativeness (DSI) scale (Goldsmith & Hofacker, 1991).

The questionnaire was distributed through Amazon Mechanical Turk, a marketplace for work that requires human intelligence, in July 2016. In order to obtain quality data from relevant respondents, the survey was only made available to users with approval rate above 98%. This effort resulted in 325 responses. Respondents are 60% male, mostly younger (58% under 35 years old), mostly college-educated (43% have at least a Bachelor Degree), and with household income less than US$ 40,000 (about 46%). Data were analysed using factor analysis, analysis of variance (ANOVA), and hierarchical regression analysis.

4 Findings

Negative Attitude toward Technology. Principal Component Analyses (PCA) were conducted separately for computer and robot groups, each revealed four dimensions, accounting for 63% of variance in computer group and 66% in robot group. Thus, PCA was conducted with aggregate data and the resulting four factors, accounting for 63% of variance, were used for subsequent analyses (see Table 1). *(Un)Beneficial* explains perception on the benefits of computers or robots to humans and society (all in reversed scale). *Dehumanizing* contains perceived harm and damages caused by the use of computers and robots on human beings and society (e.g., loss of jobs and human values). *Intimidating* reflects perceived complexity of computers/robots that is beyond people's comprehension. *Controlling* explains concerns over computers/robots gaining more power and, thus, control human's life.

As illustrated in Fig. 1, negative attitudes toward computers/robots are relatively low. Comparing the two groups using one-way ANOVA, there are significant differences between computers and robots in terms of (Un)Beneficial (F (1,324) = 27.100, p = 0.000) and Intimidating (F (1,324) = 31.397, p = 0.000) factors, with robots being viewed as more intimidating and less beneficial than computers. This suggests that language use can influence perception of technology among the general public. No differences were found across respondent characteristics.

Responding to the scenario about self-driving taxi service, respondents in the computer group demonstrated high level of agreement to associating self-driving taxis as (being driven by) computers (*Mean* = 4.64, *s.d.* = 0.64), while those in the robot group were slightly less (*Mean* = 3.76, *s.d.* = 1.14) in associating self-driving taxis with (being driven by) robots (ANOVA: F (1,324) = 76.766, p = 0.000).

Table 1 Attitude toward computers/robots

Attitude toward computers/robots (ACR)	Factor loading	Eigen-value	Cum. %	Alpha
Factor 1: (Un)Beneficial		3.52	17.60	0.84
Computers (robots) are responsible for many of the good things we enjoy[a]	0.72			
The use of computers (robots) is enhancing our standard of living[a]	0.71			
Computers (robots) are a fast and efficient means of gaining information[a]	0.71			
Computers (robots) can eliminate a lot of tedious work for people[a]	0.70			
Computers (robots) are bringing us to a bright new era[a]	0.66			
There are unlimited possibilities of computer (robotic) applications that haven't even been thought of yet[a]	0.66			
Life will be easier and faster with computers (robots)[a]	0.57			
Factor 2: Dehumanizing		3.43	34.73	0.84
Computers (robots) are dehumanizing the society	0.84			
The overuse of computers (robots) maybe harmful and damaging to humans	0.78			
Computers (robots) are lessening the importance of too many jobs now done by humans	0.77			
People are becoming slaves to computers (robots)	0.63			
Computers (robots) turn people into just another number	0.63			
Factor 3: Intimidating		3.08	50.11	0.89
Computers (robots) intimidate me because they seem so complex	0.86			
Computers (robots) make me uncomfortable because I don't understand them	0.79			
Computers (robots) are difficult to understand and frustrating to work with	0.77			
I feel intimidated by computers (robots)	0.74			
Factor 4: Controlling		2.51	62.68	0.77
Soon our world will be completely run by computers (robots)	0.79			
Computers (robots) will never replace human life[a]	0.78			
Soon our lives will be controlled by computers (robots)	0.75			
Computers (robots) will replace the need for working human beings	0.70			

Note[a]reversed scale; Alpha = Cronbach's alpha

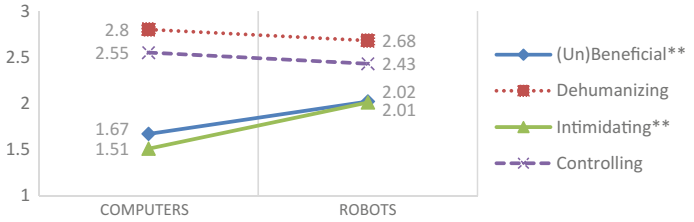

Fig. 1 Attitude toward computers versus robots (mean values). *Note* ** significant at $p < 0.01$

Trust in Technology. Consistent with Lankton, McKnight, and Thatcher (2014), three factors emerged from factor analysis for trust in self-driving taxi: reliability, functionality, and helpfulness (Table 2). As illustrated in Fig. 2, the mean values for trust factors indicate medium to high level of trust in self-driving taxi. Comparing mean values of trust factors between computer and robot groups showed a significant difference in Helpfulness (F (1,324) = 4.010, p = 0.046), with computer group scoring higher (see Fig. 2). Mean differences in trust were also tested across different user factors. A significant difference was found only in terms of gender, with male rating higher on Reliability (F (1,322) = 8.840, p = 0.003), Functionality (F (1,322) = 5.519, p = 0.019) and Helpfulness (F (1,322) = 11.507, p = 0.001). Therefore, gender was included as an explanatory variable in regression analyses.

Intention to Use Self-Driving Taxi. Respondents indicated a higher level of intention to use self-driving taxi as tourists (*Mean* = 3.38, *s.d.* = 1.23) than as

Table 2 Trust in self-driving taxi

Trust in self-driving taxi	Factor loading	Eigen-value	Cum. %	Alpha
Factor 1: Reliability		2.75	30.58	0.95
…will not malfunction on me	0.92			
…will provide error-free ride	0.91			
…will not fail on me	0.86			
Factor 2: Functionality		2.74	61.04	0.95
…will have the features required to get me to where I need to go	0.89			
…will have the overall capabilities to get me to where I need to go	0.88			
…will have the functionalities to get me to where I need to go	0.88			
Factor 3: Helpfulness		2.38	87.53	0.87
…will provide me the help I need during a ride	0.91			
…will supply my need for help during a ride	0.78			
…will provide competent guidance during a ride	0.76			

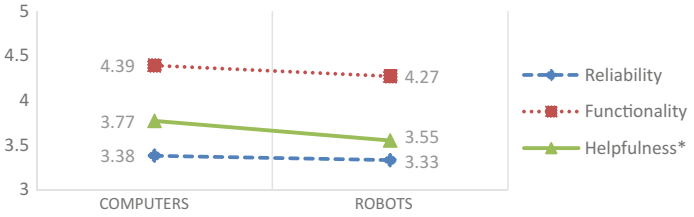

Fig. 2 Trust in Self-Driving Taxi: computers versus robots. *Note* * significant at $p < 0.05$

Table 3 Correlation matrix

Variables	Correlation						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) (Un)Beneficial	1						
(2) Dehumanizing	0.40^{**}	1					
(3) Intimidating	0.45^{**}	0.42^{**}	1				
(4) Controlling	0.13^{**}	0.50^{**}	0.29^{**}	1			
(5) Reliable	-0.36^{**}	-0.34^{**}	-0.20^{**}	-0.06^{ns}	1		
(6) Functional	-0.52^{**}	-0.22^{**}	-0.31^{**}	-0.06^{ns}	0.51^{**}	1	
(7) Helpful	-0.39^{**}	-0.28^{**}	-0.21^{**}	-0.02^{ns}	0.54^{**}	0.60^{**}	1
(8) Innovativeness	-0.26^{**}	-0.18^{**}	-0.19^{**}	0.09^{ns}	0.21^{**}	0.13^{*}	0.25^{**}

Note *significant at $p < 0.01$; ** significant at $p < 0.001$; ns = not significant

residents (*Mean* = 2.85, *s.d.* = 1.32), suggesting the potential impacts of this service for the tourism industry. Prior to conducting regression analyses, correlations between explanatory variables in the model were assessed (see Table 3). While factors of attitudes have significant correlations with factors of trust (except Controlling), the correlation coefficients are not too high to warrant concerns for multicollinearity in regression analyses.

Next, hierarchical regression analyses were conducted for the intention to use self-driving taxi at home and for travel. Model 1 assesses the effects of attitude and trust factors; then the control variables were integrated into Model 2 to assist in isolating the effects of independent variables. Dehumanizing and Reliability significantly affect intention to use self-driving taxi at home in Model 1 (Table 4). Integrating the control variables significantly improved the model (R^2 change = 0.212), with Reliability, Functionality, prior experience with ride-hailing services, and frequent use of taxi at home and for travel as significant predictors of intention. Intention to use self-driving taxi for travel is significantly explained by Dehumanizing, Reliability, Functionality, and Helpfulness in Model 1. The explanatory power in Model 2 improved only slightly (R^2 change = 0.091), indicating weak effects of the control variables. Dehumanizing, Reliability, Functionality, Helpfulness, frequent use

Table 4 Results of regression analyses

	Intention—at home		Intention—for travel	
	Model 1	Model 2	Model 1	Model 2
R^2	0.210	0.422	0.349	0.440
R^2 Change	0.210	0.212	0.349	0.091
F	12.008	16.098	24.192	17.364
F Change	12.008	16.157	24.192	7.208
Sig. of F Change	0.000	0.000	0.000	0.000
Independent Variables				
ACR: (Un)Beneficial	-0.055^{ns}	-0.063^{ns}	-0.014^{ns}	0.019^{ns}
ACR: Dehumanizing	-0.132^{*}	-0.099^{ns}	-0.248^{**}	-0.204^{**}
ACR: Intimidating	-0.043^{ns}	-0.082^{ns}	-0.063^{ns}	-0.054^{ns}
ACR: Controlling	0.078^{ns}	0.037^{ns}	0.093^{ns}	0.041^{ns}
Trust: Reliability	0.247^{***}	0.173^{**}	0.219^{***}	0.184^{***}
Trust: Functionality	0.087^{ns}	0.175^{**}	0.155^{**}	0.194^{**}
Trust: Helpfulness	0.080^{ns}	-0.012^{ns}	0.149^{**}	0.114^{*}
Control Variables				
Took Trip (Dummy)		0.025^{ns}		0.027^{ns}
Took Uber (Dummy)		0.134^{**}		0.023^{ns}
Taxi Use at Home		0.463^{***}		0.075^{ns}
Taxi Use for Travel		-0.173^{**}		0.181^{***}
Gender (Dummy)		-0.023^{ns}		-0.029^{ns}
Innovativeness		0.057^{ns}		0.130^{**}
Computer Group (Dummy)		0.013^{ns}		0.038^{ns}

Note * significant at $p < 0.05$; ** significant at $p < 0.01$; *** significant at $p < 0.001$; ns = not significant

of taxi for travel and personal innovativeness are significant predictors of intention to use self-driving taxi for travel.

Of the attitude factors, only Dehumanizing was found to negatively influence intention to use self-driving taxi at home and for travel (partial support for Hypothesis 1). This indicates that consumers' perception of technology taking away human values is still a hurdle for adoption of autonomous cars. Factors of trust positively influence intention to use self-driving taxi, except for Helpfulness in at home context (partial support for Hypothesis 2). In particular, Reliability consistently showed significance and higher beta values in predicting intention. It is important to note that travellers who use taxi more frequently in tourism destinations are more likely to use self-driving taxi for travel. Also, the positive effect of personal innovativeness on intention to use self-driving taxi for travel confirms the role of innovativeness in adoption of a novel technology (self-driving cars) in less familiar places (i.e., tourism destinations).

5 Conclusion and Recommendation

The introduction of self-driving cars for ride-hailing services marks the start of a new era of smart travel. This new development signifies research needs on consumers' response to the opportunity to use autonomous vehicles for personal travel (i.e., commuting and tourism). This study investigates consumers' a priori acceptance of self-driving taxi at home and while traveling and assesses the influences of attitudes toward and trust in technology. Respondents demonstrated low negative attitudes toward technology and high trust in self-driving taxi. The perception that technology can be dehumanizing was found to negatively influence use intention, while expectations of reliability, functionality, and helpfulness of self-driving taxi contribute to use intention. It can be suggested that in order to remove the roadblock to adoption of autonomous on demand mobility system, it is imperative for developers to communicate to the general public that the use of autonomous vehicles would not lessen people's roles (e.g., human drivers are no longer needed, reduced value of driving skills), but provide opportunities for new roles (e.g., new types of employment). Building trust in self-driving cars amongst consumers, especially with regards to their reliability, will also guarantee a higher adoption rate. While found insignificant to influence intention, language use in communicating new technology also plays a role in shaping consumers' perception. Referring to autonomous vehicles as robot cars, for example, may result in consumers perceiving them as more complex (thus, intimidating) and less helpful.

This study also found that use intention was caused by current patterns of mobility. Frequent taxi use and prior experience with Uber positively affect use intention at home, while personal innovativeness and frequent use of taxi for travel positively affect use intention while traveling. The higher level of intention to use self-driving taxi for travel (compared to at home) indicates a major impact of this development on tourism. For tourism destinations, it is expected that innovative tourists (those who are eager to try out new things) and heavy users of taxi services (i.e., personal transportation) to be more likely to adopt self-driving taxi. Therefore, portraying self-driving taxi service as a novel experience in marketing materials would appeal to these types of tourists and drive adoption. This study is among the first attempts to investigate autonomous on demand mobility system in tourism. As autonomous technology (including the subject areas of robotics and artificial intelligence) is an emerging topic in tourism research, future research should focus on ethics, privacy, values, and other issues beyond system-like expectations that are relevant to consumers' attitudes toward self-driving vehicles and likelihood for adoption in various tourism settings.

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Personality Impacts on the Participation in Peer-to-Peer (P2P) Travel Accommodation Services

Ilona Pezenka, Christian Weismayer and Lidija Lalicic

Abstract Peer-to-peer (P2P) services rapidly has become more and more important within the travel accommodation service industry over the last years. Thus it is crucial to know why certain groups of people do or do not participate in P2P accommodation services. Comparisons between the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) reveal insight into differences between Airbnb-users and Airbnb-nonusers with regards to their personality. Equality constraints on the measurement construct across the two groups guarantee for the comparability between them as well as reveal existing differences on the five latent dimensions. Comparableness is derived by a recently invented alignment procedure within the structural equation modelling (SEM) framework.

Keywords Big Five · Personality · Peer-to-peer (P2P) · Travel accommodation · Sharing economy

1 Introduction

Airbnb is a commission-based web-platform for room sharers and travellers. It was founded in 2008 in San Francisco and offers accommodation in more than 34,000 cities in 191 countries. In 2016 Airbnb boasts a total of 60 million guests and over 2 million worldwide listings (Airbnb, 2016). Recently, Airbnb introduced a new

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feature allowing companies to book Airbnb listings for their employees. Airbnb is projected to process almost 100 million bookings beyond 2016, with a 40–50% growth in accommodation offered per year (Huston, 2015). Meanwhile Airbnb has become a serious threat to the traditional hospitality industry.

Airbnb, along with other companies like Uber or Zipcar, is part of the so-called sharing economy. Recent developments in Internet technology have facilitated the exchange of nearly everything (cars, clothes, accommodation…) by using online market platforms. Despite the rising popularity of such online platforms, little is known regarding the people participating in the sharing economy. A few studies focusing on car sharing have been conducted (e.g., Zhou & Kockelman, 2011) but there is hardly any scholarly work exploring participants of the sharing economy in the tourism context.

Previous studies have shown, demographics are not significant predictors of travel or booking behaviour (Jani, Jang, & Hwang, 2011; Tussyadiah & Pesonen, 2015; Yoo & Gretzel, 2011). Since personality does not change over time and is supposed to be a constant driver of behaviour (Costa & McCrae, 1985), it is expected to be a better predictor of human behaviour than other personal factors. Thus, this study explores psychographics of Airbnb users and non-users in terms of the Big Five personality traits.

A new approach regarding equality constraints on the measurement construct across the two groups within a SEM model is applied. The ability to compare factor means and variances is based on the measurement invariance assumption. Fulfilment of the same is seldom the case and typically only reachable through tedious modifications. The multiple-group factor analysis alignment proposed by Asparouhov and Muthén (2013, 2014) will be used instead and makes multiple modification steps needless.

2 Literature Review

2.1 Airbnb as Part of the Sharing Economy

The exceptional growth of Airbnb recently aroused the interest of the scientific community in these kind of business models, often referred to as collaborative consumption or sharing economy. The terms “sharing economy,” “peer economy,” “collaborative economy,” and “collaborative consumption” are often being used synonymously. According to Botsman (2013) collaborative consumption, which can be defined as “an economic model based on sharing, swapping, trading, or renting products and services, enabling access over ownership”, serves as an umbrella concept that incorporates several forms of online platforms which endorse sharing the consumption of goods and services. Thus, collaborative consumption includes the business-to-business level, the sharing economy and the peer economy.

Botsman (2013) defines the sharing economy as "an economic model based on sharing underutilized assets from spaces to skills to stuff for monetary or non-monetary benefits". It appears in peer-to-peer as well as in business-to-consumer models. The term "sharing economy" cannot be equated with "sharing" in the proper sense of the word and is therefore somehow misleading. Belk's (2007, p. 126) definition of sharing is "the act and process of distributing what is ours to others for their use and/or the act and process of receiving or taking something from others for our use." Belk (2014, p. 1597) makes a clear distinction between sharing and collaborative consumption, which "is people coordinating the acquisition and distribution of a resource for a fee or other compensation." This definition also includes bartering, trading, and swapping as "other compensation" is not explicitly mentioned, but clearly excludes sharing activities (e.g., CouchSurfing) as there is no compensation involved. Thus, following Belk (2014), Airbnb cannot be classified as sharing due to the compensation the host gets from the guest. Also Oskam and Boswijk (2016) claim that companies as Uber and Airbnb have nothing to do with sharing. These platforms enable a digital expansion of the market economy by coordinating supply and demand of products and services.

Despite the growing importance of the sharing economy, little is known about the people participating in it (Guttentag, 2015). Guttentag (2015) states that Airbnb is not comparable to traditional hotels in terms of accommodation selection criteria offered. Typically, tourists choose their accommodation on the basis of features such as service quality, reputation, comfort & equipment, and security (Dolnicar & Otter, 2003; Zaman, Botti, & Thanh, 2016). In this sense, Airbnb does not offer such key attributes but instead provides other benefits, e.g., authentic experience. In the literature, the success of Airbnb is explained by three main factors or attributes: idealistic motives, the authenticity of the accommodation experience and the economic benefits (Oskam & Boswijk, 2016).

According to the literature reviewed, the financial motivation, on both sides (guests and hosts), seems to be predominant (Guttentag, 2015; Hamari, Sjöklint, & Ukkonen, 2015; Möhlmann, 2015; Tussyadiah, 2015). Tussyadiah (2015) identified economic benefits, social interaction (to connect with others), and sustainability to be the main motivational factors for consumers to use peer-to-peer accommodation platforms. The author did not explicitly ask about the authentic experience by staying with locals but detected this motive from responses to the open-ended question. However, Guttentag (2015) stated that experiential appeal is, at least for a particular segment of travellers, also an important reason to use Airbnb. Referring to a study by Week (2012), Guttentag (2015) suggests that consumers viewing themselves as "travellers" instead of "tourists" are more likely to look for authentic experiences.

Möhlmann (2015) found that satisfaction and the likelihood of using Airbnb and Car2go is mainly influenced by factors such as utility, trust, economic considerations, and familiarity. The importance of trust has also been confirmed by a study of Ert, Fleischer, and Magen (2016). The authors revealed that the hosts' trustworthiness (operationalized by the means of photos and reviews) affects the probability of being chosen as well as the price policy. Further, Olson (2013) claimed that trust,

in terms of distrust among strangers and privacy concerns, is a significant barrier to collaborative consumption.

As demographics are concerned, the literature review revealed a tendency that younger people are more likely to be involved in collaborative consumption. This is mainly due to their affinity to ICT. For example, Tussyadiah (2015) found that people participating in collaborative consumption can be characterized as highly educated frequent travellers, who are more open to new offerings in the travel domain. Therefore, the author suggests that the innovativeness trait might be an important factor. In their study on the impact of peer-to-peer accommodation use on travel patterns, Tussyadiah and Pesonen (2015) found that demographic characteristics of travellers are not significant predictors of changes in travel patterns. This result is consistent with other studies (e.g., Jackson, White, & White, 2001; Jani et al., 2011; Yoo & Gretzel, 2011) suggesting other variables, such as lifestyle and values, to be more meaningful in explaining travel patterns.

2.2 Personality as a Predictor of Travel Behaviour

Literature suggests that personality could be a potential predictor of travel behaviour (e.g., Jani et al., 2011). However, only a few authors have examined the impact of personality, in terms of a trait theory (Allport, 1937) in the tourism domain. Jackson and Inbakaran (2006) claimed that tourism psychology was one of the most neglected areas in tourism research as well as in psychology. Since the 1970s authors developed specific tourist typologies (e.g., Cohen, 1972; Pearce, 1982) but references to trait theories were lacking.

One of the few studies incorporating trait theory in the tourism domain was realized by Plog (1974) by developing a tourism-specific personality scale on the basis of traits. He found that destinations are appealing for specific types of people and, as a consequence, tourists' personality characteristics determine their travel patterns and preferences. The author positioned tourist types on a continuum between psychocentric (not venturesome, anxious) and allocentric (venturers). In a subsequent paper, Plog (2001) classified destinations according to these personality types. However, as Plog did not further pursue his research, his instrument has not been extensively validated by others. Nickerson and Ellis (1991), building on Plog's (1974) work, described tourists on two dimensions, namely activation—extroversion and Plog's (1974) allocentric—psychocentric dimension. The authors found a moderate positive correlation between allocentrism and activation and subsequently developed eight tourist types. Nickerson and Ellis (1991) concluded that tourists should be described on both dimensions, which would lead to four major tourist personality types. Based on these findings, Jackson et al. (2001) combined these two independent dimensions and thus, developed four independent constructs (the explorer, the adventurer, the guided and the groupie).

In a later study, Jackson and Inbakaran (2006) made an attempt to develop a tourist personality inventory. Their comprehensive literature review revealed 349

tourist typologies published in 76 papers. A qualitative analysis of these typologies resulted in a detailed description of Plog's (1974) bipolar tourist personality scale (allocentrism—psychocentrism). In the second part of the study, the authors developed a psychological assessment instrument. This instrument was then evaluated in terms of criterion validity and compared to the extroversion dimension proposed by Eysenck and Eysenck (1970) and the openness dimension of the Big Five factors (Costa & McCrae, 1992). The results indicated that extroversion and allocentrism are two independent personality constructs. In contrast, allocentrism is strongly correlated to the openness dimension and thus, indicates that these scales measure similar constructs. In conclusion, Jackson and Inbakaran (2006) recommended to use both scales for capturing tourist personality.

Recent tourism related studies implementing the Big Five personality traits are rare. For instance, Kvasova (2015) explored the relationships between the Big Five personality dimensions and eco-friendly tourist behaviour. The author found that agreeableness, conscientiousness, extraversion, and neuroticism are positively related to pro-environmental tourist behaviour. Frew and Shaw (1999) investigated the relationship between personality, gender, and tourism behaviour. They used Holland's RIASEC (1985) personality types and found significant relations between the tourists' personality types, their gender and their behaviour. Jani et al. (2011) demonstrated the utility of the Big Five personality traits in explaining online travel information search and tourists' on-line purchases. The results of their study indicate that the Big Five factors openness to experience and neuroticism are predictors of the type of travel information sought as well as the channels used. However, the authors found only six Big Five items (out of 44) to be suitable for predicting Internet purchases. Yoo and Gretzel (2011) also investigated the relationship of personality and online travel information, in terms of consumer-generated media. Findings indicate that the travellers' personality traits significantly influence perceived barriers towards content creation. In detail, neuroticism generally increases barriers while the other personality dimensions lower these barriers. Compared to other disciplines, studies employing the Big Five personality traits are very limited in the tourism domain. Even though, the Big Five factor model is presumed to be very robust as it is based on a long development process and on numerous empirical studies across disciplines (Barrick & Mount, 1991; Chamorro-Premuzic & Furnham, 2003; Correa, Hinsley, & De Zuniga, 2010).

3 Methodology

The original questionnaire of the Big Five model (NEO-FFI) (Costa & McCrae, 1992) contains 60 items. Following Little et al. (1999), who recommend a minimum of three manifest items per latent variable, a shorter version (BFI-S; Gerlitz & Schupp, 2005) was used to assess personality. This short measure of the Big Five model has been developed for the German Socio-Economic Panel (SOEP) survey and contains 15 items with the individual scales displaying strong coherence

(Gerlitz & Schupp, 2005). The BFI-S captures five factors, namely neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The trait structure is listed in Table 1. The items were measured on a 5-point Likert-scale, ranging from '1–disagree strongly' to '5–agree strongly'. An underscore between the construct's initial letter and the running number indicates a negatively poled item with regards to the naming of each of the five constructs.

First, exploratory factor analysis (EFA) revealed insight into the higher dimensional structure of the 15 items. Mplus (Muthén & Muthén, 1998) was used to incorporate the EFA into a structural equation modelling (SEM) framework, called EFA-SEM, or short ESEM. Starting with an EFA before conducting a confirmatory factor analysis (CFA) is the typical analytical sequence for validity testing of constructs. The Geomin rotation method, the default procedure in Mplus (Muthén & Muthén, 1998), is used to ease the interpretation of factor loadings. Compared with orthogonal solutions it allows for factor correlations. Monte Carlo studies highlight its advantages (Asparouhov & Muthén, 2009). Furthermore, instead of sticking to the .3 rule of thumb for the relation identification of indicators to their respective latent trait, significance values and standard errors are used instead, as recommended by Asparouhov and Muthén (2009).

As the EFA is typically followed by a confirmatory factor analysis (CFA), the second part focuses on the Big Five differences between Airbnb users and non-users following a pre-defined measurement structure. On the manifest indicator level Mann-Whitney U-tests are normally conducted individually with each single item if the indicators are measured on an ordinal scale. On the latent level factor scores have to be compared. which is just allowed across multiple groups if the measurement invariance assumption is fulfilled. An extensive literature overview on measurement invariance testing was compiled by Vandenberg and Lance (2000). Summarized, there are typically seven invariance assumptions stated (e.g., see Milfont and Fischer (2010) for a visual description). Depending on the target of the particular study, some or all of them have to be fulfilled. The following three assumptions are applied in this study:

(1) *Configural invariance* ensures that the factorial structure (number of factors, same pattern of fixed and free parameters), hence its basic understanding from the perspective of each subpopulation, does not differ between the groups.
(2) *Metric invariance* holds factor loadings equal across groups to make sure that the manifest indicators have the same meaning. This assumption must be fulfilled to be able to compare factor variances across groups.
(3) *Scalar invariance* inserts restrictions of equal item intercepts across groups. This assumption has to be fulfilled in order to compare factor means across groups. As the main aim here is to analyse differences of the Big Five traits between the two groups on a latent level this third invariance assumption must be met as well.

The primary focus here is based on the assumption that differences between factor means as well as variances exist between Airbnb users and non-users, thus, the

Table 1 Big-Five structure and EFA-SEM Geomin rotated factor loadings (z-statistics)

Latent trait	Indicator (I see myself as someone who…)	Extraversion	Neuroticism	Conscientiousness	Openness	Agreeableness
Extraversion (E)	…is communicative, talkative (E1)	0.868* (21.850)	0.032* (2.427)	0.146* (3.409)	0.016 (1.484)	0.016 (0.919)
	…is outgoing, sociable (E2)	0.634* (17.302)	−0.012 (−0.855)	0.013 (1.018)	0.060* (2.071)	0.260* (7.419)
	…is reserved (E_3)	−0.402* (−10.876)	0.230* (7.253)	0.134* (2.994)	0.275* (6.049)	0.011 (0.505)
Neuroticism (N)	…worries a lot (N1)	−0.046 (−1.903)	0.748* (37.206)	0.073* (2.323)	0.018 (0.932)	0.048 (1.676)
	…gets nervous easily (N2)	−0.035 (−1.547)	0.802* (42.379)	0.002 (0.157)	−0.038 (−1.471)	0.011 (0.608)
	…is relaxed, handles stress well (N_3)	−0.072* (−2.652)	−0.470* (−18.784)	0.107* (2.772)	0.327* (7.124)	0.129* (3.071)
Conscientiousness (C)	…does a thorough job (C1)	0.058* (1.992)	0.059* (2.421)	0.651* (17.854)	0.023 (0.957)	−0.011 (−0.443)
	…tends to be lazy (C_2)	0.009 (0.397)	0.258* (8.304)	−0.438* (−12.617)	0.279* (6.349)	0.010 (0.553)
	…does things effectively and efficiently (C3)	0.019 (0.877)	−0.012 (−0.938)	0.707* (16.757)	0.038 (1.433)	0.122* (2.940)
Openness (O)	…is original, comes up with new ideas (O1)	0.109* (3.057)	−0.067* (−2.884)	0.111* (3.146)	0.672* (16.811)	−0.066 (−1.810)
	…values artistic experiences (O2)	0.035 (1.135)	0.067* (2.807)	−0.018 (−0.697)	0.511* (12.731)	0.140* (2.945)
	…has an active imagination (O3)	0.015 (0.694)	−0.050* (−2.742)	−0.026 (−1.121)	0.715* (17.758)	0.121* (2.430)
Agreeableness (A)	…is sometimes somewhat rude to others (A_1)	0.019 (1.182)	0.211* (5.855)	−0.021 (−1.075)	0.404* (8.167)	−0.528*(−11.669)
	…has a forgiving nature (A2)	0.054 (1.596)	0.135* (4.838)	−0.013 (−0.448)	0.094* (2.414)	0.443* (12.016)
	…is considerate and kind to others (A3)	0.053 (1.607)	0.031* (2.118)	0.012 (0.514)	0.014 (1.391)	0.859* (19.955)

(χ^2-value: 480.954, df: 40, p-value < 0.001; RMSEA 0.088; CFI 0.948; TLI 0.863; *sign. at the 5% level)

remaining consecutive invariance assumptions are too strict and not applied: (4) *factor variance invariance*, (5) *factor covariance invariance*, and (6) *factor mean invariance*. Finally, (7) *error variance invariance* assumes the same size of measurement error for each manifest item across groups. Steinmetz, Schmidt, Tina-Booh, Wieczorek, and Schwartz (2009) argue that this assumption is less important in SEM as relationships between latent variables are already corrected. According to the literature, full invariance, even of the first three restrictions, is seldom fulfilled across different populations. Consequently, the partial invariance assumption was introduced. Vandenberg and Lance (2000) see the relaxation of the metric and scalar invariance restrictions rather critical but accept them for a minority of indicators.

Tests for metric and scalar invariance were typically conducted by means of likelihood ratio (LR) comparisons. The proposed hierarchy recommends a comparison of the configural (baseline) with the metric invariance model, followed by the metric against the scalar invariance model. Significant differences uncover invariance problems. Alterations based upon modification indices are used to derive non-significant LR tests. They reveal the most problematic equality restrictions across groups. Two approaches were listed by Muthén and Asparouhov (2014) on how to cope with non-invariance issues: (1) The bottom-up approach starts with the configural invariance model and imposes restrictions, (2) the top-down approach starts with the scalar invariance model and frees invariance restrictions. Relaxing restrictions in the face of partial invariance as long as non-significant differences are derived is cumbersome and "does not guarantee that the simplest, most interpretable model with the fewest noninvariant parameters is reached" (Asparouhov & Muthén, 2013, p. 5). Therefore, an optimization routine was invented. A scalar model is optimized whereby its simplicity function "will be minimized at a solution where there are a few large noninvariant measurement parameters and many approximately invariant measurement parameters…" (Asparouhov & Muthén, 2014, p. 3). This logic follows the permission to compare factor means and factor variances without requiring exact measurement invariance (Muthén & Asparouhov, 2014). The alignment procedure will be conducted.

4 Results

4.1 Descriptive Statistics

Data was collected in May 2016 by an online questionnaire. Potential respondents were addressed through social media platforms. The convenience sampling approach resulted in 600 Airbnb users who already booked an Airbnb accommodation (2.76 times on average) and 826 people who never used Airbnb before. In total 1,426 respondents completed the personality questions. 821 respondents were Europeans, 507 Asians, 98 respondents originated from the other continents. 90.1% of the respondents were travelling for leisure. Table 2 exhibits sample

Table 2 Sample descriptives

		Airbnb users	Airbnb nonusers
Gender	Male/female	35.0%/65%	44.1%/55.9%
Marital status	Single/married	60.7%/8.0%	67.2%/10.2%
	Partnership/divorced	30.7%/0.7%	22.3%/0.4%
With whom do you primarily travel?	Family/alone	30.5%/8.3%	41.3%/9.6%
	Friends/Partner	44.5%/ 16.7%	36.7%/12.5%
How often do you travel annually?		4.93	4.36
Typical price per night of the places that you book?		94.80 USD	119.27 USD

characteristics. Mann-Whitney U-tests revealed that Airbnb users travel more often ($p < 0.001$) and book a place with a lower price per night ($p = 0.001$). χ^2-statistics of crosstabs exhibit that women are significantly overrepresented ($p = 0.001$). People of the Airbnb user group primarily travel with friends and partner, those who travel with their family are underrepresented ($p < 0.001$). No significant differences were detected regarding education. In both groups >40% hold a high school diploma. Nearly 25% are employed, and >60% are students. The average age was ∼25 years with an average income of a little bit more than € 1,000.

4.2 Personality Dimensions and Differences

To test for the dimensionality, first an ESEM was conducted. Geomin rotation was applied and parameter estimates were derived by the weighted least squares means and variance adjusted (WLSMV) estimator. Factor loadings and z-statistics are given in Table 1. All indicators show factor loadings >0.4 on their a priori expected factor. All of them are significant and z-values are clearly higher row-wise compared to other significant factor loadings of the same indicator on one of the other four factors. This clearly supports the validity of the Big Five construct for the purpose at hand. [Note: Factor loadings of the orthogonal Varimax rotated EFA favours the underlying Big Five structure for all but one item, E_3 loads similarly high on E (−0.247) and N (0.268). All other 14 items have their highest loading on their inherent personality trait, being much higher compared with the ones of E_3.]

In the next step a multi-group confirmatory factor analysis (MGCFA) was conducted. To enable factor mean and variance comparisons, (partial) measurement invariance must be fulfilled. The former comparison procedure resulted in significant differences between the configural and metric, as well as the metric and scalar invariance model as listed in Table 3.

Instead of freeing across-group constraints step by step in the course of LR comparison tests between more and less restricted nested models and making use of modification indices, the multi-group factor analysis alignment procedure discussed

Table 3 Configural, metric and scalar invariance model comparisons

	Chi-square	df	p-value
Configural versus metric	21.430	10	0.0183
Metric versus scalar	50.205	20	0.0002

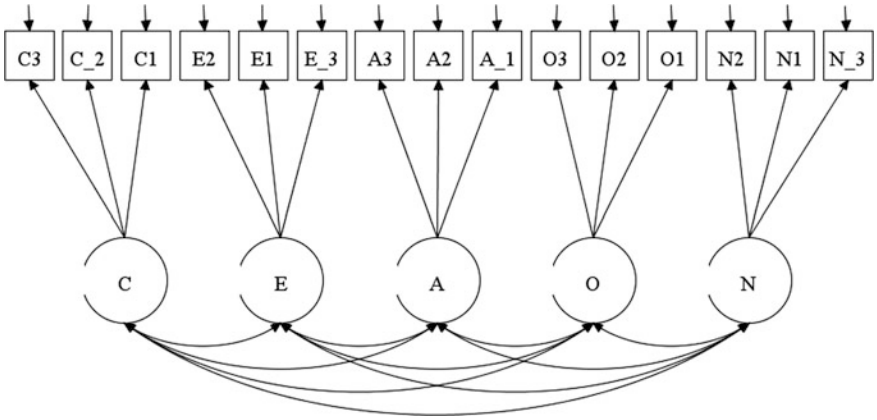

Fig. 1 CFA model

in the methodology chapter is applied. Indicators are treated as being interval scaled and the maximum likelihood (ML) estimator is employed. Figure 1 visualizes the CFA model. The multiple group alignment procedure stabilized at a stage of approximate measurement invariance for all item intercepts as well as factor loadings. Therefore, scalar invariance can be assumed and factor mean scores and factor score variances are allowed to be compared as they describe the same 'thing'.

Table 4 exhibits factor means and variances. Airbnb users score significantly higher on conscientiousness, extroversion, agreeableness and openness. No difference between the two groups was found regarding neuroticism. The higher evaluation of the four personality traits goes hand in hand with the within-group heterogeneities. Airbnb users are more homogeneous on the same except for neuroticism. This result fosters the similarity of respondents in terms of their higher ratings.

5 Discussion and Conclusion

There are striking differences between Airbnb users and Airbnb nonusers. Airbnb users tend to score significantly higher on openness, extraversion, agreeableness, and conscientiousness. The positive influence of openness on a person's tendency to use Airbnb can be interpreted based on the nature of the trait. As openness to experience represents one's predisposition to appreciate unusual ideas and to be

Table 4 Factor mean score/factor variances

Factor	Airbnb	C	E	A	O	N
Mean/variance	User	0.000/1.000	0.000/1.000	0.000/1.000	0.000/1.000	0.050/1.000
	Nonuser	−0.277/1.217	−0.277/1.086	−0.309/1.314	−0.241/1.250	0.000/0.948

imaginative (John & Srivastava, 1999) these results lead to the assumption that Airbnb users are generally more open to innovations and share a preference for novelty. These results are consistent with a previous study conducted by Correa et al. (2010). They found a positive relationship between openness to experiences and social media use and explained this finding with the novel nature of these technologies. Higher scores on the extraversion dimension of Airbnb users support the idea that authenticity of accommodation experience (Oskam & Boswijk, 2016) plays an important role in P2P accommodation services. According to the literature, a crucial motivator for using P2P accommodation is the possibility to get in touch with locals, and thus to enjoy a more authentic local experience off the beaten track (e.g., Guttentag, 2015; Oskam & Boswijk, 2016; Tussyadiah & Pesonen, 2015). As extraverted people can be characterised as being outgoing and enjoying human interaction this type of motivation obviously is of great significance. Agreeableness means that a person is generally good natured, co-operative and exhibits a high degree of trust (John & Srivastava, 1999). High scores of Airbnb users on this dimension confirm the important role of trust in P2P services, which is claimed to be a significant barrier to collaborative consumption (e.g., Ert et al., 2016; Olson, 2013). No difference was found between the two groups regarding neuroticism. However, regarding social media use in general, Correa et al. (2010) exhibited that people with greater levels of neuroticism were more likely to engage in these social activities. Also, Jani et al. (2011), exploring the link between personality and travel information search, found that individuals with higher scores on the neuroticism trait were more likely to search for information from the Internet. In summary, findings demonstrate the importance of personality traits in predicting the use of P2P accommodation services.

As psychographic segmentation is gaining significant attention within the tourism industry, the findings of this study reveal important implications for the accommodation sector. P2P travel becomes more and more popular, and will continue to expand its market share especially at the expense of low-budget hotels (Oskam & Boswijk, 2016). In the light of these future challenges, traditional hotels should adapt their services according to the psychographic characteristics of their potential customers, which are, according to the findings of this study, rather introverted and thus prefer solitary activities. Thus, hotels should offer individualised services (private guides, customised packages, etc.) to a greater extent. Furthermore, Airbnb non-users are generally more suspicious of strangers and of novel things. Therefore, hotels should emphasise the safety aspect of the accommodation. On the other hand, as authenticity seems to play an important role for Airbnb users (Guttentag, 2015), traditional tourist accommodation, especially larger hotel chains, should focus on food and events typical for that destination.

From a methodological perspective, the Big Five model has proven to be an adequate instrument for comparing Airbnb users and non-users in terms of their personality traits. A novel alignment procedure was used to overcome cumbersome model adaptation steps, which are inevitable when following traditional procedures. This new simplified approach still allows for comparison of factor variances and factor mean scores across groups. The study demonstrates that this method facilitates group comparison tests between Airbnb users and Airbnb nonusers. Future studies may include models where relationships between factors and covariates are analysed as well. E.g., multiple-group confirmatory factor analysis with covariates (MIMIC) might be used to study the effects of respondents' characteristics on the grouping variable and explain the reasons for differences on the latent constructs from an external perspective. Applied to psychological constructs, even deeper conclusions regarding population differences might be uncovered.

As far as limitations are concerned, it must be recognized that a convenience sample with an average age of around 25 in both groups was used. Thus, older people may be underrepresented, which could prevent the generalization of the findings. However, as personality traits tend to be stable throughout life, this factor should not affect the results to a great extent.

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The Role of Authenticity in Airbnb Experiences

Lidija Lalicic and Christian Weismayer

Abstract Integrating the concept of perceived authenticity into a peer-to-peer accommodation setting, this study investigates its impact on tourists' satisfaction and loyalty. Through an online survey among users of the popular peer-to-peer accommodation platform Airbnb, various factors which impact perceived authenticity were analysed using Structural Equation Modelling (SEM). Hospitality factors and service quality show to significantly impact tourists' perceived level of authenticity. Self-congruence does not show to impact a peer-to-peer accommodation authentic experience. In addition, this study demonstrates the role of perceived authenticity as an important part of the peer-to-peer hosting experience leading to satisfaction. Furthermore, hosts are provided insights how to enhance tourists' perceived authenticity and relive upon Airbnb's authentic brand claim.

Keywords Peer-to-peer accommodation · Authenticity · Satisfaction · SEM

1 Introduction

Postmodern consumption patterns are drastically changing and impacting market operations. This is caused primarily by two factors. First, postmodern society is characterized by fragmentation, confusion, division and a crisis of morality and identity, leading consumers to be concerned with identity, meaning and values (Goulding, 2000). As a result, postmodern consumers strive to overcome inauthenticity and seek for authentic experiences (Lewis & Brigder, 2000). Second, the

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recent economic recession triggered consumers to rethink their values and expenses, resulting in collaborative consumption practices. Hamari, Sjöklint, and Ukkonen (2015, p. 2) explains this as a "*peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services.*" Information and Communication Technologies (ICT) furthermore significantly enhances the development of mobile computing platforms, where consumers can easily share and exchange resources for free or any kind of compensation. These trends are apparent in the field of tourism as well. The increasing interest in peer-to-peer accommodation reflects this. The outstanding example, Airbnb, leader among peer-to-peer accommodation platforms, generates a revenue of more than 25 billion US$ yearly with over 6 million users (Kokalitcheva, 2015). The platform positions itself as a community where locals can easily open up their properties, host tourists in their homes and provide authentic experiences. The popularity of peer-to-peer accommodations has its impact on tourists' behaviour, destination management and revenues (e.g., Guttentag, 2015; Tussyadiah, 2015). For example, budget hotels are now directly competing with peer-to-peer properties, and higher-class hotels have to adapt their pricing strategies (Zervas, Proserpio, & Byers, 2014). In fact, destinations have started to recognize the positive effects of peer-to-peer accommodations, reflected in (i) increasing popularity of unknown neighbourhoods, (ii) active involvement of local host communities, and (iii) increase in tourists'expenses. Tussyadiah and Pesonen (2015) demonstrate a change in tourists' behaviour given that tourists when staying with a host tend to stay longer, spend more money and travel more frequently.

Research has started to investigate tourists' characteristics participating in peer-to-peer platforms. However, more insights are needed to better understand the market, behavioural patterns of postmodern tourists and design new marketing strategies (Oskam & Boswijk, 2016). In particular, the role of authenticity, as highlighted by Airbnb and perceived as an important part of the experience, needs to be investigated. Authenticity has predominantly been applied to heritage cultural sites and objects. However, the increasing need for tourists to experience epistemic values, for example, through the use of peer-to-peer accommodations, becomes an interesting field of research. As Kolar and Zabkar (2010) state, authenticity as an evaluative judgement, can complement other evaluative consumer-based concepts such as satisfaction. Additionally, it can enrich the understanding of the tourist experience and behaviours and serve for marketing management purposes. Yet, there is a lack of empirical examination of the relatedness of satisfaction with authenticity. Tussyadiah (2016) claims that hosts also need to have a better understanding of what leads to providing an authentic impression. This study aims to explore the role of authenticity in peer-to-peer accommodation. Furthermore, the study aims to investigate various factors impacting the perceived level of authenticity and its effect on tourist' satisfaction. In doing so, the paper provides a better understanding why tourists choose peer-to-peer accommodation over any other type of accommodation, and how tourists acknowledge authenticity in this setting. Practitioners must start recognizing the actual context that affects perceptions of

authenticity, and subsequently design an environment that triggers those feelings. Overall, tourism managers should devote more attention to subtle and deeply ingrained societal changes that exist outside the tourism market, yet those shape tourist behaviour and experiences (Kolar & Zabkar, 2010).

2 Literature Review

2.1 Peer-to-Peer Accommodation

Collaborative consumption derives from various motivations. Users perceive sharing to be time and money saving, not accompanied by ownership duties and providing autonomy. Botsman and Rogers (2010) highlight the economic recession as an influencing factor on consumers' spending behaviour and engagement with collaborative consumption. Hamari et al. (2015) refer to the social appeal to engage in collaborative consumption, which is driven by a desire for community and social interaction. Consumers have the opportunity to make new friends and to develop meaningful connections (Botsman & Rogers, 2010). The mobile computing platforms allow consumers to connect and be a part of a community, enhancing their reputation and recognition (Botsman & Rogers, 2010; Ert, Fleischer, & Magen, 2015; McArthur, 2015). Lastly, Su and Wall (2010) refer to enjoyment as a significant driver of consumers using shared resources. In this context enjoyment can be twofold (a) enjoyment of being a part of the community, and (b) enjoyment of epistemic experiences offered by the sharing community.

The most prominent form of collaborative consumption in tourism is peer-to-peer accommodations, where locals open up their properties to tourists. According to Tussydiah and Pesonen (2015) tourists engage in peer-to-peer accommodation consumption for several reasons. First, tourists book peer-to-peer accommodation because of the social interaction with the host and exploring the destination off-path. Second, economic and sustainable consumption reasons are considered as important drivers (Guttentag, 2015; Tussyadiah, 2015). For example, tourists perceive their engagement in peer-to-peer accommodation to support local community. However, also in a tourism context, the desire to be a part of the community and social interaction drives many tourists to choose peer-to-peer accommodations over other types of accommodation (Ert et al., 2015; Guttentag, 2015; McArthur, 2015; Tussyadiah, 2015). Tourists using peer-to-peer accommodation tend to be novelty seekers (Tussyadiah, 2015). Sweeney and Soutar (2001) argue that consumers who aim to satisfy their curiosity and novelty seeking behaviour tend to fulfil their desire by seeking for new experiences. In particular, the value of authenticity drives tourists to travel to different places in new ways (Cohen, 1988). However, research remains scarce on understanding which factors contribute to an authentic experience in peer-to-peer hosting context. The next section will explain the concept of authenticity in more detail.

2.2 Authenticity

Authenticity stems from the Greek word 'authentes', implying originator or creator. Golomb (1995) state that something that is authentic is genuine, real or true. Therefore, 'authentic' reflects something original rather than a copy or reproduction. In this sense authenticity refers to extrinsic qualities of an object or experience, whereas original refers to intrinsic features (Krösbacher & Mazanec, 2010). Authenticity was described as an externally recognized status, leaving a feeling of uniqueness. Thus, authenticity can take forms like cultural identity, status identity, experiences, technological mediation, self-construction and appearance (Cohen, 1988; Golomb, 1995).

There are two school of thoughts about authenticity: (i) object-based and (ii) existential-based. Both types can be perceived as evaluative judgments. Reisinger and Steiner (2006) conceive objective authenticity as how people see themselves in relation to objects. Krösbacher and Mazanec (2010), for example, state that the special purpose of a museum lies in retaining remembrance, and the strength lies in 'authenticity' of its objects. In contrast to the application of authenticity with respect to objects and settings, existentialist researchers discuss authenticity about human beings. According to Steiner and Reisinger (2006, p. 99) existential authenticity is signified 'being one's true self or being true to one's essential nature'. Wang (1999) state that if tourists engage in tourist activities, they can feel more authentic and more freely self-expressed than in everyday-life. Steiner and Reisinger (2006) define existential authenticity as a choice tourists make, thus, conceiving it as a behavioural construct. In that sense, authenticity can then be defined as tourists' enjoyment and perceptions of how genuine their experiences are. Here, the existential component relates to the perceptions, feelings and emotions of the site visitors, such as the uniqueness of the experience and a feeling of connectedness. The notion of getting closer to history is one important way to experience the authenticity of heritage sites (Chhabra, Healy, & Sills, 2003; Goulding, 2000).

Wang (1999) introduced a framework of different forms of existential authenticity distinguishing between intra- and interpersonal authenticity. Intra-personal refers to bodily feelings and self-making, whereas inter-personal authenticity refers to social authenticity and the collective sense of self. The latter, a setting or experience can serve as a 'tool to bring individuals together for authentic interpersonal relationships' (Leigh et al., 2006). Goulding (2000) refers to three different types of visitors, (i) "*existential' visitors,* who emphasize the importance of enjoyment and escape, mainly perceiving authenticity through exhibited artifacts (ii) *aesthetical visitors*, who perceive history mainly through art, and (iii) *social visitors,* who emphasize the importance of learning and social experiences. Given the setting of this study, tourists engage in peer-to-peer accommodation, are welcomed in local homes and have the chance to come closer to local culture. Based on previous literature, this concept is close to the existential and social visitors of Goulding's (2000) classification and Wangs' (1999) inter-personal authenticity

experience. In tourism, authenticity is predominantly perceived as a universal value and an essential driving force that motivates tourists to travel to new places (Cohen, 1988). Thus, the concept of authenticity can be of use in order to understand tourists' satisfaction processes in this study setting. In particular, this study is interested in the existential authenticity about guests' perceptions on whether to stay or not to stay at an Airbnb accommodation feels like 'living the local life'.

3 Theory Building

Host-guest interactions are considered an important part of the collaborative consumption setting. According to Tussyadiah (2016) hosts have to be aware of what leads to providing an authentic impression. In fact, local communities are major stakeholders in tourism; they foster tourism development and delivery as they act as service providers, sellers, craft people and ethnic attractions. Moreover, locals often possess rich knowledge of local environment, social and cultural traditions and deal daily with local issues. Locals, thus, have an impact on tourists' on-site behaviours, experiences, satisfaction (Pizam, Uriely, & Reichel, 2000). Chatting and activities with locals are considered the usual process enhancing tourists 'attachment with the destination (Pizam et al., 2000). In addition, hosts hosting guests in their homes should know that it is a requirement to be hospitable, through feelings of generosity, a desire to please and a genuine regard for the guest as an individual (Lashley, Morrison & Randall, 2004). Ariffin, Nameghi, and Zakaria (2013) show how personalization, e.g., knowing the guest's name, is vital for tourists' satisfaction. Therefore, factors determining hosts hosting behaviour contributes to the creation of exceptionally high level of guest relationships as well as valuable long-term relationships (Ariffin et al., 2013). Lashley et al. (2004) refer to the positive emotional tourists' value that stems out of an enhanced hospitality atmosphere created by the host, leading to higher level of perceived authentic experiences, thus living the local life because of peer-to-peer accommodation setting. Therefore, it is expected that:

H1 Hospitality factors have a direct positive effect on perceived authenticity.

The experience of renting a peer-to-peer accommodation offers tourists a closer contact to the local life and the destination. Tussyadiah (2015) refers to tourists' choosing peer-to-peer accommodation as novelty seekers, since they want a different hosting environment. However, these tourists are not used to less conventional types of accommodation; thus, they might be accustomed to different standards of quality and expect a similar standard of quality (Tussyadiah & Zach, 2015). In service literature, the concept of service quality is dominantly conceptualized by five determinants: reliability, responses, assurance, empathy and tangibles (Shankar, Smith, & Rangaswamy, 2003; Zeithaml, Berry, & Parasuraman, 1996). These dimensions contribute to tourists' intentions and overall satisfaction levels. Dolinar and Otter (2003) demonstrate how factors such as price, staff behaviour, hygiene and location positively influence consumers' attitudes (Dolnicar

& Otter, 2003). Tussyadiah and Zach (2015) state that the expected standard service quality makes peer-to-peer accommodation still comparable with hotels, as there is a lacking reference from the tourists' side. Hence, tourists' perceptions of an authentic stay is likely to be influenced by the perceptions of the offered service quality. Therefore, it is suggested that:

H2 Service quality has a direct positive effect on perceived authenticity.

In branding literature, consumers' identification with a brand shows to influence important positive behavioural outcomes. Consumers identify and associate themselves with the brand and hereby have a chance to reinforce their self-identities (Jamal & Goode, 2001). In tourism, the concept of self-congruency is often used to explain tourists' choices for a destination. As Sirgy and Su (2000) demonstrate, the greater the match between a tourist destination image and the tourist self-concept, the more likely the tourist has a favourable attitude towards the destination. In fact, identity seeking shows to be particularly important for experiencing authenticity. Yu and Littrell (2003) refer to personal involvement as an influence on the perception of authenticity. Morgan, Pritchard and Piggott (2002) state that the postmodern tourist revolves around the questions "who can I be on holiday?" Therefore, Steiner and Reisinger (2006) advise to link the relationship of authenticity with consumers' self-identity and/or meaning making to understand this process better. As seen in studies analysing object-authenticity, people review how they see themselves in relation to objects, subsequently leading to higher levels of perceived authenticity. Therefore, it is suggested that:

H3 Self congruence has a direct positive effect on perceived authenticity.

Authenticity is also conceived as a mediating, evaluative construct to consumer satisfaction (Jensen & Lindberg, 2001). Grayson and Martinec (2004) refer to authenticity as an input of tourist behaviour that subsequently leads to satisfaction. Consumers who experience authentic interaction seem to have higher levels of satisfaction (Krösbacher & Mazanec, 2010). Therefore, it is suggested that:

H4 Perceived authenticity has a direct positive effect on satisfaction.

Satisfaction is found to encompass cognitive and affective components, yet it is considered the key driver of consumer loyalty (Olivier, 1999). Research suggests that in evaluating the product or service offerings under the umbrella of a brand, consumers develop attitudes or satisfaction judgements about the purchase that justify their loyal relationships with the brand (Nam, Ekinci, & Whyatt, 2011; So, King, Sparks, & Wang, 2016). Therefore, the main function of a brand community is to make customers loyal to the brand (Laroche, Habibi, Richard, & Sankaranarayanan, 2012; Muniz & O'Guinn, 2001; Schau, Muñiz, & Arnould, 2009). According to Muniz and O'Guinn (2001) brand communities provide a social structure to customer-marketer relationships, which then significantly influence customer loyalty. Laroche et al. (2012) demonstrate how brand communities established on social media contribute to create value for the members as well as for

the company. In particular, online brand community affects loyalty through brand use practices (Laroche et al., 2012). Therefore, it is suggested that:

H5 Satisfaction has a direct positive effect on loyalty.

4 Research Design

4.1 Measures

All constructs were measured in the context of the popular peer-to-peer accommodation platform, Airbnb. First, respondents were asked to answer items based on their experience with the Airbnb community. See Table 1 for a detailed overview of the items per construct. Regarding the dimensions service quality, hospitality factors, perceived authenticity the respondents were asked to rate on a 5-point Likert scale the importance of various items (1 = extremely unimportant, 2 = unimportant, 3 = neutral, 4 = important, 5 = extremely important). The hospitality factors were based on a scale by Ariffin et al. (2013) capturing the importance of the hosts having hospitality skills while hosting the guests. The service quality construct was measured based on study of So et al. (2016) and adapted to the study setting. Self-congruence was based on a scale by Jamal and Goode (2001). Perceived authenticity items were developed based on a focus group with twenty-five participants discussing authenticity in peer-to-peer setting, where the main idea was capturing a preferably broad part of the authenticity dimension. Satisfaction was measured on a single variable asking respondents to rate their overall experience of their Airbnb stays from 1 = extremely dissatisfied, 2 = dissatisfied, 3 = satisfied, to 4 = extremely satisfied. Loyalty was measured based on scales of Cronin, Brady, and Hult (2000) and So et al. (2016) containing three items measured on an agreement scale from 1 = disagree strongly, 2 = disagree a little, 3 = neither agree nor disagree, 4 = agree a little, to 5 = agree strongly. The last item of the loyalty dimension (L3) is reversed, as this item is a negatively worded, and hereby can distort values such as Cronbach's Alpha.

4.2 Data Collection and Analysis

The data was collected by use of an online survey that was distributed by means of social media platforms in May 2016. All 557 respondents classified themselves as Airbnb users by the question: "Have you used Airbnb?" (yes, no) with an average booking frequency of 2.7 times. The structural model (see Fig. 1) was estimated in a Structural Equation Modeling (SEM) software M*plus* (Muthén & Muthén, 1998). Then, the underlying measurement models are brought to a latent level by means of

Table 1 Measurement constructs

Construct	Items	Means	Factor loadings	Composite reliability	Cronbach alpha
Hospitality factors (HF)	Warm welcome (HF1)	3.90	0.647	0.72	0.67
	The host understands my special requirements (HF2)	3.93	0.660		
	The host should not try to impress but rather take care (HF3)	3.79	0.660		
Service quality (SQ)	Host's responsiveness (SQ1)	4.20	0.775	0.85	0.77
	Host's assurance (SQ2)	4.01	0.806		
	Host's empathy (SQ3)	3.76	0.673		
	Host's reliability (SQ4)	4.43	0.771		
Self-congruence (SC)	Booking with Airbnb reflects who I am (SC1)	2.90	0.791	0.87	0.93
	The image of Airbnb is how I see myself (SC2)	2.75	0.929		
	Using Airbnb is consistent with how I think others would see me (SC3)	2.71	0.800		
Perceived authenticity (A)	Understand local culture (A1)	3.97	0.840	0.87	0.83
	Experience local life (A2)	4.09	0.903		
	Authentic experience (A3)	4.07	0.693		
Satisfaction (SAT)	Please rate your overall experiences of your Airbnb stays (SAT)	3.18		–	–
Loyalty (L)	I would recommend Airbnb again (L1)	4.31	0.895	0.87	0.69
	I will use Airbnb again (L2)	4.30	0.969		
	I will switch from Airbnb to another service provider (L3)	3.42	0.928		

Confirmatory Factor Analysis (CFA), except one, namely satisfaction which consisted of just one item. Later on, the dimensions were connected on a latent level within the SEM framework.

4.3 Sample

34% of the respondents were male and 66% were female. The average age was 24 years, ranging between a minimum of 16 and maximum of 62 years. The majority of the respondents were single (58%), whereas 29.5% were in a

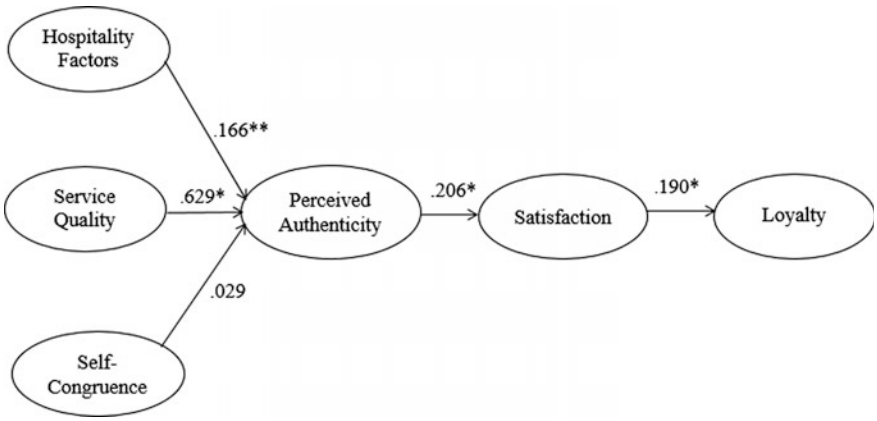

Fig. 1 Structural model. *Note* χ2-value: 510.103, df: 112; p-value < 0.001; RMSEA 0.08; CFI 0.977; TLI 0.972, * = p<0.001, ** = p<0.05

relationship, 8% were married and 4.5% were divorced. Regarding the highest level of education completed, 38.5% completed a high school, 16.3% a college/vocational degree, 32% a bachelor degree, 7% a master degree, 1.5% a Ph. D degree, 1% had below high school, and 1.3% marked other education. 65% of the respondents classified as students, 23% employed, 10% self-employed, and 2% unemployed. The average income was €1,021.67 per month. Respondents annually travel 5 times on average, with an average accommodation price per night of € 95.17. The majority (42%) of the respondents primarily travel with friends, 29% with their family, 16.5% with their partner and 12.5% alone.

5 Results

5.1 Measurement Model

Before testing the hypothesized relationships, various measures of the constructs were calculated to assess internal consistency, reliability, convergent validity and discriminant validity of the measurement constructs. All of the constructs have values close or above the preferred threshold level of 0.7 measuring Cronbach's Alpha and CR (composite reliability)-criteria of the recommended threshold of 0.5 (Hair, 2010); which is the suggested benchmark for acceptable reliability. Additionally, the AVE's (average variance extracted) of all constructs are also close or above the cut-off point of 0.50 which is an indication of convergent validity (Hu & Bentler, 1999). These results indicate that the measurement model displays both internal consistency, reliability and item convergent validity. Table 2 lists discriminant validity statistics in the lower triangle matrix. AVE of each construct

Table 2 Shared variance and average variance extracted

	HF	SQ	SC	A	L
Hospitality factors (HF)	0.43				
Service quality (SQ)	0.54	0.58			
Self-congruence (SC)	0.22	0.21	0.70		
Perceived authenticity (A)	0.43	0.57	0.15	0.68	
Loyalty (L)	<0.01	<0.01	<0.01	<0.01	0.87

should exceed the shared variance between the constructs (Hu & Bentler, 1999). Since the used items were collected from different sources to account for as much variance of the dependent variable as possible, however they were not tested and optimized in one single model before, it is likely that overlaps occur. However, just two constructs shared more variance with other constructs (SV) compared to the variance explained by its own indicators (AVE): hospitality factors with service quality (AVE:0.43 vs. SV:0.54). This means that discrimination validity is given except for those two constructs. Furthermore, Table 1 demonstrates the means of the observed items. Interestingly, respondents' valued perceived authenticity as an important part of their experiences. Furthermore, the items captured by the loyalty construct indicated that the majority of the respondents strongly agree with the statements. The item L3 shows relatively lower importance evaluations. However, given its reverse position this indicates that respondents are not strongly agreeing to switch to another service provider. Lastly, self-congruence is not perceived as important for the respondents.

5.2 Structural Model

The path coefficients are estimated by the use of the weighted least squares mean variance adjusted estimator (WLSMV). This estimator accounts for the ordinal scaling used. The model evaluation is guided by several fit indices: Comparative Fix Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) (Hu & Bentler, 1999). In this case these values are RMSEA = 0.08, CFI = 0.977, TLI = 0.972. The values are positively responding to the recommended acceptable fit thresholds (CFI =>0.90, TLI =>0.90, RMEA up to 0.08) (Hu & Bentler, 1999).

As can be seen in Fig. 1, hospitality factors have a positive effect on perceived authenticity ($\beta = 0.166$, $p < 0.05$), thus Hypothesis 1 is accepted. Service quality has also a positive direct effect on perceived authenticity ($\beta = 0.629$, $p < 0.001$), thus hypothesis 2 is accepted. Self-congruence does not have a significant impact on perceived authenticity ($\beta = 0.029$, $p = 0.520$). Thus, hypothesis 3 cannot be accepted. Perceived authenticity has a direct positive effect on satisfaction

($\beta = 0.206$, $p < 0.001$), confirming hypothesis 4. Lastly, satisfaction has a direct positive effect on loyalty ($\beta = 0.190$, $p < 0.001$), thus hypothesis 5 is accepted. Perceived authenticity has an explained variance of 60%.

6 Conclusion and Recommendations

As we have a major shift in travellers choosing peer-to-peer accommodations, a better understanding is needed of this postmodern consumption behaviour. In particular, the concept of authenticity is sought for in postmodern consumption situations. Emergent business models based upon collaborative consumption create new opportunities to overcome inauthenticity among consumers (Lewis & Bridger, 2000). Airbnb brands itself as a platform providing authentic peer-to-peer accommodations. Living the local life and coming closer to culture are important motivations to choose a peer-to-peer accommodation over any other type of accommodation (Tussyadiah & Pesonen, 2015). However, conceptualizing and understanding what leads to authentic experiences is rather unexplored. Thus, this study aimed to explore the conceptualization of authenticity as way to understand tourists' engagement with Airbnb. Through the conceptualising, the service triangle that characterizes the peer-to-peer setting (the host, the Airbnb platform and the guest itself) the process of building authentic experiences was investigated. In fact, the study's basic assumption that hosts can positively influence tourists' existential experiences via their hosting skills and providing an adequate service quality is justified. However, the feeling of authentic experiences shows not be built upon consumers' engagement with the Airbnb platform. Contrasting previous research that shows how identity seeking motivates collaborative consumption and lead to authentic experiences (Yu & Littrell, 2003). Thus, the study hereby visualizes that host factors are more significant than brand factors in understanding authenticity. Lastly, perceived authenticity served as a performance indicator for better understanding tourists' satisfaction and loyalty of peer-to-peer accommodations. Perceived authenticity in this case shows to contribute to tourists' satisfaction and subsequently loyalty. In this case, as Kolar and Zabkar (2010) state, the study was able to show how the concept of perceived authenticity can complement the concept of satisfaction and loyalty. This study hereby contributes to the question how hosts can enhance the perception of perceived authenticity. As perceived authenticity in this context was perceived as a way to understand and experience local life/culture, guests value hosts' assurance and responsiveness as well as providing a warm welcome as the most effective to experience Airbnb's authentic feelings. Thus, in terms of managerial implications, this study shows that the platform Airbnb can claim authentic experiences due to hosts' performances, leading to higher levels of tourists' satisfaction. However, marketers of such business models need to prevent developing into the hosting of peer-to-peer accommodations for commercial purposes, as this can lose its feeling of being authentic. This also implies that despite the major demand of peer-to-peer accommodations, hosts have to focus on

facilitating a stay creating genuine feelings. Hereby hosts can act upon Airbnb's authentic brand claim.

This study aimed to understanding the concept of authenticity in the context of collaborative consumption in tourism, but there is much more to explore. Future research needs to continue focusing on how and to what extent tourists are impacted by host-guest interactions in a peer-to-peer setting. This could subsequently provide more information for destination managers to understand tourists' expectations, in particular to perceived authenticity in postmodern consumption situations. Future studies should include various other factors to enhance the understanding of this topic. One could integrate all the items of the SERVQUAL model, to further enhance this concept in a peer-to-peer setting. As this study represent younger tourists (average 24 years old), repetition with a larger sample is needed. Lastly, authenticity is socially and individually constructed, more qualitative methods are called for. Overall, the development of theories capturing the concept of perceived authenticity in postmodern consumption behaviours in the field of tourism is called for.

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The original version of the book was inadvertently published without the following corrections:

In Chapter "The Future of Wearable Devices On-Site: A Scenario Technique Approach", author name order should be changed from "Rincon, Fernanda Ortiz" to "Ortiz Rincon, Fernanda".

In Chapter '"Thank You for Your Stay," and Then What? Macau Hotels' Responses to Consumer Online Reviews', author name order should be changed from "Chen Ning (Chris)" to "Ning (Chris) Chen".

In Chapter "Do Local Residents and Visitors Express the Same Sentiments on Destinations Through Social Media?", Fig. 1 needs to be changed.

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