Zheng Xiang · Iis Tussyadiah *Editors*

Information and Communication Technologies in Tourism 2014

Proceedings of the International Conference in Dublin, Ireland, January 21–24, 2014

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Preface

Organized by the International Federation for IT and Travel & Tourism (IFITT), ENTER2014 eTourism Conference was held in Dublin, Ireland on January 21-24, 2014. The international conference featured the latest research and industry case studies on the application of information and communication technologies (ICT) to travel and tourism under the theme "Where Social Inspiration Meets Dynamic eTourism Innovation."

The research track of ENTER2014 received a total of 141 submissions, 106 of which were full research papers 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 at least three members of ENTER2014 Scientific Committee assigned as reviewers. Where issues remained, additional reviews were commissioned. As a result, 65 full research papers were accepted for presentation at the conference and are included in this proceedings.

While still maintaining a broad topic of ICT application in travel and tourism, the conference covered local specializations and interests, as reflected in this proceedings. This proceedings comprises eight topics ranging from the development and strategic use of mobile and context-aware systems, social media and big data analytics, e-learning and organizations' adoption of ICT, and many more. This shows not only how significant the advancement in ICT is to tourism management and innovation, but also how relevant and impactful scientific research in tourism can be for further development in ICT. The papers featured in this 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 this 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 ENTER2014 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 best paper award. We are also thankful to ENTER2014 Chair, Wolfram Höpken, IFITT President, Dimitrios

Buhalis, other ENTER2014 organizers and members of IFITT for their support and for accommodating the many inquiries we have made while managing the research track. Lastly, we thank all who have expressed interest in the conference and contributed to it.

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Part I
Mobile Technologies and Context-Aware Systems

Mobile Social Travel Recommender System

Ander Garcia, Isabel Torre and Maria Teresa Linaza

Abstract Travel Recommender Systems (TRSs) help tourists discovering and selecting the Points of Interest (POIs) that best fit their preferences. Recommendations rely on the data available about the POIs of a destination, the knowledge about tourists and their preferences about categories, and recommendation algorithms. This paper presents a Mobile Social TRS. The recommendation process is divided in two independent processes: the generation of user models and the calculation of the recommended POIs. The recommender generates user models taking into account their explicit preferences about categories, demographic information, and the tags they have created. Then, similarities between users are based on the POIs they have rated. Finally, a hybrid filtering algorithm combines these models with a content-based and a collaborative filtering algorithm to calculate a list of recommended POIs. The recommender has been integrated in a mobile prototype of the CRUMBS social network and preliminary results of its partial validation are presented.

Keywords Travel recommender system · User model · Hybrid recommendation algorithm · Mobile

1 Introduction

The overwhelming amount of information about a destination and its Points of Interest (POIs) that is available makes the selection of the attractions or POIs to visit a difficult problem for tourists. Travel Recommender Systems (TRSs) assist tourists in this process, applying recommendation algorithms to estimate the POIs

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that best suit the preferences and needs of tourists. A TRS requires both detailed information about the POIs of the destination and tourists. The more information available, the more accurate would be the generated recommendations.

This paper describes the CRUMBS Travel Recommender System, which generates user models taking into account both implicit and explicit preferences about categories and data of tourists. These models are applied to infer the preferences of tourists who have no explicit preferences. Once preferences of tourists about categories have been calculated, a content-based algorithm predicts the interest of POIs for tourists according to their preferences.

The contributions of this paper consist on the design and integration of: (1) a user modelling algorithm combining the information available about tourists (demographic data, explicit preferences, ratings and tags) to generate user models and infer their preferences about categories, and (2) a hybrid algorithm combining a content-based and a collaborative filtering algorithm into a mobile TRS.

The TRS is social because it has been integrated on the social network of the CRUMBS project (crumbs.tid.es [Aug. 25, 2013]), which has created an entire geo-spatial social world enabling the users to consume the multimedia social content "stuck" in different places as well as leave "crumbs" (POIs) as traces of their own activities. Moreover, not only the Destination Management Office (DMO) can generate POIs, tourists can also generate and categorize new POIs.

This paper is organized as follows. First, Sect. 2 presents a summary of the state of the art. Section 3 introduces the mobile social recommender system, describing the user modelling and recommendation algorithms. Section 4 presents the prototype integrating the recommender and the results of the partial validation of the system. The final Section presents some conclusion and future work.

2 State of the Art

This Section presents the main research areas related to this paper: user modelling and Travel Recommender Systems.

2.1 User Modelling

The term "user model" can be used to describe a wide variety of knowledge about people (Rich 1983). The information about a user, including his/her preferences is usually stored in a personal data structure known as profile. Three important dimensions that characterize user models have been identified by Rich (1979):

- One model of a single, canonical user which is necessarily uncertain but can represent users who have not usually interacted with the system versus a collection of models of individual users.

- Models specified explicitly versus models inferred by the system on the basis of the behaviour of the user.
- Long-term user models which represent demographics or general interests of the user versus short-term user models that are suitable for a specific session or task.

The user model presented in this paper enhances a previous work based on stereotypes (Torre et al. 2013) and considers all the three dimensions. Firstly, it proposes a dynamic canonical user model based on the information available about tourists (demographic information, explicit preferences, tags and ratings). Secondly, models are based both on explicit data about users and information inferred from the tags and ratings they generate interacting with the system. Thirdly, user models are updated to build long-term user models taking into account the interaction of the user with the system.

Researchers have categorized examples of user modelling systems for tourism. Kabassi (2010) proposes a categorization of tourism user modelling systems based on the method of information acquisition: explicit, implicit or both of them. Moreno et al. (2012) categorize existing user modelling systems for tourism personalized recommender systems in three categories, which can be combined on the same system, based on the information used: demographic information, context-aware information and personal preferences.

2.2 Travel Recommender Systems

Travel Recommender Systems (TRSs) have been applied to recommend several tourism elements: from destinations to hotels, flights or POIs to visits when at the destination (Ricci and Werthner 2002; Fesenmaier et al. 2003). TRSs can be categorized in three main groups according to the algorithm they apply: content-based filtering, collaborative filtering or hybrid approach (Kabassi 2010). Traditional content-based filtering suggests items or services to a user, which are similar to those he/she bought or searched in the past by matching the characteristics of the item or service with the characteristics of the user that are maintained in his/her user model. In collaborative filtering approaches, recommendations are made by matching a user to other users that have similar interests and preferences. In this way, each user is suggested with items or services that other users, similar to the one interacting with the system, have experienced before. Finally, hybrid approaches combine content-based and collaborative filtering methods in order to exploit their advantages and reduce their deficiencies (Adomavicius and Tuzhilin 2005; Ricci et al. 2011).

Mobile TRSs increase the potential and research challenges of traditional TRSs (Ricci 2011). Recent examples propose the use of tags (Mikic Fonte et al. 2013) and user ratings to improve the quality of the recommendation (Yang and Hwang 2013). Gavalas et al. (2013) presents a detailed survey of mobile TRSs, proposing a classification based on the architecture style, degree of user-involvement, and

criteria deriving recommendations. Following such classification, the CRUMBS mobile TRS presented in this paper can be classified as a Web-based, pull-based, user constraints-based TRS.

3 Mobile Social Travel Recommender System

3.1 General Architecture

The CRUMBS TRS is based on a client-server architecture. The mobile client calls to the recommendation service and presents a list of recommended POIs on the mobile application. The server stores all the information and executes the user modelling and recommendation algorithms (Fig. 1). The recommendation service is published as a REST service returning a list of recommended POIs.

Regarding the input data required by the TRS, each POI can be related to different categories with different weights ranging between 0 (not related at all) and 100 (fully related). These weights are assigned during the creation of each POI. The system has 72 predefined categories nested in two levels. The main categories are: accommodation, cultural and history, education, gastronomy, government, health service, leisure and activities, miscellaneous, multimedia, nature, politics, religious building, services, shopping, social aim, sport, tourism, and transport.

Basic demographic information (age, gender…) and explicit preferences of tourists about the categories of the system are also taken into account. These explicit category-preferences (referred for simplicity as explicit preferences on the rest of the paper) represent the preferences consciously expressed by the tourist in a scale ranging from 0 to 100, with zero representing displeasure and 100 representing the best score. Moreover, tourists add tags to POIs describing their opinion about them and rate the POIs with values between 1 (most negative value) and 5 (most positive value).

The recommender flow is divided in two phases. The first one is the user modelling to generate individual user models or profiles to predict the behaviour and preferences about categories of tourists. Two types of inferred preferences are calculated with the same range as explicit ones (from 0 to 100): one from the tags created by tourists and the other combining the demographic information with the explicit preferences. Then, the inferred and the explicit preferences are combined to predict the preferences of each tourist about categories. Finally, ratings are applied by the collaborative filtering algorithm to find similarities between tourists on the assumption that people giving a similar rating to the same POIs share similar tastes.

On the other hand, the recommender applies a hybrid filtering algorithm to recommend POIs to tourists. This algorithm combines a content-based and a

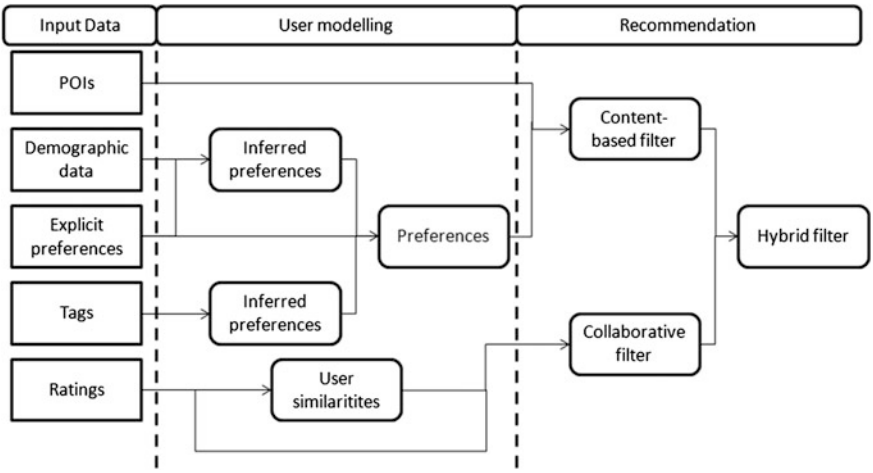

Fig. 1 General architecture of the CRUMBS social recommender

collaborative filtering algorithm. The former takes into account both the preferences of the tourists and the categories related to the POIs. The latter is based on the ratings and the similarities between tourists.

3.2 User Modelling

3.2.1 Dynamic Calculation of User Preferences

User preferences about a certain category of POIs are calculated combining those explicitly expressed by the user and the ones inferred by the system. Given one specific preference p about a category c, the following equation calculates it combining different sources for each user.

$$p = \begin{cases} \alpha_e * p_e + (1 - \alpha_e) * p_{i_T} & \textit{if the user has explicit preferences} \\ \alpha_D * p_{i_D} + (1 - \alpha_e) * p_{i_T} & \textit{otherwise} \end{cases} \quad (1)$$

where p_e is the value of the preference given explicitly by the user; p_{iT} refers to the value of the specific preference inferred from the tagging information; p_{iD} refers to the value of the specific preference inferred from the demographic data of the user; and α_e and α_D are system parameters referring to the weight of the explicit preferences and the ones inferred from the demographic data.

Regarding the calculation of the user preferences inferred from the tagging information, each time a tourist creates a tag about a POI, it is assumed that the tourist is interested on that POI and the categories related to it. Thus, the inferred preference p_{iT} of a tourist in a category c can be calculated as the average weights of all the tagged POIs in that category:

$$p_{i_T} = \frac{\sum^{p} w_{pc}}{|T_u|} * 100 \quad (2)$$

where Tu is the vector of all the tags created by a user u; P is the vector of the POIs related to the tags created by the user u; and w_{pc} is the weight of the relation between a POI p from P and a category c, introduced when a user creates the POI p.

Furthermore, the calculation of the preferences of the user inferred from demographic information is based on a model-based approach to take into account demographics about tourists in order to extract some patterns to help assigning preferences to new tourists. The data considered are the age, the gender, the relationship status, the city of residence and the nationality of the tourist.

In order to ease the acquisition of their demographic information, tourists can import their profile information from different social networks (Facebook, Google+ and Twitter) once they have given the required permission on a social network.

When a new user has no explicit preferences, his demographic information allows extracting some patterns that could help assigning preferences. First, model-based algorithms are applied to generate user models. For each category the demographic data of tourists with a explicit preference about the category are selected as learning instances for the model. For each category, three different learning schemes are used (linear regression, model tree and rules) applying their corresponding model available in open-source libraries (Linear Regression, M5P and M5Rules).

We created a synthetic strongly biased data set with 12 categories and 100 users, from which a third of users had random demographic information, a third of users were married women for a certain city with random age; and the last third were single women for the same city. Then, we assigned to 80 % of users a random value representing their explicit preferences about each category. During this process married women were assigned a value of 30 to the first category and single women a value of 100. We used this data to generate models and test the three learning schemes comparing the Mean Absolute Error (MAE). With this data set model rules led to the best results for the first category (the one with biased data). However, for the rest of the categories results shown that the selection of the best algorithm was dependant on the data of the learning instances.

Thus, instead of selecting a unique model as a default model for the system, at run-time one model is generated for each category and each learning scheme. Then, also at run-time, these three models are cross-validated and for each category only the model with the better MAE is stored. Finally, for each category the stored model is applied to predict the preference about the category for the users with no explicit preferences.

3.2.2 Similarities Between Tourists

The similarities between tourists are calculated from the POIs they rate applying a memory-based collaborative filtering algorithm. For each tourist, similarity with other tourists who have co-rated at least two POIs is computed using Pearson's correlation. Pearson's correlation corresponds to the cosine of users' deviation from the mean rating. Thus, it addresses variances in user ratings styles. For example, with a rating scale between 1 and 5, some tourists may give a rating of 5 to a liked POI and a rating of 3 to a disliked one, whereas another tourist with the same tastes will rate 4 a liked POI and 1 a disliked one.

As the similarity between two tourists is commutative and the similarity between one user and himself/herself does not provide interesting information, more than half of the values of the matrix are dismissed. Thus, the result of the collaborative algorithm is a triangular non invertible matrix with the similarity values among tourists $S_{N\times N}$. Moreover, and to get a better space efficiency, the update process of the matrix only considers the k most similar users (system parameter) for each active user as neighbours. These selected neighbours are stored on the database and used later in the computation of prediction for each active user within the recommendation phase.

3.3 CRUMBS Travel Recommender System

Collaborative filtering. On the basis of the available ratings and user similarities, the Resnick's algorithm (Resnick et al. 1994) is used to compute the prediction for a target item i (POI) and a target user a (tourist). Prediction p_{ai} is a numerical value expressing the predicted likeliness of a item i not rated by the active user a. This predicted value is within the same scale ([1,5]) as the opinion values provided by a.

$$p_{ai} = \bar{r}_a + \frac{\sum_{v\epsilon V} sim_{av}(r_{vi} - \bar{r}_v)}{\sum_{v\epsilon V} |sim_{av}|} \tag{3}$$

where V is the set of k similar neighbours that have rated i; r_{vi} is the rating of i for neighbour v; $\bar{r}_a$ and $\bar{r}_v$ are the average ratings over all rated items for a and v; respectively; and sim_{av} is the Pearson correlation between a and v.

Content-based filtering. The categories associated to each POI are defined by the author of the POI when this is created. Then, the correlation between the categories of the POI and the preferences of the tourist are computed using the vector similarity (Salton and McGill 1983). In the context of the CRUMBS TRS, tourists and POIs take the role of documents, categories take the role of words, and weights and preferences about categories take the role of word frequencies. The correlation between a user a and an item i is calculated by the cosine of the angle between the two vectors representing them:

$$\cos(a,i) = \frac{\sum_j w_{aj} w_{ij}}{\sqrt{\sum_{k \epsilon I_a} w_{ak}^2} \sqrt{\sum_{k \epsilon I_i} w_{ik}^2}} \tag{4}$$

where the summations over j are over the categories for which both user a and item i have a defined preference/weight, represented by w_{aj} and w_{ij} accordingly. I_a and I_i represent the group of categories set for user a and item i respectively. The cosine similarity computes ranges from 0 to 1, since the weights and preferences set to each category are on the [0,100] scale. As all the ratings in the system are within the 1–5 scale, the predicted likeliness p_{ai} of item i for the active user a will be calculated using a linear transformation:

$$p_{ai} = 4\cos(a,i) + 1 \tag{5}$$

After repeating the calculation for an active user over all the existing items, a ranked list of POIs is produced and returned as a recommendation.

Hybrid Strategy. The CRUMBS TRS is based on a hybrid strategy that combines the content-based and the collaborative filtering algorithms through a linear combination to achieve a more accurate filter than each method alone. Thus, a prediction is based on a weighted average of the separately computed predictions. If the prediction for a tourist a over a POI i obtained from the content-based filtering is pcb_{ai}, the one obtained from the collaborative filtering is pc_{ai}, and the system parameter x is the weight of the content-based prediction, the resulting prediction is:

$$p_{ai} = x * pcb_{ai} + (1 - x) * pc_{ai} \tag{6}$$

3.4 Implementation and Configuration

The CRUMBS Mobile Social Travel Recommender System has been implemented in Java using the Open Source Weka library (www.cs.waikato.ac.nz/ml/weka [Aug. 28, 2013]). Weka is a collection of machine learning algorithms for data mining tasks that contains tools for data pre-processing, classification, regression, clustering, association rules, and visualization. The recommendation service is available through a REST service that returns a list with the recommended POIs for a user.

We have run preliminary tests to tune the value of the parameters of the system with synthetic data with up to 1.000 users, 2.000 POIs and a fixed proportion of ratings: 50 % of users rate 25 % of crumbs, 20 % of users rate 10 % of crumbs, 20 % of users rate 50 % of crumbs and 10 % of users rate 100 % of crumbs.

The recommender has five configuration parameters. Firstly, the weight of each type of preference about the categories has been set to 0.7 for the explicit preferences (α_e) and 0.4 for the preferences inferred from the demographic information (α_D).

Secondly, in order to establish the size k of the neighbourhood, we have measured the relation between MAE and the size k to make a compromise between k and the calculation time. Tests have shown that increasing the size of the neighbourhood only leads to slight improvements on MAE. The optimal value of k will depend on the rating data and the time available for calculation, but a neighbourhood size of 100 returned good quality results with different data sets.

Thirdly, as both the content-based and collaborative filtering techniques have high significance for the generation of hybrid recommendations, they have the same weight ($x = 0.5$).

Moreover, the maximum size of the list of recommendations to be returned by the REST service has been set to 10 to avoid presenting too many options on the mobile application. Finally, in order to be able to deploy the algorithm in a different scenario, the recommendation algorithm can be switched from the hybrid one to just the content-based or collaborative one.

These tests also shown that the calculation time of the algorithms generating the user models and finding the similarities between tourists, exceed the real-time calculation (less than 5 s). Thus, some optimization techniques were required in order to obtain recommendations in real-time. First, as the user modelling algorithms do not require strict real-time execution, the related processes have been scheduled to be executed offline at night. Results of the calculated preferences and the similarities between tourists are stored on the database. Then, the recommendation algorithm retrieves this information from the database, generating a list of recommended POIs in real-time.

In order to further reduce the response time (below 1 s), recommendations are also generated offline and stored on the database daily. When a tourist asks for a recommendation, it is retrieved immediately if it is available on the database. For new users, it is calculated in real-time with a response time of less than 5 s.

Finally, as the recommendation of POIs is highly related to the current location of tourists, POIs are filtered according to the position of the tourist obtained from the mobile device during the recommendation phase. Thus, the amount of information to be processed by the algorithms is reduced, speeding up the calculation process.

4 Validation

4.1 CRUMBS Prototype

The Mobile Social Travel Recommender System has been integrated in the final prototype of the international CRUMBS project. CRUMBS proposes to re-organize information available in a social network based on the interaction of the users with their physical environments while wandering around. An entire geo-spatial social world has been created enabling the users to consume the multimedia social content

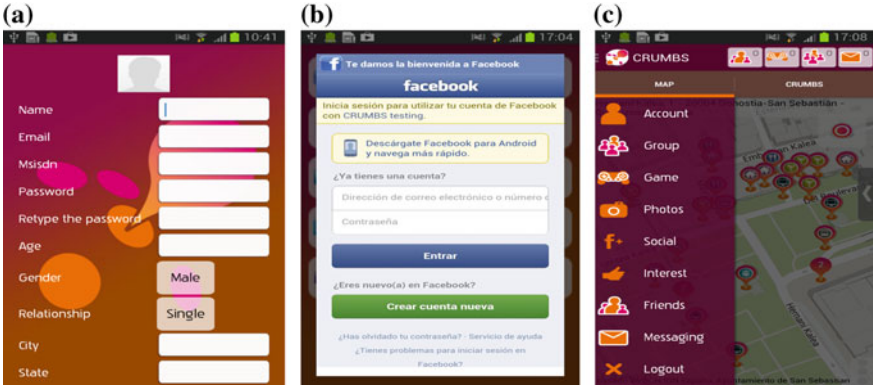

Fig. 2 Mobile application. **a** Demographic information. **b** Authorizing to import the information from Facebook. **c** Main menu

"stuck" in different places as well as leave "crumbs" (POIs) as traces of their own activities. This is enabled by exploiting the functionalities of advanced Location-Based Services and Augmented Reality engine, mixing enriched social media content with the real world images captured by the camera of the mobile phone.

The CRUMBS prototype has been developed as an Android application and the recommendation functionality is integrated as a REST service. The offline processes have been included on the cron service of the CRUMBS server to be run daily at night.

Tourists enter their demographic information (Fig. 2a) either when they register on the system or using the configuration sections once they are logged in. They can also import their demographic information from Facebook, Twitter or Google+ (Fig. 2b).

Tourists have an option called "Interest" on the main menu (Fig. 2c). This option opens a screen presenting some sliders to adjust their explicit preferences (Fig. 3a). When tourists ask for the recommendation, the application presents the POIs on a list (Fig. 3b) with their name and the estimated distance. If tourists are interested on a POI, they can access further information about it (Fig. 3c).

4.2 Validation

The final validation of the CRUMBS TRS will be held with real users on November 2013 in San Sebastian together with the validation of the CRUMBS prototype. However, a preliminary validation has been performed in order to verify the recommendation service and its performance integrated on the CRUMBS prototype. Moreover, partial validations are being held by members of the consortium of the CRUMBS project before the final validation.

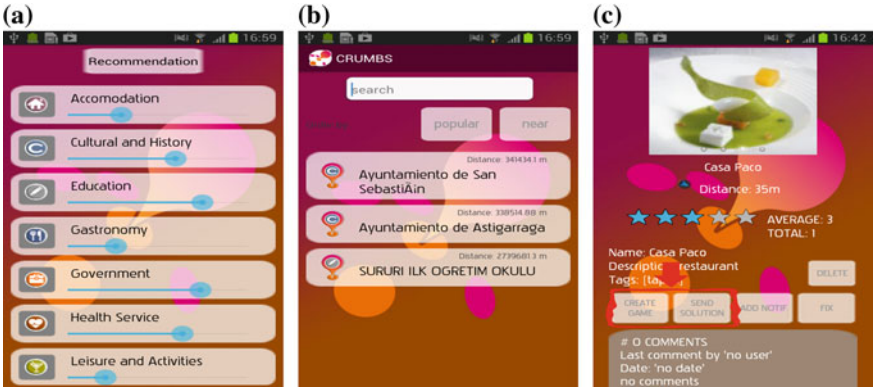

Fig. 3 Recommendation service. **a** Explicit preferences of a tourist. **b** List of recommended POIs. **c** Details of a POI

Preliminary validation. A preliminary validation has been performed with the synthetic data introduced on Sect. 3.4 to verify the recommendation service. The user modelling, content-based filtering and hybrid filtering algorithms have been tested with this synthetic data, successfully validating their performance based on their computation time. Regarding the collaborative filtering algorithm, the accuracy of its predictions has also been validated with an offline experiment using a dataset provided by GroupLens Research.

Finally, the recommendation service has been integrated on the prototype and published as a REST service that has been tested within a use case with three actions: registering a user, sending his/her position and obtaining a recommendation. These actions have been reproduced automatically with a testing software generating close to 100.000 queries in 30 min with a delay between calls between 1 and 10 s. The response time for the worst case (500 users), have been below 4 s, which can be considered acceptable at this amount of load.

Partial validation. Partial validations are being held by members of the consortium of the CRUMBS project following a qualitative approach based on focus-groups. Two different groups have been identified: end-users (Focus Group Interviews) and expert workshops (Individual In-Depth Interviews).

The validations are based on 18 use cases (including recommendation) covering the demonstration of the main CRUMBS services and letting the interviewed use the application to catch their feedback on usability issues, as well as impressions on the functionalities of the application itself. These evaluations are still uncompleted and no conclusion can be obtained.

However, first partial results show some interesting points related to the recommender system. These results have been obtained with two focus group and individual interviews with five experts. The first group is composed by a sample of 15 users who are 34–40 years old and are highly familiarized with technology and social networks. The second group is composed by a sample of 15 users who are

27–33 years old and are active Internet users, including forums, blogs and social networks. The experts have a domain expertise of mobile and wireless media and technologies either from an academic or industrial point of view, or both.

On these partial results the recommendation of POIs has been perceived as one of the most positive functionalities of the prototype: users describe it as a very useful service for mobile applications, especially when travelling or discovering new places.

Users were concerned mainly with the level of intrusiveness of the application and the lack of control over the user modelling and recommendation algorithms of the application. Some users would not like their actions be monitorized and registered permanently, they would prefer to be able to control this process: activate/deactivate the learning process whenever they want, and select things that can be learned or not. Moreover, some users would also like to control the actions influencing the user modelling algorithm, avoiding a not wanted action leading to not useful recommendations (for example if they select something they are not interested in). Regarding the recommendation algorithm, some users would like to have advanced options to limit the maximum distance to the recommended POIs or to select the type of algorithm generating the recommendation.

Finally, the requirement of connectivity to obtain recommendations was perceived as a negative characteristic of the recommendation service, and mobile tourism applications in general. Most users would like to use the service when they are abroad, but they disable the data connection abroad due to the high cost of international roaming.

5 Conclusions

This paper presents a Mobile Social Travel Recommender System. The recommendation process relies on information about POIs and the categories they are related to; demographic information and explicit preferences of tourists about categories of the POIs; tags about POIs generated by tourists; and POIs rated by tourists. This is the input data to the user modelling and recommendation algorithms proposed by the system.

During the user modelling phase, preferences of tourists about the categories are predicted combining explicit preferences with two types of inferred preferences. The first type of inferred preferences are calculated based on the tags created by tourists on the assumption that tagging a POIs suggests interest on the category related to it. Second type of inferred preferences are based on demographic information. For each category a user model is generated with the demographic information of tourist with explicit preferences about it. These models are applied to tourists with no explicit preferences to infer their preferences on the categories. Moreover, inside the user modelling phase the similarity between tourists is also calculated based on the assumption that tourists with similar ratings to the same POI have similar tastes. Then, a hybrid recommendation algorithm combines a

content-based and a collaborative algorithm to generate a list of recommended POIs to a tourist.

The recommender has been integrated in the mobile prototype of the CRUMBS project, which proposes to re-organize information available in a social network based on the users interaction with their physical environments while wandering around. Although the final validation of the prototype is planned for November 2013, a preliminary validation has tested the performance of the recommender. Moreover, first results of partial validations have detected some key aspects for tourists when using the system.

Future work starts with the final validation, as it is required to measure the real relevance of the recommender and the acceptance of the system. However, results from the partial validations are already pointing out key lines for the future work. Firstly, a solution giving tourists control of the information they share and the use of the information on the recommendation process is required to increase the trust of tourists in the recommender and the CRUMBS prototype. Secondly, integrating the recommendation engine with the mobile application in order to avoid the requirement of connectivity is an added value, mainly for scenarios where there are an important amount of foreign visitors.

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Mobile Apps Devoted to UNESCO World Heritage Sites: A Map

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Abstract As of July 2013, 981 properties in 160 States were enlisted by UNESCO as World Heritage Sites (WHSs), according to its "Convention Concerning the Protection of the World Cultural and Natural Heritage", signed in 1972. While the main emphasis of the Convention is on protection and conservation of cultural and natural heritage of outstanding universal value, also its presentation is included among UNESCO's goals. Information and Communication Technologies (ICTs) may help in fulfilling the goal of presentation, on the one hand opening up such properties and their meaning also to people who are not able to visit them, on the other hand supporting responsible and sustainable tourism by those who can access them, so that visitors can better understand and enjoy WHSs, becoming aware of their importance and of their fragility, hence behaving in a way that does not hinder their transmission to future generations. To better understand the role of ICTs for WHSs' presentation, this paper provides an analysis of mobile apps concerning WHSs, mapping them according to several factors, including covered sites and areas, main contents and functionalities, intended publics, costs, and presence of UNESCO-related info.

Keywords Mobile apps · UNESCO world heritage sites · Sustainable tourism

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1 Introduction

In 1972, the General Conference of UNESCO adopted the Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO 1972), aiming at the "identification, protection, conservation, presentation and transmission to future generations" (UNESCO 1972, p. 3) of the world's cultural and natural heritage of outstanding universal value, and encouraging cooperation among nations to accomplish this goal. This goal statement immediately evidences a certain dilemma that UNESCO and its member States have to face: on the one hand, WHSs are to be protected and preserved for future generations, they should therefore remain as untouched as possible and not be exposed to the potentially detrimental influence of visitors; on the other hand, these sites by definition are the universally outstanding heritage of mankind, and should therefore be presented and made accessible to people. Tourists are therefore an "inevitable destiny" (Pedersen 2002, p. 3)—or even "necessary evil"? (Ashworth 2012, p. 278)—and have to be considered in the management and planning of these properties. UNESCO's main strategy to meet this challenge is responsible and sustainable tourism (Pedersen 2002). This concept is today frequently used, and often abused, to describe tourism practices that aim at mitigating the industry's negative social, ecological, and economic impacts on places, in order to preserve them for future generations. More recently, researchers have been investigating how Information and Communication Technologies (ICTs) could be used in order to encourage and improve sustainable tourism practices (Touray and Jung 2010; Scott and Few 2013; Ali and Frew 2013). In fact, ICTs seem capable of, on the one hand, presenting sites and their meaning to people who may not or not yet be able to actually visit them, and, on the other hand, of guiding and sensitizing on-site visitors, in order to make them aware of those properties' importance and fragility.

Considering that the penetration of mobile technologies represents today one of the most significant trends in the eTourism domain (Egger and Jooss 2010; Kennedy-Eden and Gretzel 2012; Wang and Xiang 2012; Dickinson et al. 2012), the authors wanted to look at whether and how such technologies, in particular mobile applications, are offered today by sites that have an interest in encouraging and promoting sustainable tourism behavior. The present study is therefore focused on UNESCO World Heritage Sites, and aimed at answering two main research questions:

- Which of the UNESCO World Heritage Sites do currently offer a mobile application?
- What are these applications' main contents and functionalities?

Moreover, the authors hypothesized that the world heritage character of the sites would have particular design, structure and content implications, and that the uniqueness of each WHS would be reflected in very diverse and individually adapted applications. It is important to emphasize at this point that this study merely focused on the identification of WHS applications' contents and

functionalities, with no claim to assess their quality and their degree of fulfillment of users' needs. In order to carry out such evaluations, a usability analysis in the form of a user testing should be performed in the future, to complement the present research.

The following chapter presents existing literature with regard to mTourism, as well as the potential usage of ICTs for sustainable tourism practices. This section is followed by a description of the methodology applied in the present study, and by the presentation of the most significant results. In the subsequent section, these results are discussed and conclusions are drawn, before stating some limitations and potential future research directions.

2 Literature Review

Information and Communication Technologies (ICTs) have had and are having a profound impact on the tourism and leisure industry, giving rise to the multi-faceted phenomenon of eTourism (Buhalis 2003; Lassnig and Reich 2009). Tourism has always been at the forefront in embracing technological innovations (Poon 1993; Sheldon 1997), and it seems that after the Internet, mobile technologies are today most pervasively influencing the industry (Egger and Jooss 2010).

The growing field of mTourism (Egger and Jooss 2010) is closely linked to the increasing worldwide penetration of smartphones and related mobile applications (comScore 2013; Berg Insight 2013). Several classifications of the mTourism landscape (Kennedy-Eden and Gretzel 2012; Wang and Xiang 2012; Dickinson et al. 2012) reveal the complexity and variety of the phenomenon. In addition to more conventional mobile tourist guides (Rasinger et al. 2007; Kenteris et al. 2011), the main focuses of mTourism-related studies are today location-based, context-aware and personalization services (Höpken et al. 2010; Barragáns-Martinez and Costa-Montenegro 2013; Lamsfus et al. 2013), Augmented Reality (AR) (Yovcheva et al. 2013), as well as how mobile applications are used or could be used effectively and efficiently by various tourism suppliers such as airlines (Liu and Law 2013), theme and amusement parks (Brown et al. 2013), or hotels (Kim and Adler 2011).

Furthermore, recent studies (Lamsfus et al. 2013; Dickinson et al. 2012; Wang and Fesenmaier 2013; Kramer et al. 2007) have also shed light on how mobile technologies, in particular mobile applications, are actually mediating or impacting the tourist experience and behavior. Apart from significantly easing travelers' planning behavior, providing them with more flexibility and spontaneity during the on-trip phase, augmenting their contextual temporal and spatial awareness, and thus enriching the overall travel experience, smartphones and apps have also been found by the just cited authors to direct tourists' behavior by fundamentally influencing their choices and movements. These findings are of particular interest for the emerging field of ICTs and sustainable tourism (Touray and Jung 2010; Scott and Frew 2013; Ali and Frew 2013). In fact, mobile technologies could assist

in making tourists valorize more a specific place, and in simultaneously triggering more responsible and sustainable on-site behavior (Dickinson et al. 2012).

This significant potential of smartphone (or tablet) and mobile app usage in tourism could be of great value also for the management of UNESCO World Heritage Sites (WHSs). Representing unique properties of outstanding universal value, these sites face a considerable dilemma of reconciling the aims of "protection" and "presentation" (UNESCO 1972) by means of sustainable tourism (Pedersen 2002). However, no extensive research has been carried out so far to analyze if and how UNESCO WHSs use ICTs to tackle this challenge. The present study can therefore be seen as the first step of a research that aims at exploring whether UNESCO WHSs currently make use of mobile technologies, especially apps, for promotion, communication, and management of tourism.

3 Methodology

The main objectives of the present study were to find out which UNESCO WHSs already had a mobile application, and what were these apps' main functionalities and contents. The methodology applied for this purpose consisted of three main steps. Firstly, on July 21st, 2013, a list of all WHSs was created, indicating the name of the site, the respective continent and country, and whether it is a cultural, natural, or mixed heritage.

In the second step, on July 22nd and 23rd, 2013, a research in the Swiss iTunes Store was carried out to identify which WHSs already had a mobile application for iPhone and/or iPad. For this purpose, the names of the sites were entered into the search form in English as well as in German, Italian and French, three of the four official languages in Switzerland. Applications in any language were taken into consideration, but only those that were specifically dedicated to the respective WHS. Each application's link, its cost and related comments (if available) were considered. If several apps were available for one property, they were all listed but only one of them was selected for the subsequent analysis. In this selection, priority was given to apps with higher ratings (if available), apps that had received an award, apps from official sources (e.g. a Destination Management Organization), or apps whose description in the iTunes Store contained explicit references to UNESCO or to world heritage. If an app contained several WHSs in a region, it was also considered in the analysis. If a developing company, for instance eGate, iTourism, or VoyagerItS, offered identically structured applications for several properties, they were all listed, but only one of them was later analyzed exemplarily. In order to analyze one application per each of these providers, in three cases two applications for one site had to be analyzed. If several applications were offered by the same company, but had different, explicitly mentioned authors, they were all analyzed.

Furthermore, it is important to note that clearly distinguishable travel or city guides were not considered for the analysis, since the aim was to find applications

devoted to specific WHSs, not to entire cities or regions. Also apps consisting exclusively of maps, pictures, or videos were not accounted for in the analysis, even if they were dedicated to a specific WHS. The same goes for applications that were mere electronic versions of booklets or books, allowing only to swipe through pages of texts and pictures. Audio guides were considered instead, if they were dedicated to a specific WHS.

On July 24th and 25th, 2013, a research on the online platform Google Play was performed, with the exclusive aim to identify for which WHSs an Android application was available. Even if more applications were offered for one site, only one was chosen based on the above mentioned criteria, i. e. ratings, awards, official sources, and reference to UNESCO. If the only available Android application was identical to the/an iOS one, this was recorded for the following analysis. Since this research revealed that the number of WHSs with an iOS app was almost double the number of those having Android apps—140 versus 77—and that in fact about 65 % of the latter were identical to those retrieved in the iTunes store, the authors decided not to consider Android applications in the following analysis. An Android application was found for 77 properties, which in 50 cases was identical to the iOS app.

In the third step, the retrieved English, German, Italian, Spanish, Portuguese, and Czech iOS applications for iPhone and iPad were investigated with the help of an analysis grid designed to identify and rank the applications' contents and functionalities (Lizzi et al. 2013). This grid is based on indicators, i.e. pieces of content or functionality that should be relevant both for the domain and for the users (Cantoni et al. 2007). "Content" refers to information presented in the form of text, pictures, audio, or video; a "functionality" represents an action that can be performed by the user, such as searching or sharing (Lizzi et al. 2013). The list of relevant indicators for the domain of UNESCO WHS applications was determined by means of an explorative analysis, in which the inspectors browsed through a series of sample applications and identified their features with regard to contents and functionalities. These indicators were then bundled into categories and sub-categories. Following this, the authors inspected the identified applications' contents and functionalities by means of the created grid, indicating the presence or absence of an indicator in an application with the values 1 and 0 respectively. It is important to emphasize that the chosen approach being purely quantitative, it does not yield any information on the quality of the investigated apps. Due to a lack of language competencies, ten Japanese applications of one provider, and one Korean application could not be taken into consideration in this analysis.

4 Results

As of July 21st, 2013, the list of WHSs comprised 981 properties in 160 States Parties, 759 cultural, 193 natural, and 29 mixed sites. 29 properties were transnational, and consequently appeared at least twice in the list. The research in the

iTunes store revealed that mobile applications for iPhone and/or iPad existed for 140 of the 981 WHSs, 70 of them were situated in Europe, 41 in Asia, 13 in North America, 6 in South America, 5 in Africa, 3 in Oceania, and 2 in Central America. 99 of the properties with apps were cultural, 36 were natural heritage sites, and 5 were mixed. For 47 sites, more than one iOS application was available and 23 providers offered iOS applications for more than one heritage site.

Out of the 140 retrieved iOS applications 115 were analyzed. The remaining 25 applications were not considered due to language barriers, or due to the fact that another, identically structured app of the same provider had already been inspected. Of the 115 analyzed apps, 66 could be downloaded for free, 49 were for payment, with an average cost of CHF 2.65 (approx. €2.15). 72 of the analyzed apps had a version only for iPhone, 38 had one for iPhone and one for iPad, and 5 apps where only available for iPad.

Indicators have been inductively defined through an analysis of the types of contents and functionalities offered by selected apps, making sure that they could collectively cover all main aspects. Once the indicators (49) were identified, they were grouped into 7 categories (Table 1). These 7 major categories referred to the fields "General Information" (7 indicators), "UNESCO World Heritage Sites" (7), "Multimedia" (6), "Place" (6), "Tourism" (9), "Entertainment" (9), and "General Features/Settings" (5). In addition, data about the description available on the App Store and about intended audiences have been collected.

Looking at the presence of related indicators throughout analyzed apps, the most represented categories were "General Information" (49.9 %), "Place" (41.5 %), "General Features/Settings" (29.4 %) and "Tourism" (28.8 %). "Multimedia" (24.4 %), "UNESCO WHS" (19.0 %) and "Entertainment" (11.9 %) on average were the less present categories in the analyzed applications (Fig. 1).

Within the category "General Information" the most frequently present indicators were "Selected POIs/highlights/proposals" (80.0 %), "General description of the site" (70.4 %) and "History of the site" (70.4 %). For the section "Place", "Map" (80.9 %) and "POIs on Map" (60.0 %) were most frequent. Also, 58.3 % of apps provided location-based services or features. In the category "General Features/Settings" the indicators "Information on app provider" (66.1 %) and "Contact Information (Report Error/Suggestions)" (31.3 %) were most frequent. In the "Tourism" section, "Information on Transportation" (43.5 %) and "Information on Gastronomy/Restaurants" (39.1 %) were the most observed indicators. In the category "Multimedia", "Photo gallery/slide show" (67.0 %) and "Audio Guide" (26.1 %) were dominant, but only 11.3 % of apps offered virtual tours, 5.2 % AR features. This is rather surprising considering that especially AR is regarded as one of the major current trends in the mTourism domain (Yovcheva et al. 2013). As for the category "UNESCO WHS", "Information on WHS" (56.5 %) and "Year of Inscription" (31.3 %) could be found most often. Finally, within the least represented category "Entertainment", "Sharing by User: Other (Email, SMS, etc.)" (20.0 %) and "Sharing by User: Facebook" (18.3 %) were most frequent.

Table 1 List of categories and indicators used for the analysis

Categories	Indicators	
General information	General description of the site	
	General description of the broader area/region	
	History of the site	
	Geography of the site	
	Opening hours of the site	
	Selected POIs/highlights/proposals	
	Suggested tour(s)	
UNESCO world heritage sites	Logo WHS	
	Logo UNESCO	
	Information on WHS	
	Information UNESCO/UNESCO convention 1972	
	Year of inscription	
	Explicit reason of inscription	
	Sustainability hints	
Multimedia	Photo gallery/slide show	
	Audio material	
	Audio guide	
	Video material/Youtube channel	
	Virtual tour	
	Augmented reality	
Place	Map	
	POIs on map	
	GPS/Show me on the map	
	LBS ("would like to use your current location")	
	Push messages/pop-ups	
	Trip planner	
Tourism	Information on transportation	
	Information on accommodation	
	Information on attractions	
	Information on activities	
	Information on events	
	Information on gastronomy/restaurants	
	Practical tourist information (e.g. ancillary services, weather, parking, shopping, security etc.)	
	Buy/Reserve (i.e. book a hotel room, tickets, etc.)	
	DMO/WHS contact info	
Entertainment	Games	
	Sharing by user (e.g. photos, videos, location)	Facebook
		Twitter
		Other (Email, SMS, etc.)
	Social media channel	Facebook
		Twitter
		Youtube
		Instagram
		Other (Google+ , Pinterest, vimeo, Flickr, Foursquare, blog, etc.)

(continued)

Table 1 (continued)

Categories	Indicators
General features/Settings	Language choice
	Search
	Information on app provider/developer
	Call useful numbers
	Contact information (Report error/Suggestions)

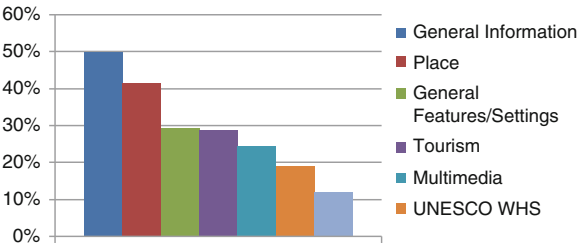

Fig. 1 Average presence of categories

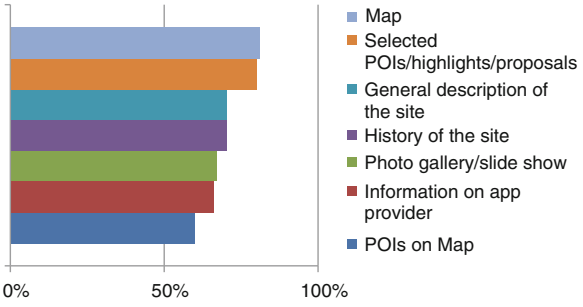

Fig. 2 Most frequently present indicators

Overall, the most frequently present single indicators were "Map" (80.9 %, category "Place"), "Selected POIs/highlights/proposals" (80.0 %, category "General information"), "General description of the site" (70.4 %, idem), "History of the site" (70.4 %, idem) and "Photo gallery/slide show" (67.0 %, category "Multimedia") (Fig. 2). The least represented indicators were "Buy/Reserve" (1.7 %, category "Tourism"), "Social media channel: Instagram" (0.9 %, category "Entertainment"), and "Trip Planner" (0.9 %, category "Place").

Having a closer look at the category "UNESCO World Heritage Sites", the analysis showed that the WHS logo and the UNESCO logo were present only in 12.2 % and 11.3 % of apps respectively. 56.5 % of the analyzed applications contained explicit information about the fact that the respective site was actually a world heritage; the year of inscription was mentioned by 31.3 %, the actual reason of inscription by 7.8 %. Rather rarely, specific sustainability hints (9.6 %) or information on UNESCO and its Convention of 1972 (4.4 %) were provided.

Fig. 3 Screenshots of the applications dedicated to Zollverein, Rhaetian Railway, and Cornwall (from *left* to *right*)

On average, 14 of the 49 indicators were found in an application. The highest number of present indicators was 25 in the application dedicated to the Yellowstone National Park (USA), followed by 24 indicators in the application for Ha Long Bay (Vietnam), 23 indicators in those on the Rhaetian Railway (Italy/Switzerland), Syracuse and the Rocky Necropolis of Pantalica and Villa Romana del Casale (Italy), Cornwall and the West Devon Mining Landscape (UK), the Royal Palace at Caserta (Italy), and the Olympic National Park (USA), and finally 22 indicators for the Zollverein Coal Mine Industrial Complex in Essen (Germany), the Historic Center of Macao (China), and the Hawaii Volcanoes National Park (USA). Among these most complete applications, Fig. 3 exemplarily illustrates those dedicated to the Zollverein, which has integrated social media, to the Rhaetian Railway, featuring a map with various POIs, and to Cornwall, that provides information on the world heritage character of the site as well as the WHS logo. The number of indicators that are included in an application is of course a purely quantitative score, and the chosen approach does therefore not provide information on the analyzed apps' quality.

Regarding the applications' description on the iTunes Store, 45.2 % contained information about the respective property being a WHS; 7.0 % indicated also the year of inscription. In 19.1 % of iTunes descriptions, the availability of offline features was mentioned explicitly. As a matter of fact, some applications were fully functional offline, some offered online and offline modes, others provided some offline contents and functionalities, such as maps, location-based navigation, or multimedia, but required online connection for all other functionalities. This information might be of particular interest for tourists coming from abroad to visit a site, since they are interested in avoiding high data roaming fees.

Based on the contents and functionalities, as well as on design and navigation features, the authors made a qualitative assessment of the main publics each

application most probably was directed to. A vast majority of the apps clearly aimed at addressing tourists (96.5 %) and offered at least some contents that might be relevant for visitors, such as, for instance, information on transportation, accommodation, gastronomy, events, activities, POIs, or a site's history, as well as maps, pictures, audio or video material. 31.3 % of the applications appeared suitable also for educational purposes, for instance in the context of a school excursion. Such usage was almost never mentioned explicitly within an app or in its iTunes description, but was concluded by the authors if illustrative multimedia, such as audio or video material, were available, as well as quizzes, extensive background information, and comprehensive, scientifically founded, but still easily understandable and clearly structured site-related information. Such features would allow a teacher, for example, to show the application on an iPad in front of the class and to use it as a supportive, educational tool. Several applications contained quite complex and scientific site-related contents that may be useful for researchers or scholars (22.6 %), whereas rather little material seemed to be dedicated to locals (13.0 %) or children/adolescents (8.7 %). Again, these figures are the outcome of the researchers' interpretation, who supposed that locals might be more interested in recent site-related information and news, in local events, and in app features that could further enhance their knowledge about a place, such as AR; children or adolescents, instead, were assumed to favor very colorful and fancy designs, advanced multimedia functions such as virtual tours and AR, games and challenges, social media features, and any kind of interactive application functions. Also, if an application contained very little to no scientific information and used a rather simple text and syntax style, children and adolescents were considered a potential desired audience.

5 Discussion and Conclusion

The research in the iTunes store showed that 50 % of all available WHS mobile applications were for properties in Europe. This can partially be explained by the fact that Europe is the continent with the highest share of world heritage properties (around 41 %). Around 4 % of retrieved apps were for African sites, which is below Africa's share of WHSs (around 13 %); for Asia, the respective rounded percentages are 29 and 26 %, for Central America 1 and 1 %, for North America 10 and 4 %, for Oceania 2 and 3 %, and for South America 4 and 12 %. These figures show that apparently European, Asian and North American WHSs—or other relevant stakeholders—are investing more into mobile technologies for communication and marketing purposes.

Regarding the contents and functionalities, it was striking that the majority of analyzed applications did not differ significantly from rather conventional city or tourist guides. This shows that so far, the world heritage character of a place does not seem to have a considerable impact on the content, design and other features of the application. In fact, 43.5 % of the apps did not even mention the fact that the

respective site was a world heritage. Also, only in few cases the application tried to educate and inform the user about the need for sustainable and responsible behavior (9.6 %), or about UNESCO, its mission and its values (4.4 %). In the authors' opinion, the potential of mobile ICTs for these purposes is currently not exploited sufficiently by the WHSs. The fact that only few applications showed the WHS (12.2 %) or UNESCO (11.3 %) logo, may be explained by the fact that UNESCO applies rather strict policies to the use of their visuals, so that either publishers did not think they could comply with them, or they did not want to undergo a quite long procedure. However, the display of these emblems would without doubt increase the authenticity and credibility of an app for the user.

Looking at the main desired audiences of the apps, it was already stated that almost all of them seemed to address tourists (96.5 %). Since UNESCO WHSs represent historically meaningful, unique natural and cultural treasures of the world, a visit to such sites could, however, also have educational and scientific purposes. Among the analyzed mobile apps, only 31.3 and 22.6 % respectively catered for such usages: integrating more educational and scientific contents could make such applications an innovative and useful tool for professors or teachers both to inform themselves and to teach their students.

Finally, it was surprising to the authors that "Entertainment" was the least present category in the analyzed applications (11.9 %). Only very rarely, sharing by the user (18.6 %), gamification (10.4 %) or integration with social media channels (8.2 %) was used in order to make an application more appealing especially to younger audiences. It goes without saying that particularly the integration of sharing and social media features would be indispensable in order to engage users and to create word-of-mouth about the application and the site.

6 Limitations and Future Work

Regarding limitations of the applied methodology, it has to be mentioned that, the researchers being located in Switzerland could access only the Swiss iTunes Store, which may have limited the number of retrieved applications and of available ratings. In addition, the presence and functioning of location-based and AR features was difficult to identify, given that the authors were not physically present at the respective sites. Furthermore, only iOS applications were taken into consideration for the analysis of contents and functionalities. Also, in the indicator-based analysis some applications could not be considered due to language barriers. Finally, the indicator-based analysis is fundamentally quantitative, and does therefore not allow for direct qualitative judgments.

Future studies could investigate the mobile applications provided for Android. Moreover, more research should be dedicated to the questions of how mobile applications for UNESCO WHSs should be structured and designed, what contents and functionalities they should contain, as well as whether and how mobile technologies can assist WHS managers in promoting responsible and sustainable

tourism. To do so, the analysis presented in this paper, whose scope was limited to the applications' contents and functionalities, can be significantly enriched and complemented by including an analysis of usages of such apps by travelers and a measurement of their satisfaction. For instance, a usability study in the form of an on-site user testing and/or in-depth interviews with users could yield interesting findings regarding the visitors' interaction with the applications, as well as concerning the actual quality of the analyzed apps and their correspondence to users' needs. Another type of user testing could also be carried out to provide answers to the question of whether mobile applications can offer to people who are unable to travel to the respective site the same or similar experience compared to those who actually visit it. Moreover, WHS managers should be included in such types of usability studies, in order to provide an evaluation of the applications' alignment with UNESCO goals.

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An Analysis of Mobile Applications Classification Related to Tourism Destinations

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Abstract The widespread use of mobile devices in daily life activities has impelled a growth in the development of applications (apps) for different purposes. Tourism is one of these spheres of activity in which mobile apps have been developed to support visitors. However, there is not enough understanding of the features that foster the relevance or popularity of a tourism app. Consequently, this paper will analyse the features of specific destination-related apps in Google Play. This analysis will shed some light on generic features of these applications in order to identify potential patterns that correspond to better positioning in searches related to the selected destinations. With this purpose, the research has performed a daily automatic massive collection of data by means of a crawler. Obtained results will provide a brief overview of the characteristics of the most successful applications and could provide some insights in the design and development processes of tourism mobile apps.

Keywords Mobile applications · Statistical analysis · Quantitative analysis · Tourism · Destination

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1 Introduction

The current convergence of the social, physical and virtual realms is boosting a change in the ways humans interact with their environment (Bloem et al. 2009). Daily activities have been eased by the mediation of technologies. Thus, an increasing number of people are taking advantage of the benefits of technology support. An example of this phenomenon is the change in how people use the Internet. A few decades ago, mobile Internet connection was very scarce. Consequently, information was accessed and consumed primarily from desktop computers with a land-line Internet connection. The recent technological development, however, has enabled the rise of the so called *Internet of Things* paradigm, in which devices are connected to the Internet, currently allowing 1.6 billion people to have constant access to information (Jara et al. 2013). Within this paradigm, the consumption of information in mobility has become a common thing, since it can effortlessly be done from any place and time. In fact, the estimation of mobile users is about four billion people, of whom 570 million utilize Internet-enabled mobile devices (Jara et al. 2013).

The proliferation of these new high-end mobile devices, commonly known as smartphones, has altered the way people access and consume information as well as how they interact with other individuals and their environment. Currently, mobile devices integrate various real-time positioning systems that have enabled the creation of advanced time and space contextualized services (Martín et al. 2013) and the consequent transformation on the access to information while on the move (Want 2009). Due to the intensive use of these kinds of devices and the natural interaction of users with the virtual world, some authors advocate for the existence of a so-called *Smartphone's generation* (Siewiorek 2012).

The impact of these mobile devices in the field of human mobility and tourism is particularly relevant, since the access to information is supposed to be helpful for users (Berger et al. 2003). These mobile systems are key for the consumption of huge amounts of information with no time or space boundaries. Therefore, the access to information can be linked to the precise time and place (i.e., context) of the users and become key to fulfil their needs (Lamsfus et al. 2013). This fact implies a change in travel behaviour within a destination (Okazaki et al. 2011). Currently, individuals have the means to manage and support their decision making processes throughout the trip, because this new situation allows them to book a flight, choose a hotel or check a list of events in real time. Furthermore, the information concerning the context in which apps are used can be exploited to generate more detailed knowledge about visitors' mobility at the destination. This could be used as evidence to support destination managers in their decision making processes (Shoval 2008).

Thus, taking into account the growing importance of mobile apps, this paper aims to analyse the most popular ones linked to tourism destinations. This analysis will identify some potential common features of description and classification of these applications. The paper is divided into five different sections. The first section is an

introduction in which the scope of the study is defined. Section two deals with the state of the art on the work performed in the field of mobile applications. This part of the paper emphasises existing works related to the classification of apps linked to the tourism sector. The next part of the paper deals with the use case selected and briefly describes the tool developed to capture data about the apps. Section four performs the analysis of the obtained data that will guide the final section of the paper, where some conclusions and further steps to be taken are highlighted.

2 Background

In light of the above facts, recently there has been a proliferation of research works dealing with information of mobile apps and their usage patterns. Some of them analyse massive captures of information from applications related to travelling (Wang et al. 2011, 2012; Wang and Xiang 2012). These works mainly focus on the analysis of users' comments about some selected apps. Overall, it seems that the scientific community in this field has primarily drawn its efforts to identify potential categories to classify tourism-related mobile apps. Thus, Martín-Sánchez et al. (2012) for example, have identified the categories of transport planning and travel guides, translators and communications in the realm of tourism. On the other hand, Kennedy-Eden and Gretzel (2012) identified a higher number of categories, among which entertainment, information, transactional, security, marketing, social and navigation can be cited. Finally, Grün et al. (2008), have identified the categories of accommodation, security, entertainment, food, navigation and guidance, news, practical information, shopping, sport, tourist attractions, transportation and time for apps linked to tourism.

As can be seen, each of the studies cited above follows different categories to classify the selected apps. Therefore, the lack of a standard categorisation for tourism apps makes it difficult to study their use, since apps could be categorised in highly transversal broad categories concerning different topics. Being it so, the works that have been reviewed allow some room for research. This paper proposes to link classification of categories and download data to searches about some selected tourism destinations. Analysing this fact, results will show if the most successful apps for tourism destinations share any kind of characteristic or if there is any pattern in the classification of these applications. Therefore, this paper will explain the connection between the apps and the destination they are linked to.

3 Use Case

In order to achieve this paper's objectives and perform the necessary analysis, it is necessary to collect as much information as possible about the currently available apps. Since the existence of multiple app markets makes it difficult to analyse all

of them, this work has focused just on Google Play.[1] This specific market was chosen because of its popularity and simple Web access. Reports indicate that Android is the most common operative system worldwide and its market share is predicted to increase in the coming years (Gartner 2013). Other app markets were disregarded for this analysis, either because they have a less significant market share, or because their access is more complex and makes it difficult for an automatic process to collect data from them. Hence, the analysis has focused on the apps accessible via Google Play in its Spanish version.[2] Due to the high number of apps in that site, the analysis has been restricted to the first page of results of the performed searches, as will be explained later. For each search, this page of results displays the 24 most relevant or popular apps.

The multiple searches that were performed and analysed daily produced a significant amount of data. Moreover, the variation of the results for each search and the position of the apps in the Google Play ranking, suggested that in order the results of this work to be more comprehensive a longer period of time had to considered to perform the search and the analysis. Thus, the manual analysis of the apps and searches was immediately disregarded and an automatic crawler was specifically developed to support these processes.

In any case, the first step of the search process has to be carried out manually. This step consists of an identification of the URLs corresponding to each destination and options provided by Google Play that had to be later analysed. Once the URLs have been identified, they are stored in the database (see Fig. 1).

Then, the crawler accesses the database to collect the previously saved URLs. It visits these websites and retrieves their source code. The link to the website of each app is to be found in this code. The crawler identifies this link and accesses the apps' website in order to retrieve the website's source code. The source code is an HTML code page including all the app-related information. This code is based on tags, and using these tags the crawler is able to read and understand all the information, extract the necessary data and store it accordingly in the database.

The crawler gathers, apart from the name of the application, all the quantifiable information present in Google Play. Therefore, description of the application and users' comments were not included, as these data would not be suitable for the designed analysis due to their qualitative character. Considering this paper represents just an initial step of a broader scope project, the following information was gathered: name of the application; category of the application; number of received votes from the users; date of last update; number of minimum version required; range of downloads; size of the application; price of the application; mean of the value of the received votes; performed query; ranking of the application in the performed query; and date of the query. The analysis has focused on the category selected by the developer when uploading the application to Google

[1] Google Play: https://play.google.com/store/apps. Last access: 24 June, 2013

[2] This is the predetermined version of Google Play according to the location of the researchers.

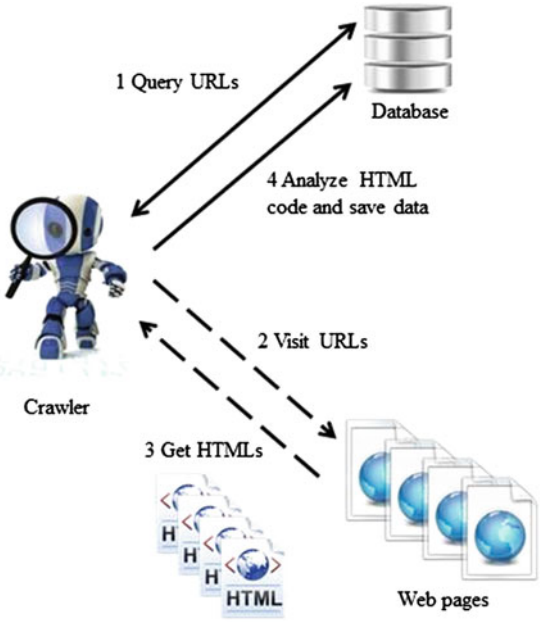

Fig. 1 Architecture of the developed crawler

Play,[3] the mean value of the votes of users, the range of downloads, the price of the apps and their ranking. The selection of these data has been made to answer to the objective of the research. In other words, the analysis of these data will identify if there is a predominant category in the results of the different searches, as well as the popularity of the diverse applications.

The collection of the data was performed between May the 24th and June the 23rd of 2013 and the locations for which data was collected are the Basque Country, San Sebastian, Vitoria and Bilbao. These terms have been chosen, because in this first stage the analysis has been limited to the Basque Country. This selection has been based on the knowledge of the area by the researchers. Consequently, results obtained from the analysis will be valid for this area and any extrapolation should be cautiously done. So as to take into consideration the linguistic diversity of each of the destinations and the visitors themselves, all the nomenclatures of the places have been included in Basque, Spanish and English. Accordingly, these are the selected search terms for the destinations: Euskadi, Basque Country, Pais Vasco, Donostia, San Sebastian, Vitoria, Gasteiz and

[3] When uploading an app to Google Play, the developer has to classify it according to one of the following categories: Arcade and Action; Books and Reference; Brain and Puzzles; Business; Cards and Casino; Casual; Comics; Communications; Education; Entertainment; Finance; Health and Fitness; Libraries and Demo; Lifestyle; Media and Video; Medical; Music and Audio; News and Magazines; Personalization; Photography; Productivity; Shopping; Social; Sports; Tools; Transportation; Travel and Guides; Weather.

Bilbao.[4] For each of these terms, multiple searches and collections of information have been carried out in Google Play. That information has been collected in order to identify different patterns of presence of the apps according to the category where the search has been performed. Google Play allows performing searches based on the relevance, the popularity[5] and the price of the apps. According to a previous exploratory approach, there are differences between these searches and, therefore, the following options of search have been considered in the research: relevance, popularity, relevance of free apps, popularity of free apps, relevance of paid apps and popularity of paid apps. Therefore, the total amount of searches done each day has been 48.

Each search process provided about a thousand new entries daily. During the selected period of time, the total amount of entries has been 30,736, with an average recollection of 641 entries per query or 992 entries per day.

The results obtained from this research will shed some light on the optimal strategies to name and classify tourism and travel content-related apps in order to gain a better place in the increasingly competitive current panorama.

4 Data Analysis and Discussion

Considering the information stored in the database, a statistical analysis has been carried out using IBM SPSS Statistics 19 in order to verify if the objectives of the paper are covered. The analysis of data has consisted of the calculation of the frequencies of the selected abovementioned selected information by query. Following, some general aspects of the searches and their results will be explained. Then, a tourism apps-related analysis of categories will be executed.

When analysing the number of apps returned in each query, some differences can be highlighted. In general terms, the number of different paid apps in each query is lower than the expected maximum number of 24 for the first page of the results of Google Play. That is to say, in every case, except for the terms *Bilbao* and *San Sebastian*, the number of paid apps both by relevance and popularity is lower than 24. So, it can be stated that the development of paid apps related to the terms of search for the selected destinations is not yet fully consolidated. This implies that developers tend to create more free applications than paid ones. When looking at the case of the query *Donostia*, even the free apps by *relevance* and *popularity* are lower than this number. This phenomenon expresses that the

[4] An exploratory approach to the differences between the terms Bilbao and Bilbo has shown that the differences are great, because at the time the crawler was implemented the applications responding to the search Bilbo were mostly linked to "The Lord of the Rings" and its character Bilbo Bolson. For this reason, it is the only destination without a search term in Basque.

[5] The relevance of a search refers to terms that appear in the description of an application and repetition rate of those terms. Popularity, on the other hand, looks for the number of incoming links referring to the specified term of search.

applications that fulfil the specified requirements of the searches are low. Or, in other words, the investment in applications that have the term *Donostia* in the title or the description is lower than the one made for the other terms. Regarding the analysis of the variation on the number of apps in the first page of the Google Play site, disregarding the queries that return a low number of applications (i.e., fewer than 24), the query with the term *Bilbao* seems to be the most stable one, with 24–26 apps in all the cases. Meanwhile, queries containing the term *San Sebastian* present the highest variation with values ranging from 28 to 30 different apps. The stability of more widespread and popular applications is more common than for other apps with a more limited reach in number of downloads and popularity. Since the results of Google Play are based on downloads, votes and relevance, the higher the scores in these variables, the more difficult to be overtaken by another application in the ranking. Therefore, it will be more difficult to become an application that appears in the first results in Google Play for these ones dealing with terms for destinations with more stable apps. For instance, apps responding to the term *Gasteiz* will easily become relevant or popular due to the low number of applications and their relatively low number of downloads than the ones with the term *Bilbao* or *Basque Country*.

Attending to the user valuation of the apps of each query, there are significant differences among the diverse searches. The valuation of each application in Google Play is made using a star ranking system. Each user can give between one and five stars to each application. Generally, free apps score a mean higher mark than paid ones in all the categories. Looking at the global values, the lowest ones are scored by the group of applications of *San Sebastian paid relevance* and *San Sebastian paid popularity* (1.69), followed by *Vitoria paid relevance*, *Vitoria paid popularity* (both scoring 2.28), *Donostia paid relevance* and *Donostia paid popularity* (scoring 2.44 in both cases). Contrarily, the highest scores have been identified in the queries *Basque Country popularity* (4.34), *Euskadi popularity* (4.28), *Euskadi free popularity* (4.21), *Vitoria free popularity* (4.21) and *Vitoria popularity* (4.20). Remarkably, the searches of the term *Vitoria* show dissimilar scores between the free and the paid apps. These facts might express that, in general terms, users' expectations with paid apps are higher than the expectations for free ones and, therefore, scored results are lower.

Finally, the difference of downloads when comparing merely *free* or merely *paid* apps is noteworthy, being the most common range of downloads of the latter 10–50 and of the first one 1,000–5,000. In fact, the lowest range of downloads of the free apps is 100–500. Actually, in the case of the San Sebastian query the *paid* categories have the lowest most common range of all downloads (1–5), but the *free* ones have the highest most common range of downloads (10,000–50,000). Therefore, the research has detected that users are more willing to utilize free apps than *paid* ones. This trend might suggest that, in order to be relevant or popular, tourism related apps would better be free.

In addition, a frequency analysis of the data stored in the database has been performed in order to identify the most common categories assigned by the developers to their applications. This analysis will determine if, for these specific

Table 1 Categories of apps in each query and percentage of presence

	Relevance		Free relevance		Paid relevance	
	Category	Percentage	Category	Percentage	Category	Percentage
Euskadi	Lifestyle	18.7	Travel and guides	20.8	Weather	28.6
Basque country	Travel and guides	26.7	Travel and guides	33.3	Travel and guides	45.5
Pais Vasco	Education	20.8	Education	20.8	Travel and guides	16.7
Bilbao	Travel and guides	35.8	Travel and guides	31.4	Travel and guides	48.0
Vitoria	Music	20.3	Travel and guides	20.4	Travel and guides	44.4
Gasteiz	Travel and guides	33.3	Travel and guides	30.6	Travel and guides	60.0
Donostia	Travel and guides	46.2	Travel and guides	42.0	Travel and guides	60.0
San Sebastian	Travel and guides	38.4	Travel and guides	37.9	Travel and guides	77.0
	Popularity		Free popularity		Paid popularity	
	Category	Percentage	Category	Percentage	Category	Percentage
Euskadi	Travel and guides	21.8	Travel and guides	21.8	Weather	28.6
Basque country	Travel and guides	44.0	Travel and guides	38.7	Travel and guides	45.5
Pais Vasco	Education	20.8	Education	20.8	Travel and guides	16.7
Bilbao	Travel and guides	26.1	Travel and guides	26.1	Travel and guides	39.7
Vitoria	Sport	20.8	Travel and guides	21.8	Travel and guides	44.4
Gasteiz	Travel and guides	34.8	Travel and guides	26.7	Travel and guides	60.0
Donostia	Travel and guides	45.9	Travel and guides	42.0	Travel and guides	60.0
San Sebastian	Travel and guides	40.5	Travel and guides	37.0	Travel and guides	77.0

destinations, tourism apps are among the most popular and relevant ones. Among the various categories available at Google Play to classify mobile apps, this work has selected the following ones as the most directly related to tourism: *travel and guides*, *weather* and *transportation*. These categories, as can be seen in Table 1, have been identified as the most common ones in most of the performed searches, since only seven out of 48 belong to another category. In fact, the *travel and guides* category is the most common one in 39 (out of 48) queries and the *weather* one in another two. It is worth mentioning that, except for the searches that return paid apps results, the queries with the term *Pais Vasco* do not provide results within the abovementioned three categories as the predominant ones. Notably, they are catalogued under the *education* category, which does not even appear as a significant category when dealing with other terms for the destinations. This can be result of the inclusion of the term *Pais Vasco* in the description of education-related apps dealing with contents of Spain and its regions. Consequently, it can be easier to become a popular and relevant app if the terms *Euskadi* or *Basque Country* are included in tourism related ones, than merely using the Spanish term.

Attending to the frequencies of the categories placed on the first place in Google Play, there is a remarkable variation. The highest percentage of presence for a category is the one of the apps related to *travel and guides* in the searched for paid apps linked to the term *San Sebastian*. In fact, more than three fourths of the obtained results are applications classified within this group. On the other hand, the lowest percentage of the preeminent category is also scored by the apps classified as *travel and guides*, but when answering to the searched of paid apps of the term *Pais Vasco*. Actually, in this case, only one out of seven applications is classified within this category. Taken all the queries globally, among the ones with significant number of apps,[6] most of them present percentages higher than a fourth but lower than half of the sample for the most common category. Consequently, it can be stated that, apart for the *San Sebastian paid* queries and those others with very few apps, there is not any category for classification of the apps in which more than half of the sample is represented in each query.

As mentioned before, the research has selected the categories *travel and guides*, *transportation* and *weather* as the tourism related ones. Subsequently, an analysis of these categories of apps has been performed regarding their position in the top ranking within each query. That is, the following analysis will state if the tourism related categories are within the three most popular ones of the top ranking related to the queries performed by the crawler. First, as mentioned previously, the *travel and guides* category is the predominant one in most of the queries. Only in nine queries this category is not the top one, but even in nearly all the other ones is present in the top three except for the queries *Pais Vasco relevance* and *Pais Vasco free relevance*, as can be seen in Table 2. Moreover, from the seven queries in which this category is not the top one, only in two of them it does not score a percentage that places it in the

[6] There are only five applications in the paid queries of the terms *Gasteiz* and *Donostia* and seven in the paid queries of the term *Euskadi*.

Table 2 Travel and guides apps in top three of each query and percentage of presence

	Relevance		Free relevance		Paid relevance	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi	2	16.7	1	20.8	2	14.3
Basque country	1	26.7	1	33.3	1	45.5
Pais Vasco					1	16.7
Bilbao	1	35.8	1	31.4	1	48.0
Vitoria	2	20.2	1	20.4	1	44.4
Gasteiz	1	33.3	1	30.6	1	60.0
Donostia	1	46.2	1	42.0	1	60.0
San Sebastian	1	38.4	1	37.9	1	77.0
	Popularity		Free popularity		Paid popularity	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi	1	21.8	1	21.8	2	14.3
Basque Country	1	44.0	1	38.7	1	45.5
Pais Vasco	3	13.4	3	13.4	1	16.7
Bilbao	1	26.1	1	26.1	1	39.7
Vitoria	2	19.1	1	21.8	1	44.4
Gasteiz	1	34.8	1	26.7	1	60.0
Donostia	1	45.9	1	42.0	1	60.0
San Sebastian	1	40.5	1	37.9	1	77.0

second place. More precisely, the *travel and guides* apps score the second highest percentage in five queries and the third one in other two. Besides, in all these categories, the percentage of presence is higher than ten per cent. Therefore, at least one out of ten apps for all these categories has been classified as a *travel and guides* one.

Looking at the results of the apps described as *transportation*, it can be seen that in no query they score the highest percentage of presence. Anyway, as shown in Table 3, their presence in the top three of categories takes place in more than half of the performed queries. In fact, only twenty of the performed queries do not present a percentage for transportation apps that place them in the top three of all the categories. Among these queries, sixteen searches have percentages that become *transportation* the second most popular category, whilst it is the third most popular one in twelve categories. Attending to the destination to which the queries refer, two very different patterns should be remarked. In effect, the queries by the term *Euskadi* have identified that in none of the cases this group of applications is present in the top three of the categories, while in all the queries related to the term *Donostia* the *transportation* category is placed on the second place. Actually, a percentage of one fifth or above has been identified in the latter. The category *transportation* is also present in the top of all the queries of the term *San Sebastian* and in nearly all of the terms *Bilbao* and *Gasteiz*. Thus, transportation apps seem to be closely linked to specific destinations rather than to broader ones.

Finally, analysing the apps in the *weather* category, this category appears in the top three only in four cases, as identified in Table 4.

Table 3 Transportation apps in top three of each query and percentage of presence

	Relevance		Free relevance		Paid relevance	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi						
Basque country						
Pais Vasco	3	12.9	3	12.9		
Bilbao	3	13.0	3	13.0	2	12.5
Vitoria					3	11.1
Gasteiz	2	12.5	3	12.5	2	20.0
Donostia	2	22.0	2	22.4	2	20.0
San Sebastian	2	21.0	2	20.8	3	4.2
	Popularity		Free popularity		Paid popularity	
	Position	Percentage	Position	Percentage	Position	Percentage
Euskadi						
Basque country	3	4.2				
Pais Vasco						
Bilbao	2	22.0	2	26.1		
Vitoria			3	14.7	3	11.1
Gasteiz	2	16.3			2	20.0
Donostia	2	22.0	2	22.4	2	20.0
San Sebastian	2	20.8	3	20.8	3	4.2

Table 4 Weather apps in top three of each query and percentage of presence

	Paid relevance		Paid popularity	
	Position	Percentage	Position	Percentage
Euskadi	1	28.6	1	28.6
Pais Vasco	2	16.7	2	16.7

Due to the low number of categories with any data for this query, only those ones with information will be reflected in this table

In all these cases, this phenomenon can be observed linked to paid apps. It should be highlighted that in two of these cases, namely the searches performed using the queries *Euskadi paid relevance* and *Euskadi paid popularity*, the weather apps are the top ones, with a percentage above one fifth of the identified sample. In the cases of *Pais Vasco paid relevance* and *Pais Vasco paid popularity*, this category scores the second highest percentages. Contrarily to what has been identified related to the *transportation* category, the *weather* category seems to be more linked to broader destinations than to more specific ones. Furthermore, this category is present in the top three of only *paid* apps searches. Consequently, it can be stated that, while the category *travel and guides* is popular in most of the performed searches, *weather* category is linked to more specific queries.

5 Conclusions and Further Research Lines

This work represents the first step in a broader research line that revolves around the development and use of mobile tourism apps. Some conclusions have arisen from this research. While queries related to broader destinations present a higher volume of downloads and even of applications, apps related to more specific destinations have a more limited reach in terms of download number and popularity. Similarly, apps linked to vernacular languages seem to be less popular than those ones in English. Therefore, for a broader reach of the apps, names of places should at least be included in English or in a widespread form in the description.

One of the difficulties identified in this work has been the existence of homonymous names for some of the selected destinations. For example, there are other San Sebastian named places in Madrid and the Canary Islands and some of the identified apps, even though they represent a small portion of the sample, are related to these places. Similarly, there is a larger Vitoria in Brazil and it also represents the name of a football team in Portugal. Consequently, in these cases, there is a need to specify which of the cities or entities the term refers to. So, in order to fully automate the search process, it could be convenient to create a semantic disambiguation engine for these terms.

Among the different app classification categories available in Google Play, the travel and guide category is the most popular one in the queries that have been performed. Thus, tourism related apps are popular within the selected searches. However, there are noticeable differences between the diverse categories related to tourism. For example, while *travel and guides* apps are common, *weather* related apps are scarcer. This makes it difficult to agree on a standard categorisation of tourism apps, since not only has the researchers' criteria to be taken into consideration, but also the categories available in a general market as Google Play or others. Matching these two interests seems something complex. In light of these facts, this paper suggests that, at least for the selected destinations, there are some clues about a possible strategy to name and classify an application. Firstly, to name and describe the application vernacular languages represent a limited market and, if nomenclatures in these languages are going to be used, it would be advisable to accompany them by their Spanish or English equivalents. Similarly, if there is any homonymous name, it would be helpful to provide the name of broader geographical entities in relation to the local one in order to univocally identify the destination.

Looking at the classification to be selected when uploading the tourism-related application to Google Play, the paper has also found some interesting results. Apart from the more generalized *travel and guides* category, another two have been related to tourism, namely *transportation* and *weather*. These categories, however, score higher in some specific geographic scales in the performed analysis. For instance, the *transportation* category scores better results if it is associated to local destination than to a broader one. The *weather* category, conversely, shows the opposite trend, since it does not score good results for local destinations.

Therefore, from the results of this paper, *transportation* apps should be linked to local destinations whereas *weather* apps to wider ones. Finally, if the aim is also to receive positive valuations by the users, free apps seem to fulfil more their expectations than the paid ones. Thus, the added value provided by a paid app has to be significantly much higher than the one provided by a free app in order to have really high valuations.

Summing up, the aim of this research has been to identify in a quantitative manner the generic data of description of mobile apps and their categories in relation to specific territories. In this sense, the analysis has highlighted some findings, but, as mentioned before on the paper, there is a need to also specify the stage of the travel process to which each mobile application is linked. Nevertheless, there is no standard categorisation that defines features or characteristics of the applications used in each stage. This would help to categorise the apps into a standard classification, depending on the stage of the travel process in which they are designed to be used. Thus, one of the further steps to be taken is the generation of a standard categorisation to allow developers to create mobile apps that meet the specific requirements of users in the selected phase of the travel.

Similarly, this contribution has focused on generic features of the groups of apps that fulfil the requirements of some queries. Anyhow, in order to be able to identify more precisely the most relevant applications available on the tourism market nowadays, it would be necessary to perform the analysis focusing on individual apps and not in groups of them. This new approach would facilitate the identification of the search terms in which each application appears. Therefore, this new approach would also identify the most common terms of search for relevant applications.

In order to be able to generalize the obtained results, the analysed sample should be broadened and embrace more global searches. In this sense, another further step to be taken is the inclusion of other destinations in the queries so that reached conclusions can be contrasted and verified with the ones obtained for other destinations. Equally, in order to count on a more universal sample, it would be sensible to extend the analysis to other app markets. Thus, it would be interesting to extend the study analysing the apps available in other markets, such as Apple Store, Blackberry World or Windows Phone Store, among others. Finally, and taking into account that information can be accessed through different mobile devices apart from smartphones, another interesting step to be taken would be the possibility of identifying and analysing the consumption and usage patterns of apps depending on the device in which they are executed.

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Hotel Mobile Apps. The Case of 4 and 5 Star Hotels in European German-Speaking Countries

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Abstract The importance of mobile internet for travel and tourism has been widely acknowledged, nonetheless the different typologies of mobile applications, their design and usefulness are still under researched. In order to contribute to such analysis, this paper studies the "supply side" of hotel mobile applications adopting two research approaches, which complement each other. First, it draws a comprehensive map of contents and services offered by 80 iOS mobile apps of 4 and 5 star individual hotels as well as hotel chains in European German-speaking countries. Second, beside such objective analysis, the point of view of hotel managers is considered, studying both those whose hotel/chain features an app, and those who are not or not yet offering one. The main drivers for publishing an app are: increasing the loyalty and promoting special offers as well as enhancing the interaction with the guests and providing information about the destination. The main reasons for not publishing an app are: perceived irrelevance for the business, absence of added value to the guests' satisfaction, difficulty to estimate the return on investment as well as lack of economic resources.

Keywords Hotel mobile applications · mTourism · Online communication · Mobile marketing

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1 Introduction

Due to the growing penetration of smartphones worldwide, the significance of smartphone applications in the tourism sector is strongly increasing. In particular, it is possible to access a wide variety of tourism and hospitality related mobile applications (Wang et al. 2010) that, among other things, include gaming, music, communication, social media, news, and booking features (Millennial Media 2013). Whereas the topic of mobile applications in tourism has been extensively investigated by various scholars (Wang et al. 2011, 2010; Wang and Fesenmaier 2013; Kennedy-Eden and Gretzel 2012), only little research has been carried out so far in the field of mobile applications in the hospitality industry (Buhalis and Yovcheva 2013). According to Schaal (2012), mobile applications of an individual hotel may be perceived as useless by users as the existence of numerous mobile booking applications seem to replace their function. However, for the next years a major change is expected in the hospitality sector: the focus is likely to shift from the pre-consumption phase, consisting mainly of room bookings and room presentation, to the consumption stage, which is characterized by "during the stay functionalities" such as hotel room upgrades, dining reservations, spa reservations, room environment controls and TV controls (Buhalis and Yovcheva 2013; EyeforTravel 2013; Hotelmarketing.com 2013).

Therefore, this paper aims at contributing to the literature on hotel mobile apps by analysing the current offer in terms of contents and services of mobile applications of independent and chain 4 and 5 star hotels in Austria, Germany and the German-speaking regions of Switzerland. Moreover, this research investigates hotel managers' perspectives, providing insights into their attitudes towards and adoption of mobile applications, and studying their perceived level of effectiveness of the features of such applications.

Finally, besides the contribution of this research to investigate an emerging sector, namely mobile applications and hospitality, it is argued that the results may help hotel managers who are interested in designing a mobile application for their hotels. Moreover, hotel managers may find it useful to refer to this study to benchmark the current strategies used in adopting hotel mobile applications, and to check their offer against the currently most and least offered contents and functionalities.

2 Literature Review

2.1 Mobile Applications in Tourism

Smartphones often assist tourists in their travels (Kenteris et al. 2009; Wang and Fesenmaier 2013) and have a significant impact on the travel activity (Wang et al. 2010). Wang et al. (2010) argue that today's travellers are constantly seeking for

information in order to reduce their uncertainty and they make use of their smartphones as travel assistants throughout all trip phases. Especially before and during the trip, they rely on mobile technologies to simplify the travel by searching for information about transportation, accommodation, attractions and activities. Travellers also use smartphones in order to communicate with others through emails, calls, text messages and social media. Furthermore, the phones also represent self-entertainment tools for gaming, listening to music, photographing, sharing pictures, watching movies or reading news.

Looking at the supply side, several categorizations of the mTourism landscape (Kennedy-Eden and Gretzel 2012; Wang and Xiang 2012; Dickinson et al. 2012) have been proposed to unfold the complexity and diversity of the field. Kennedy-Eden and Gretzel (2012) have created two taxonomies, the first one with seven categories, based on the services travel-related apps provide, namely "Navigation", "Social", "Mobile Marketing", "Security/Emergency", "Transactional", "Information", and "Entertainment", which are again divided into several sub-categories. The second is based on the level of customization and classified in seven main areas, ranging from "Personal Preferences"—which indicates the highest level—to "Location Sensitive", "Security/Data Control", "Control through Web", "Content Addition", "Aesthetic Changes", and ultimately applications that cannot be customized in any way and that offer no sort of interaction (ibid.).

Besides studying conventional mobile tourist guides (Rasinger et al. 2007; Kenteris et al. 2011), scholars are also investigating location-based, context-aware (Höpken et al. 2010; Barragáns-Martinez and Costa-Montenegro 2013; Lamsfus et al. 2013), augmented reality (Yovcheva et al. 2012) applications, as well as mobile applications in the business context of various tourism suppliers such as airlines (Liu and Law 2013), theme parks (Brown et al. 2013), or hotels (Kim and Adler 2011).

2.2 Mobile Applications in the Hotel Industry

Little research has been done so far regarding mobile applications in the hotel industry; however, several hypotheses suggest that the usage of a hotel mobile application might strongly link the customer to the hotel's brand and that such an app might increase brand awareness, which, in turn, could lead to stronger loyalty towards the hotel's brand (Kim and Adler 2011). From the industry's perspective, the TripAdvisor 2012 Industry Index survey (2012) confirmed this hypothesis by revealing that 47 % of worldwide and 54 % of German hoteliers planned to interact with their guests by using mobile applications in 2012. The most recent developments regarding hotel mobile applications draw on features from the airline industry (EyeforTravel 2013), a sector that is well-known for being an early adopter (Liu and Law 2013). Moreover, a shift from the pre-consumption phase, which mainly consists of room bookings, to the consumption stage is becoming visible, through functionalities such as online check-in, hotel room upgrades, dining reservations, spa reservations, room environment controls and TV controls

(EyeforTravel 2012, 2013). In addition, it is expected that also ideas from the restaurant industry will soon be adopted, for instance pre-ordering room services that allow skipping the line (EyeforTravel 2013).

Several hotel chains, luxury resorts and 5 star hotels already offer mobile applications, whereas independent hotels' mobile presence still appears to be rather weak (Kopsa 2012; O'Rourke n.d.). Mobile applications are provided more frequently by hotel chains, possibly because they are often faster to adapt to new technologies thanks to higher marketing budgets and resources, and because their clients may use them for trips to various destinations. However, most of these hotel mobile applications only provide basic functions such as an overview of the chain properties, a booking system and loyalty-program management (Fossel 2013; Hotelmarketing.com 2013). Nevertheless, some outstanding hotel mobile applications exist: Ritz-Carlton's app, for instance, uses a GPS technology in order to recognize the guest when he/she arrives and to send him/her location-specific advice (Fossel 2013). Another good example is the "state-aware" design of Starwood's mobile application, which changes the display according to the customer's current consumption stage (Hotelmarketing.com 2013). Moreover, Holiday Inn has introduced an augmented reality app, which allows guests to see virtual Olympic and Paralympic athletes in their own hotel room or in the hotel lobby (Buhalis and Yovcheva 2013). Thus, guests can watch for example Nick Dempsey, Britain's best windsurfer, surfing on their beds with the bed sheet (McKenzie 2012). When it comes to bookings carried out through mobile devices, in 2012 mobile bookings accounted for 7 % of bookings through hotel-owned online channels, a figure that is 12 times higher than in 2010. However, it seems that mobile booking systems are mostly used for last-minute offers (Hotelmarketing.com 2013).

This paper aims at contributing to the so far limited literature on hotel mobile apps, especially with respect to individual hotels, by investigating the state-of-the-art of hotel mobile applications of 4 and 5-star hotels in Austria, Germany and the German-speaking regions of Switzerland.

3 Research Design

The research consisted of two main phases: (1) a contents and functionalities analysis of 80 iOS hotel mobile apps in European German-speaking countries to map current hotel mobile applications; (2) an online survey of hotel managers to understand current strategies applied in the implementation of hotel mobile apps.

Phase 1: Hotel Mobile Apps. Contents and Functionalities Analysis

The sample for the content analysis consisted of iOS (the mobile operating system developed and distributed by Apple Inc) hotel mobile applications available in the Swiss iTunes Store from March 4 to April 18, 2013. Hotel mobile applications were selected, firstly, by identifying the top 25 touristic destinations in European German-speaking countries (i.e. Austria, Germany and Switzerland) according to the overnight stays in 2011 and 2012. This analysis was based on the

statistics provided by Statistik Austria, Statistisches Bundesamt in Germany and Bundesamt für Statistik in Switzerland. In the second step, a search in the Swiss iTunes Store was carried out within the "travel" category by inserting the keyword "hotel" plus the name of a previously identified destination and the country. An example of a search is thus "hotel+Stuttgart+Germany". Among 136 dedicated hotel mobile applications that were retrieved by the system, only 4 and 5 star hotels were considered. The number of apps was consequently narrowed down to 89, among which 66 belonged to independent hotels (25 from Austria, 24 from Germany and 17 from Switzerland), and 23 to hotel chains, meaning that several hotels were contained in one app. After adding the criteria that the hotel chains had to be listed under the top 20 hotel brands in the ranking of worldwide brands in 2012 or 2013 provided by MKG Hospitality (Hotel Online 2012; MKG Hospitality 2013), and that the apps had to be dedicated to a specific hotel, 14 hotel chain smartphone applications remained. All in all, the final sample consisted of 80 apps.

The retrieved iOS applications were investigated with the help of an analysis grid designed to identify and rank the applications' contents and functionalities (Lizzi et al. 2013). This grid is based on indicators, i. e. types of content or functionality that should be relevant both for the domain and for the users (Cantoni et al. 2007). "Content" refers to information presented in the form of text, pictures, audio, or video; a "functionality" represents an action that can be performed by the user, such as searching or sharing (Lizzi et al. 2013). The list of relevant indicators for the domain of hotel mobile applications was determined by means of an explorative analysis, in which the inspectors browsed through a series of sample applications and identified their features with regard to contents and functionalities. These indicators were then bundled into categories and sub-categories. The final grid contained 124 indicators grouped into six main categories of contents and functionalities: (1) the hotel itself; (2) the booking process; (3) the destination where the hotel is located; (4) social media interaction; (5) extras; and (6) settings.

Following this, the authors inspected the identified applications' contents and functionalities by means of the created grid, indicating the presence or absence of an indicator in an application with the values 1 and 0 respectively. It is important to emphasize that the chosen approach does not yield any information on the quality of the contents and functionalities present in the investigated apps.

Phase 2: Hotel Managers' Perceptions Analysis

A survey design (online questionnaire) was chosen in order to investigate the attitudes of hotel managers towards and their adoption of mobile apps for their businesses. A panel of 1,504 hotel managers from 4 and 5 star hotels in Austria, Germany and Switzerland were contacted twice between June 3 and July 14, 2013. The contact list of hotels was provided by a Swiss tourism event agency. Additionally, the online questionnaire was sent to the 80 hotels that had been selected for the contents and functionalities analysis in the previous phase.

The survey included four sections: in section one the managers were asked to indicate if their hotel already had a mobile app or was planning to develop one and if not, what were the reasons; in section two, the respondents should provide information about their strategies in designing a hotel mobile application; in

Section three they were exposed to various hotel mobile app functions and functionalities, which had emerged from the first research phase, and they were asked to indicate the level of importance of the indicators for their strategy. All items in Sect. 3 were measured using a 4-point ordinal scale ranging from 1 (very important) to 4 (unimportant) and including the option "NA—not applicable". Finally, Sect. 4 consisted of demographic questions that would help understand better the respondents' profiles.

In total, 35 hoteliers completed the survey, which corresponds to a response rate of 2.26 %. It should be underlined that low response rates ranging from 1 to 20 % are common in organizational surveys (Anseel et al. 2010).

4 Results

4.1 A Map of the Hotel Mobile Apps' Features in the European German-Speaking Market

The contents and functionalities analysis resulted in 124 features/indicators present in the hotel mobile apps in the European German-speaking market. The most frequent indicator was "indication of hotel location" (present in 89 % of hotel mobile apps), followed by "rooms description" (81 %) and "restaurant menu" (84 %). Furthermore, 78 % of the analysed hotel mobile applications provided their contact information; a description of the room amenities was present in 74 % of the cases, followed by the presence of a photo gallery (73 %). The option of booking online was slightly less present, (69 %) together with the possibility to call or send an email (58 %) in order to book a room. Interestingly, 60 % of the hotel mobile applications contained information regarding conference facilities and allowed instantly to check the availability of the rooms in a specific time period. In general, attention was also devoted to specific facilities, such as restaurants, saunas, and bars, 59, 55 and 54 % respectively.

As for the least present indicators, most of them were part of the category "extras and social media", namely Facebook recommendation (8 %), blog (6 %), podcasts (6 %), mPostcard (6 %), online reviews (6 %), restaurant reviews (3 %), Foursquare (3 %), games (3 %) and newspapers (1 %), suggesting an early stage of interest by hotels in providing interaction with the guests through their mobile devices. Also indicators within the category "Destination" showed a rather weak presence (e.g. attractions (31 %), shopping (25 %), things to do in summer (20 %), snow report (6 %), ski-shuttle service (4 %), ski ticket prices (1 %), etc.), which indicates that features linked to the destination where a hotel is located still appear to be considered but less importantly. Moreover, only few hotel mobile apps presented information about last minute booking (9 %) and virtual tours (4 %).

In order to understand which business directions hotels from different countries are following with their mobile applications, an *ad-hoc* matrix was designed,

grouping the features into four main categories that had emerged from the contents and functionalities analysis.

Figure 1 depicts a business direction matrix, where the extreme points on the horizontal axis indicate if an application highlights information about the hotel *versus* the application focusing on information about the destination where the hotel is located. On the vertical axis the extreme points are: the application tends to conversion/booking *versus* the application tends to entertain customers.

The matrix reveals three clusters: the first cluster "hotel/conversion" is situated in the upper left square. These applications place emphasis on information about the hotel and on booking or, in other words, on the pre-consumption phase of travel and selling. The second cluster "conversion/destination" is situated in the upper right square. Applications in this cluster are destination- and booking-oriented, meaning that they provide extensive information about the destination but also stress the booking option. Many German hotels seem to focus on these two characteristics that are part of the pre-consumption and the consumption phases. The lower left square represents the cluster called "hotel/share and entertainment" with hotel mobile applications that are experience- and hotel-oriented. They primarily provide information about the hotel and offer entertainment and social media features in order to enhance the hotel stay experience. Therefore, these applications mainly focus on the consumption phase, more specifically on the stay at the hotel. The matrix suggests that it is chiefly Swiss hotels that use such a combination. The lower right square called "destination/share and entertainment" is a combination of providing information about the destination and entertainment and can be regarded as an information guide for the consumption phase. However, only one Austrian hotel is present in this square.

4.2 Hotel Managers' Perspectives on Using Hotel Mobile Apps.

Among the 35 hotel managers who completed the online survey, 25 were female and 10 male; 21 respondents were 40 years old or younger, 12 respondents were aged between 41 and 60 years; 16 came from Austria, 12 from Switzerland, and seven from Germany. The majority of respondents declared to work in the sales and marketing department (13), followed by managers (12), assistants/interns (4), and front office employees (3). Among the 35 respondents, 23 indicated to not provide a hotel mobile application, whereas the remaining 12 had a smartphone application for their hotel.

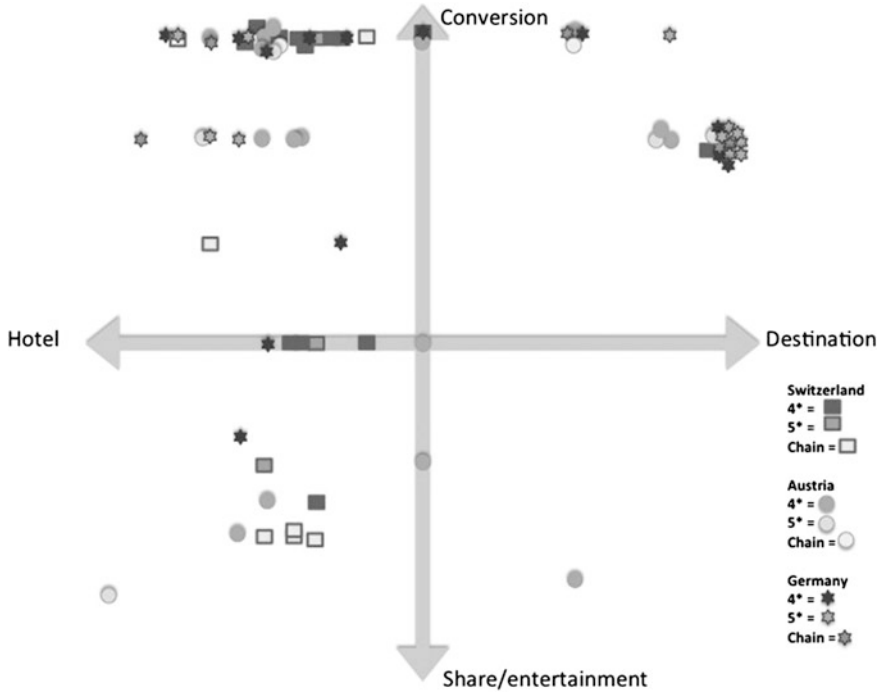

Fig. 1 Hotel mobile applications' business directions' matrix

4.3 Approach and Characteristics of Hotels Without a Mobile Application

All 23 respondents who reported not having an app come from independent hotels. 10 hotels are located in Switzerland followed by Austria (7) and Germany (6). Concerning the type of destination, most respondents (13) answered that their hotel was situated in a mountain destination, five belonged to a city hotel, and other five to hotels located close to a lake or a sea. Regarding the star rating, the majority of hotels (19) were categorized as 4 star or 4 star superior, and the remaining four hotels belonged to the categories 5 star or 5 star superior. As for the main audiences of the hotels, 20 hotels indicated to mainly attract couples, followed by families with children (15), groups (10), business travellers (9) and individual travellers (9).

Among the 23 respondents who answered that they did not have a mobile application, four planned to develop one within the next 12 months, while 19 hotels did not have and did not plan to develop a smartphone application. The main reasons why hotels had not implemented a mobile application were: (1) a smartphone application was not relevant for their business and would not add any value to their guests' satisfaction (10); (2) difficulty to estimate the return on

investment as an obstacle (8); (3) lack of economic resources to implement a mobile application (7). Six respondents provided specific reasons, key concepts of which are reported below:

- "Mobile applications are already out of fashion"
- "Word of mouth is better than mobile applications"
- "For an independent hotel an application is completely senseless. Everyone already downloads a lot of mobile applications and does not use them. On the other hand, a mobile version of a website is appropriate, we have it as well"
- "A mobile version of a website is a useful alternative to a mobile application for hotels since there is no need to install it and contents can be changed anytime without update"
- "First, we have to define how a mobile application can add value to the guest and afterwards we can start to think about the implementation"
- "Conservative attitude of the owner".

4.4 Perspectives of Hotels that have a Mobile Application

Eleven out of 12 respondents with a mobile application were working in independent hotels and only one in a chain hotel. 50 % of respondents (6) were located in Switzerland followed by Austria (5) and Germany (1). 8 respondents referred to their region as a mountain destination, three answered to work for a city hotel, and one described his/her hotel's region as a combination of lake and city. Regarding the star rating, the majority of hotels (10) belonged to the 4 star and 4 start superior category, whereas two respondents indicated that their hotels were rated as a 5 star. Concerning the main audiences of the hotels, nine of them mainly catered for couples, followed by business travellers (7), families with children (7), and groups (6). The least represented audience category was individual travellers with 4 responses.

Among the 12 respondents who declared to have a hotel mobile app, only five stated to track their mobile application downloads, indicating a download frequency of around 50 per month. Regarding the regularity of updates, seven hotel representatives claimed to update their hotel mobile application weekly or even daily, whereas five respondents said they would update it monthly or with a lower frequency. The majority of respondents (10) declared that their hotel mobile application was available in the iTunes Store. The second most frequent platform (8) turned out to be the Android market, followed by Blackberry (5) and Windows (4). All hotels offered their mobile application in German, whereas five of them give users the possibility to choose between German and English. One hotel mobile application was also available in Italian; other languages, such as French or Spanish, were not available.

Regarding the main goals that hotels seek to achieve with their mobile applications, 9 respondents stated that their hotel aimed at increasing customer loyalty

and at promoting special offers. Increasing interaction with the guests and providing information about the destination were the second most mentioned objectives (8), followed by "growth of bookings" (7) and "service quality" (6). Less pursued goals were "increase guest satisfaction" (3) and "add value to the guest experience by entertaining them" (2).

Results show a diverse use of mobile apps with regard to different publics. In particular, 11 out of 12 respondents are interested in reaching business travellers, followed by families with children and couples (10). With nine responses, individual travellers are the third most relevant audience group for hotels, whereas groups appear to be of less importance for most of them. Furthermore, the most significant target markets are domestic travellers (11), followed by neighbouring countries' travellers (5) and international travellers (4).

Concerning the usage of hotel mobile apps by guests, respondents declared that they had designed their mobile applications in order to reach the guests before they would book their hotel stay (9), and for the actual stay at the hotel (8). Half of the respondents (6) considered their smartphone application as useful for the phases between the guests' booking and their arrival at the hotel and after the stay at the hotel.

Based on the features found in the contents and functionalities analysis (first research phase), the hotel representatives were asked to indicate the effectiveness of the features corresponding to: (1) Hotel, (2) Destination, (3) Social media and entertainment. All respondents regarded the promotion of special offers and the description of how to get to the hotel as the most effective indicators. 11 respondents perceived general information about the hotel as important. Indicators referring to gastronomy, multimedia, room and table booking were considered significant by 10 respondents, a description of the rooms, provision of news and an overview of available conference facilities by nine, the room prices by eight respondents.

When looking at respondents' statements regarding information features about the destination where the hotel is located, results suggested an overall interest in the provision of such information. A total of 10 hotel representatives stated that providing information about summer and winter activities as well as events were important features. Also information about the destination in general (9), a webcam and weather forecasts (8), as well as sightseeing information (8) were rated as significant for a hotel mobile app.

Finally, the effectiveness assessment of features referring to social media and entertainment generally reveals that hotels perceive these elements as less important. However, all respondents declared that the possibility of sharing the hotel's webpage on Facebook was important, followed by the option to like the page (11). Inviting users to fill in an online review was also considered as a useful app feature (10). Only few hotel representatives (4) declared that games and newspapers were of importance to them. The least frequent indicators were podcasts and mPostcards, with three and two answers respectively.

5 Discussion and Conclusion

The analysis of the current offer in terms of types of contents and functionalities of mobile applications for independent and chain hotels in the European German-speaking market revealed that hotel mobile applications generally focused on informational and functional contents since the most frequently found indicators were related to hotel information and facilities, as well as to booking.

Moreover, indicators referring to the destinations where hotels are located also showed high frequencies, suggesting that hotels see the mobile application as an additional communication channel to enrich their clients' experience while at the destination. However, results indicated that hotels are not ready to design a smartphone application to directly communicate with the guests or to entertain them, although they mention interaction with their customers as one of the main goals of providing a smartphone application. Besides, these findings are substantiated by the two main identified clusters of hotels, one of which clearly concentrates on hotel information and booking, whereas the second one focuses on booking and information about the destination.

Concerning the hotel managers' perspectives on hotel mobile applications, it appeared that the majority of respondents' hotels did not provide a mobile application. Most frequently mentioned reasons for this choice were: a lack of relevance for their business, lack of clear indicators for estimating the return on investment, lack of money to implement mobile applications. However, among those who declared having implemented a hotel mobile application, the respective marketing goals appeared to be very diverse, and ranged from increasing loyalty, promoting special offers and growing bookings to increasing service quality. Likewise, the most important features for hoteliers were related to selling, as well as to information about the hotel and about the destination. Features associated with social media or entertainment were evaluated as unimportant except for Facebook and online reviews. To conclude, hoteliers currently design mobile applications to inform their guests about their hotel facilities and about the destination, and to invite them to book a hotel room.

6 Limitations and Future Research

Besides the contribution of this research to investigate an emerging study field, namely mobile technologies and hospitality, some limitations should be mentioned. Hotel mobile applications represent dynamic technologies that are updated and changed quite frequently. Consequently, the outcome of the analysis, which was carried out from March 4 to April 18, 2013, might not correspond to the current state of smartphone applications in the hospitality industry. Additionally, the small number of respondents to the hotelier survey limited the study, so that the results cannot be generalized. The low response rate may have been influenced by

seasonality: some of the hotels in the mountain destinations might have been closed when the survey was distributed. Moreover, the results could be biased since the survey was sent to the 80 hotels selected for the grid analysis that certainly had a hotel mobile application.

This research also indicates some future research directions. In particular, the perspective of the "demand side" should be investigated in order to understand the customers' standpoint regarding hotel mobile apps and their information needs. Moreover, other countries as well as hotels of ratings below 4 and 5 stars could be taken into consideration. Furthermore, the analysis of hotel mobile applications could be expanded to include other platforms such as Android, Blackberry, or Windows. Finally, the role and usage of destination and other tourism-related applications should be investigated in order to understand the peculiarities and added values impacting the decision-making process to download a hotel mobile application.

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The Effects of Presence Induced by Smartphone Applications on Tourism: Application to Cultural Heritage Attractions

Keumsil Lee, Hyung Ryong Lee and Sunny Ham

Abstract Increased use of mobile devices in the tourism industry enhances tourist satisfaction by improving their overall experience in particular settings. Presence, in this case, is the state of one's subjective recognition when experiencing in virtual realms beyond realistic physical and tangible spaces. The purpose of the study is to investigate the relationships between the presence brought upon the use of smartphone applications, the touristic experience, and tourism satisfaction, when smartphone applications are applied to cultural heritage attractions. A survey was employed for the data collection at cultural heritage attractions in Korea from tourists who had used smartphone applications during their travels. The study found a significant relationship between presence of smartphone applications and touristic experience, which also significantly affected overall tourist satisfaction. The study contributes to the body of knowledge on the impact and effects of "presence" when smartphone applications are utilized in tourism.

Keywords Smartphone application · Presence · Augmented reality · Mobile technology

1 Introduction

Smartphone applications, a new form of Information Communication and Technology (ICT), have been innovative by enhancing a tourist's interests in cultural heritage sites as well as these applications redesigning tourism resources into a sustainable platform. Cultural heritage tourism offers activities to help

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tourists understand the broad aspects of society, culture, and arts. In that sense, interpretation media plays a crucial role in the level of understanding, interests, and satisfaction of tourists (Kang and Gretzel 2012). Smartphone applications are unique from previous interpretation media. The menus of smartphone applications contain panoramas, videos, interpretation manuscripts, background music, narration, games, AR-based path finding, and SNS connection services (e.g., Facebook, Twitter, Kakaotalk). Of these, augmented reality (AR) is an experimental technique to overcome the physical constraints existing in the current state of cultural tourism at heritage sites. Tourists experience both reality and virtual realms through the innovative techniques of smartphone applications. Hence, interactivity between tourists and the techniques of smartphone applications needs to be addressed.

The idea of "presence" is the state of one's subjective recognition of being in virtual realms beyond realistic physical spaces. Presence induced by mobile devices has been studied in engineering, education, and industrial design where focused on technological aspects of human behaviour and positive or negative impacts of human behaviour on Human–Computer Interaction (HCI). In Korea, the focus of applying digital devices to tourism while experiencing cultural heritage attractions has been an expansion of the services being provided. Tourism is an industry generating tourists' experiences by selling tourism products (Sternberg 1997). In the process, culture, as an object to experience, affects tourists' behaviours. Therefore, cultural experience has been an important factor in expansion of the demand of cultural heritage attractions and tourist satisfaction (Richards 2001; Stamboulis and Skayannis 2003). By applying the concept of presence, the study intends to understand touristic experience and tourist satisfaction, when smartphone applications are employed.

The field of tourism has a scare amount of research when applied to the relationship between tourism and the value of technology. The purpose of the study is to determine if smartphone applications serve as an effective tool for mobile tourists in their experience with cultural heritage sites and artefacts. The study objectives are three fold when smartphone applications are applied to cultural heritage attractions: (1) To identify the dimensions of presence arisen by interactivity between tourists and smartphone applications. (2) To determine the realms of touristic experiences with cultural heritage sites and artefacts. (3) To examine the relationships among the presence induced by smartphone applications, touristic experience, and tourist satisfaction.

2 Theoretical Background

2.1 Presence

Tourism has been a popular area for smartphone based systems. Indeed, smartphones and other mobile devices (e.g., tablet, iPod based system, etc.) becoming more advanced, tourism has been one obvious application area of the mobile

devices (Brown and Chalmers 2003). When a tourist visits new places or unplanned places, Augmented Reality (AR) applications help him/her get information or find locations all around him/her easily. AR is a cutting-edge technology that allows a digitally enhanced view of the real world, connecting tourists to more meaningful contents in tourism destinations as a new city navigation. With the camera and sensors in smartphones or tablets, AR applications superimpose virtual information (e.g., photos, sounds, videos, etc.) in way of 3D or 4D directly onto real world around us (Chi et al. 2013).

Along with the development of mobile devices and a virtual medium and its environment where the mobile devices are played, many scholars have questioned about which medium or technology realistically represent physical and social environment as they are. In this context, researchers have paid attention to the feeling of presence (Lombard and Ditton 1997; Kim and Biocca 1997; Schubert et al. 2001). This concept has become central to theorizing advanced Human Computer Interfaces (HCI), such as virtual reality devices (Lee 2004).

Presence in a virtual environment is formed by virtual reality technologies (Sheridan 1992). Although a number of researchers studied the concept of presence, its definition has been still indefinite (Lee 2004). Witmer and Singer (1998) defined presence as a one's subjective experience of the feeling of belonging to certain places or environments where he/she physically is not. Previous studies summarized presence as the status of one's subjective recognition of being in virtual realms beyond realistic physical spaces, and also the phenomenon arisen from psychological and cognitive process. Object presence, a new type of presence, has appeared since the studies of AR were initiated (Stevens et al. 2002). Augmented reality refers to technologies that enhance the sense of reality allowing the coexistence of digital information and real environments (Azuma 1997). Thus, the concept of object presence is more appropriate when technology is mediated, where users feel a subjective experience of virtual objects in their real environment. The concept is different from the previously suggested type of presence where people feel totally immersed in virtual reality. And Social presence is another type of presence induced by mobile technologies. Durlach and Slater (2000) define social presence as a feeling of being with other people in virtual spaces. Short et al. (1976) refers to it as the feeling of salience with others in the course of interactivity between the user and technologies.

The topic of presence has been studied in the area of education (online education, classroom simulation, virtual campus etc.), entertainment (special effect movie, computer-video games), and communication (teleconferencing, computer-supported collaboration work). As mobile technologies have been gradually applied to tourism, there is a need to research the impact of presence on tourism.

2.2 Experience Economy

Pine and Gilmore (1999) proposed the four realms of experience: entertainment, educational, escapist, and aesthetic experiences, based on two criteria: the level of customer participation and involvement. On the customer participation axis, passive participation of the customer in business (or destination) offerings characterizes the entertainment and aesthetic dimensions, whereas educational and escapist dimensions reflect active participation (Pine and Gilmore 1999, p. 47). The tourist who passively participates in destination activities does not directly affect or influence the performance of the destination (business), whereas an active participant will personally affect the performance or event that becomes part of his or her experience. Along the absorption-immersion axis, the tourist typically "absorbs" entertaining and educational offerings of a destination and "immerses" in the destination environment resulting in aesthetic or escapist experiences. Absorption in this context is defined as "occupying a person's attention by bringing the experience into the mind" and immersion as "becoming physically (or virtually) a part of the experience itself" (Pine and Gilmore 1999, p. 31).

2.3 Tourist Satisfaction

Tourist satisfaction is important to the success in destination marketing, because it influences the choice of destination, the consumption of products and services, and the decision to return (Kozak and Rimmington 2000). Tourist (customer) satisfaction is the psychological status induced immediately from consumption experience (Oliver 1997). Tourist (customer) satisfaction has been identified as primary antecedents of purchase-related attitudes (Oh et al. 2007). Pine and Gilmore (1999) suggested that customers (tourists)' satisfaction increase, as the level of customer experience for the goods and services is higher. Light (1995) suggested that tourism satisfaction can be improved by offering a variety of experience and entertainment activities. Han (2006) showed that the dimensions of touristic experience in cultural heritage sites affected tourist satisfaction by employing the theory of experience economy.

3 Research Design

3.1 Research Model

The study examines the relationships between the presence induced by smartphone applications, the touristic experience and tourist satisfaction, when smartphone applications are applied to cultural heritage attractions. Figure 1 depicts the relations of the variables included in the study.

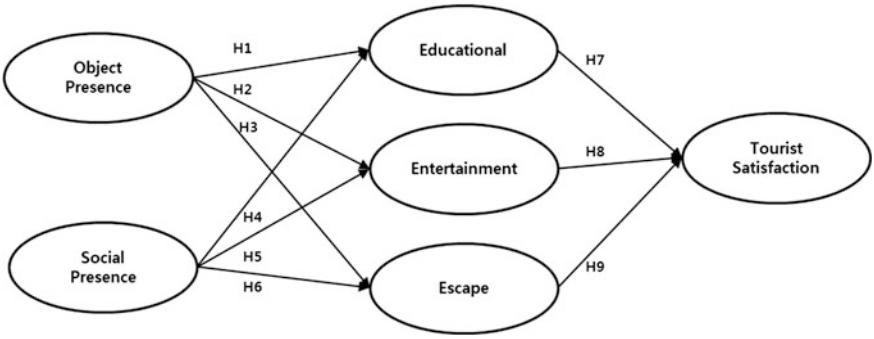

Fig. 1 Research Model

3.2 Hypotheses

Presence of Smartphone Applications and Touristic Experience. Touristic experience, defined as the status of on-site experience and lived experience, refers to the emotional phenomenon induced by the combination of cognitive interaction processes and emotional feeling which results from ones' encountering various physical and abstract objects or phenomena during the travel. The technique of SR induces presence which is the subjective recognition when users feel the existence of virtual objects in their real environment (Witmer and Singer 1998; Stevens et al. 2002). The services provided by smartphone applications, such as interpretation service and SNS connection service, formed social presence, which is the feeling of being with other characters (Stevens et al. 2002; Kang and Gretzel 2012).

Shelton (2003) performed a study in the field of education that AR technology-induced-presence enhances users' learning experiences. Kang and Gretzel (2012) demonstrated that presence induced by iPod based podcasting technology while on tour made a significant positive effect on the travellers' enjoyment experience and escape experience. Lee and colleagues showed that in the field of media, presence generated by feeling three-dimensional and four-dimensional movie improves four realms of experiences of audiences (entertainment, educational, escape and aesthetic) and experiential values. Based on the theory of experience economy suggested by Pine and Gilmore (1999), four realms of experiences were postulated, such as educational, entertainment, escape and aesthetic experiences. For the study context of using smartphone applications at cultural heritage sites, the aesthetic experience was not included due to its passive characteristics, which is not suitable in the mobile technology environment (Graetzel and Jamal 2009; Kang and Gretzel 2012). Thus, the hypotheses about the relationship of the presence induced by smartphone application and three types of touristic experiences (educational, entertainment, escape) have been proposed.

H1: *Object presence induced by smartphone applications will make a positive impact on tourists' education experiences*
H2: *Object presence induced by smartphone applications will make a positive impact on tourists' educational experiences*
H3: *Object presence induced by smartphone applications will make a positive effect on tourists' entertainment experiences*
H4: *Social presence induced by smartphone applications will make a positive effect on tourists' entertainment experiences*
H5: *Social presence induced by smartphone applications will make a positive effect on tourists' escape experiences*
H6: *Social presence induced by smartphone applications will make a positive effect on tourists' escape experiences.*

Touristic Experience and Tourist Satisfaction. A number of researchers suggested a positive relationship between experience domains and tourists' satisfaction, while they found out categories of experience domains from a variety of experience activities and entertainment factors of heritage touristic attractions (Light 1995; Mehmetoglu and Engen 2011; Oh et al. 2007). Previous literature showed that touristic experience has a positive and significant effect on tourist satisfaction. Therefore, the following hypotheses have been proposed.

H7: *Educational experience offered by smartphone applications will make a positive impact on tourist experiences*
H8: *Entertainment experience offered by smartphone applications will make a positive impact on tourist experiences*
H9: *Escape experience offered by smartphone applications will make a positive impact on tourist experiences*

4 Methodology

4.1 Sample and Data Collection

A survey was used as a research instrument in order to collect data as a means of testing the proposed hypotheses. Constructs for the survey were developed based on the literature and modified to fit the study purpose. For an empirical analysis, pre-test and main survey have been conducted in Changdeokgung. The palace reflects the history of Josheon Dynasty for about 500 years including 23 state-designated cultural properties and was designated as UNESCO's World Cultural Heritage in 1997 in Korea. The data from Changdeokgung were collected on site from April 22 to May 13, 2012. Survey was based on both paper and online that included questions

about the respondents' profiles (gender, age, income, educational level, etc.), respondent's mobile devices and usage (model, application name, using time, place to use) and visiting characteristics.

Both the convenience of sampling and a snow ball sampling were applied to the study. The survey participants were limited, who had experienced using smartphone applications '*Changdeokgung Palace Story*' at Changdeokgungin Korea. Before they have started a tour of Changdeokgung, a researcher had informed participants how *Changdeokgung Palace story* downloaded on their smartphone. Of the 460 questionnaires distributed, 222 surveys were included in the data analysis after excluding incomplete surveys.

4.2 Research Instrument

A survey, adopted measures from the previous publications of presence and modified them for the application in the tourism industry. All items in the survey use a five-point Likert-type scale (5 = strongly agree, 1 = strongly disagree). The survey consists of three parts. Part I has nine questions regarding a tourist's presence induced with smartphone applications. Smartphone application's presence is defined as tourist's subjective experience, which induced by a particular virtual object existing in a tourist's environment and is a feeling of being with other human or characters in virtual space when smartphone application mediated. The items, adopted from previous studies (Stevens et al. 2002; Schubert et al. 2001; Kim and Biccoa 1997; Kang and Gretzel 2012), concern the degree to which a tourist has a sense of being with particular object. For participants' understanding, a description was provided on smartphone applications and the particular application, such as AR. Part II includes items as to touristic experiences at cultural heritage sites based on smartphone application. Touristic experiences is defined as emotional phenomenon induced by the combination of cognitive interaction processes and emotional feeling which results from ones' encountering various physical and abstract objects or phenomena at cultural heritage sites. The items are modified from those of Pine and Gilmore (1999), Oh et al. (2007), Kang and Gretzel (2012), and Graetzel and Jamal (2009). Touristic experience was measured by fourteen questions for three sub-dimensions: four items for educational experience, three items for entertainment experience, and four items for escape experience. Part III contains three items for tourist satisfaction. Tourist satisfaction is defined as the summary psychological state arising immediately on the tourism destination from consumption experience (Oliver 1997; Oh et al. 2007). The items are modified from Oliver (1997) and Oh et al. (2007).

4.3 Data Analysis

The obtained data was analysed by using SPSS 18.0 for Windows and AMOS 18.0. Descriptive analyses have been performed on the all variables in the survey. Then, reliability test, exploratory factor analysis, and confirmatory factor analysis were conducted for the validity and reliability of the constructs. Finally, Structural Equation Modelling (SEM) was done to test the hypotheses of the proposed research model.

5 Results

5.1 Profile of Participants

Among the usable 222 respondents, 60.8 % were female and 39.2 % were males. The largest proportion of the participants is 1920s (88.7 %), followed by 1930s (9.9 %), while other groups of ages were minimal. In terms of education, majority (86.0 %) of the respondents had a university education or were attending university. For the marital status, 91.0 % were singles and others were married.

As to the frequency of visiting heritage attractions, about approximately 61.3 % of the respondents visited the cultural heritage attraction for the first time, twice (27.5 %), more than three times (11.3 %). As to the inquiry of time used for smartphone applications during the travel, over 42.8 % of respondents answered that they used smartphone applications for 1 to 1 and half hours, followed by 27.9 % of respondents for hour to thirty minutes, and 17.1 % for 90 min to 2 h.

5.2 Measurement Models

Exploratory Factor Analysis for Presence of Smartphone Applications. Table 1 shows the results of exploratory factor analyses for presence of smartphone applications, the exogenous variable for the study. The two factors whose Eigen values were higher than 1.0 were identified and they were labelled as "object presence" and "social presence" based on previous literature (Stevens et al. 2002; Schubert et al. 2001; Kim and Biccoa 1997; Kang and Gretzel 2012). All the factor loadings were higher than 0.6 (Anderson and Gerbing 1988), and these results explain 72.6 % of the variance in presence of smartphone applications.

Exploratory Factor Analysis for Experience Economy. Table 2 shows the results of exploratory factor analyses for experience economy, the endogenous variable for the study. Eigen values for all the three factors exceeded 1.0. Labels for the three factors were "education", "entertainment" and "escape" based on

Table 1 EFA for presence of smartphone applications

Construct indicators	Factor loading	Communality	Eigen value	% of variance	Cronbach'α (if deleted)
Object presence			4.667	58.343 %	0.823
The smartphone application came to me and created a new world for me, and the world suddenly disappeared when the smartphone apps ended	0.799	0.647			(0.821)
During a tour, I felt I was in the world the smartphone application created	0.809	0.702			(0.768)
During a tour, my body was in real world but my mind was inside the world created by smartphone application	0.723	0.730			(0.739)
During a tour, the smartphone application generated world was more real for me	0.639	0.650			(0.773)
During a tour, I never forgot I was in the middle of smartphone application generated world		Deleted			
Social presence			1.142	14.281 %	0.904
I felt I talked to someone close by me during a tour	0.852	0.764			(0.883)
During a tour, I felt I had involved with someone	0.853	0.786			(0.868)
I felt someone talked to me during a tour	0.820	0.733			(0.889)
I felt close to the others during a tour	0.847	0.798			(0.861)

KMO = 0.882, Bartlett's Test of Sphericity = 1,030.084 (df = 28, sig. = 0.000)
cumulative = 72.624 %, Factor rotation: Varimax

the previous literature (Oh et al. 2007). One item for escape experience (ESC4: I completely forgot about my daily routine) was excluded from the construct in that its factor loading was below 0.6. All factor loadings were higher than 0.6 (Anderson and Gerbing 1988); these results explain 75.2 % of the variance in experience economy.

Confirmatory Factor Analysis. The results of a Confirmatory Factor Analysis (CFA), using a maximum likelihood estimation method, indicate that model has a good fit to the data ($\chi 2 = 466.042$, df = 174, p = 0.000; RMR = 0.057, RMSEA = 0.080, CFI = 0.909; NFI = 0.863). A summary of the findings from CFA appear in Table 1. From construct composite reliability testing, the AVE ranged from 0.909 to 0.978 and CCR range from 0.973 to 0.992, which were above the recommended level of 0.70 (Fornell and Larcker 1981). This finding indicates that items for each construct variables are adequate level, which means each study variables have internal consistency. Discriminant validity is evident in that the squares of correlations between a pair of variables are all less than the AVE values for each of the study' constructs (Fornell and Larcker 1981) (Table 3).

Table 2 EFA for experience economy

Construct indicators	Factor loading	Communality	Eigen value	% of variance	Cronbach'α(if deleted)
Education			2.223	22.227 %	0.806
I learnt a lot during a tour	0.838	0.732			(0.744)
The experience made me more knowledgeable	0.857	0.761			(0.741)
It stimulated my curiosity to learn new things	0.600	0.546			(0.785)
It was a real learning experience	0.714	0.589			(0.760)
Entertainment			4.064	40.637 %	0.923
This activities during a tour were amusing	0.856	0.831			(0.907)
These activities were captivating	0.912	0.876			(0.898)
Activities in this tour were fun	0.911	0.891			(0.863)
Escape			1.234	12.338 %	0.846
I felt I played a different character here	0.845	0.718			(0.843)
I felt like I was living in a different time or place	0.874	0.777			(0.768)
The experience here let me imagine being someone else	0.889	0.800			(0.739)
I completely forgot about my daily routine		Deleted			

KMO = 0.779, Bartlett's Test of Sphericity = 1,239.531 (df = 45, $p = 0.000$)
Factor rotation: Varimax, Cumulative % = 75.202 %

5.3 Structural Model Fit

A Structural Equation Modeling (SEM) with a maximum likelihood, as an estimation method, tests the proposed model, and a summary of the results appears in Table 4. Findings indicate that the model represents the data satisfactorily ($\chi 2 = 422.330$; df = 176; $p < 0.001$; RMSEA = .080; CFI = 0.923; NFI = 0.876). The study's variables explain adequately the outcome variables. Particularly, explanation powers of each endogenous construct are as follows; educational experience (SMC = 0.031), entertainment experience (SMC = 0.059), escape experience (SMC = 0.271), and tourist satisfaction (SMC = 0.713).

As to the testing H1, H2, and H3, the effect of object presence on educational experience (H1: path coefficient $= -0.097$, C.R. $= -0.718$, $p > 0.001$), the impact of object presence on entertainment experience (H2: path coefficient $= -0.149$, C.R. $= -1.201$, $p > 0.001$), and the impact of object presence on escape experience (path coefficient = 0.111, C.R. = 0.958, $p > 0.001$) were not significant. H4, the impact of social presence on education experience (path coefficient = 0.234, C.R. = 1.752, $p > 0.05$) was not significant. For H5, social presence influenced on entertainment experience positively (path coefficient = 0.330, C.R. = 2.772,

Table 3 Assessment of measurement model

Observe	Std. λ	SE	CR[a]	AVE[b]	CCR[c]
Object presence				0.909	0.975
The smartphone application came to me and created a new world for me, and the world suddenly disappeared when the smartphone apps ended	0.585	0.093	8.45***		
During a tour, I felt I was in the world the smartphone application created	0.723	0.09	10.63***		
During a tour, my body was in real world but my mind was inside the world created by smartphone application	0.839	0.098	12.29***		
During a tour, the smartphone application generated world was more real for me	0.779	Fixed	Fixed		
Social presence				0.941	0.984
I felt I talked to someone close by me during a tour	0.811	0.061	15.32***		
During a tour, I felt involved with someone of my presence	0.851	0.061	16.66***		
I felt someone responded my talk during a tour	0.811	0.059	15.32***		
I perceived someone with me during a tour	0.882	Fixed	Fixed		
Educational experience				0.958	0.989
I learnt a lot during a tour	0.758	0.1	9.76***		
The experience made me more knowledgeable	0.756	0.099	9.75***		
It stimulated my curiosity to learn new things	0.659	0.106	8.66***		
It was a real learning experience	0.706	Fixed	Fixed		
Escape experience				0.925	0.973
I felt I played a different character here	0.703	0.069	11.16***		
I felt like I was living in a different time or place	0.827	0.074	13.14***		
The experience here let me imagine being someone else	0.885	Fixed	Fixed		
Tourist satisfaction				0.978	0.992
I am happy with my decision to visit	0.851	0.065	16.81***		
My experience here exceeded my exceptions	0.961	0.056	20.66***		
Overall I am satisfied with my visit	0.861	Fixed	Fixed		

$x^2 = 466.042$ (df = 174, $p = 0.000$), normed-$x^2 = 2.678$, RMR = 0.057, NFI = 0.863, TLI = 0.890, CFI = 0.909, RMSEA = 0.080

CR Critical Ratio = z-value, *CCR* Composite Construct Reliability

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

$p < 0.01$). And H6, social presence influenced positively on escape experience (path coefficient = 0.434, C.R. = 3.809, $p < 0.001$). Hence, H5 and H6 gained supports. For H7 and H8, touristic experiences affected tourist satisfaction positively (H7: educational experience on tourist satisfaction, path coefficient = 0.418, C.R. = 5.193, $p < 0.001$; H8: entertainment experience on tourist satisfaction, path coefficient = 0.522, C.R. = 7.586, $p < 0.001$). However, escape experience on touristic satisfaction (path coefficient = −0.044, C.R. = −0.946, $p > 0.05$) was not significant. Thus, H7 and H8 were all supported.

Table 4 Summary of structural model

Structural path	Standardized path coeff.	SE	CR	Assessment
H1: Object presence → Educational	−0.097	0.092	−0.718	Rejected
H2: Object presence → Entertainment	−0.149	0.120	−1.201	Rejected
H3: Object presence → Escape	0.111	0.143	0.958	Rejected
H4: Social presence → Educational	0.234	0.069	1.752	Rejected
H5: Social presence → Entertainment	*0.330*	*0.089*	*2.722***	*Supported*
H6: Social presence → Escape	*0.434*	*0.107*	*3.809****	*Supported*
H7: Educational → Tourist Satisfaction	*0.418*	*0.119*	*5.193****	*Supported*
H8: Entertainment → Tourist Satisfaction	*0.522*	*0.071*	*7.586****	*Supported*
H9: Escape → Tourist satisfaction	−0.044	0.037	−0.946	Rejected

$x^2 = 422.330$ (df = 176, $p < 0.001$), normed-$x^2 = 2.400$ NFI = 0.876, TLI = 0.908, CFI = 0.923, RMR = 0.058, RMSEA = 0.080 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6 Conclusion and Implications

The study discusses the issue of touristic experiences which have been emphasized in the environment of heritage tourism attractions where the use of smartphone applications has been increased. The findings of the study are summarized as follows. First, the types of presence induced by smartphone applications are categorized as object presence and social presence. Object presence did not show any significant effect on any tourism experience, while social presence had positive effects on entertainment and escape experiences. Second, touristic experiences of cultural attractions, excluding escape experience, through the utilization of smartphone applications, affected tourist satisfaction. Among tourists' experiences, educational experience and entertainment experience had positive effects on touristic satisfaction.

The findings of the study offer academic and practical applications. First, the study is innovative in that the relationship between the tourists and the concept of the presence induced by interactive smartphone-based tourism applications had been applied. These concepts have been rarely researched in the field of tourism. Second, it is noted that object presence had no significant effect on any touristic experience, while social presence affected entertainment and escape experience. In particular, the effect of social presence was the greatest on escape experience and on entertainment in the order. The findings correspond with the results from Kang and Gretzel (2012). They revealed, by examining tourists of national parks utilizing pot casts, that social presence induced by pot cast had impacts on escape experience and entertainment experience in the order. Third, when smartphone applications have been used in the heritage attractions, educational and entertainment experiences made significant effects on tourist satisfaction. The effect of entertainment experience on tourist satisfaction was the greatest, whilst educational experience made a positive effect on tourism satisfaction. The findings also support the previous studies which discusses the causal relations between touristic

experiences in heritage attractions (Light 1995; Han 2006). Light (1995) showed the differences in the impacts of interpretive medium of heritage attractions on interests and attention of tourists. That is, he demonstrated that tourists showed more enjoyment when audio medium has been applied, compared to when interpretation media, such as exhibitions and panels, have been used. In the case of smartphone applications, a number of entertainment functions (games, puzzle, foot printing, AR-based photo) included in the devices may enhance the edutainment experience of cultural resources which might be dull and difficult to deal with otherwise However, the study still holds some limitations. The study collected data, by using a convenient sampling method from the tourists who visited cultural heritage attractions that adopted smartphone to enhance the experience. Thus, the study findings may not be generalized to all smartphone tourism applications and users of smartphone applications. However, since the topic of smartphone applications to tourism is at the beginning stage, the study may contribute to the theoretical understanding on the acceptance of a new form of Information Communication and Technology (ICT).

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CT-Planner4: Toward a More User-Friendly Interactive Day-Tour Planner

Yohei Kurata and Tatsunori Hara

Abstract It is often difficult for novice people to make a tour plan for a tight schedule. Hence, we have developed a computer-aided tour planner, which enables the user to design a tour plan with the system in a collaborative manner. This paper introduces its latest version, *CT-Planner4*, which becomes accessible via Internet and is improved to achieve more user-friendliness. CT-Planner4 mainly targets foreigners and is expected to stimulate their hidden/unattended needs of plan consultation. Our two user tests with international students and foreigners living abroad, and another interviews with tourist advisors substantiates the practicality of CT-Planner4. Finally, we propose the application of its user log to marketing analysis.

Keywords Computer-aided tour planning · Personalization · Cold start problem · User evaluation

1 Introduction

Thanks to the widespread use of ICT in tourism, people can travel the world much more casually. On the other hand, it is still difficult for novice people to make a tour plan for a tight schedule, especially when they are visiting an unfamiliar area with various attractions. Of course, many people still enjoy tour planning, but at

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the same time some people feel anxious about it, wondering whether their plan is reasonable, without wasting time. In addition, when in a foreign country, it is not always easy to ask for somebody's advice.

In order to relieve people from such difficulty in tour planning, researchers have proposed several systems that can make personalized tour plans, (e.g., Ardissono et al. 2003; Goy and Magro 2004; Maruyama et al. 2004; Kramer et al. 2006; Lee et al. 2007; Castillo et al. 2008). However, many systems aim primarily at the automation of tour planning and, as a result, tended to exclude the user's participation in the process of planning (Seifert 2008). To overcome this problem, some systems introduced a customization phase, in which people can *modify* recommended plans (i.e., insert/remove/replace/reorder the POIs in the plans) (Garcia et al. 2010; Schaller 2011). Moreover, Kurata (2010) developed *CT-Planner*, which enables the user to design a tour plan with the system in a collaborative manner. CT-Planner stands for Collaborative Tour Planner, and also City Tour Planner as it mainly targets city-scale day trips. Its interaction model is similar to that of *critiquing*-based recommender systems (Linden et al. 1997; Chen and Pu 2009) in the sense that the users are required to gives certain feedbacks about the system's recommendations, but the users' feedback in CT-Planner is not evaluations of recommended plans, but additional requests which come up to the users' mind, inspired by those plans.

In this paper we introduce the latest version of CT-Planner, namely *CT-Planner4*. CT-Planner4 is a web-based application written in JavaScript and accessible from various devices (PCs, tablets, etc.) via Internet (http://ctplanner.jp), although special support for smartphones' tiny screen is not yet implemented. CT-Planner4 succeeds several essential features from its previous version: (1) collaborative planning (2) web-based accessibility, and (3) a genetic algorithm which allows high-speed plan calculation. In addition, to realize more user-friendliness, it newly achieves: (1) introduction of a hot-start mechanism, (2) improvement of user profile specification, and (3) support of open/close hours and walking preference. Through an overview of CT-Planner4 and its evaluation result, this paper demonstrates the practicality of computer-aided collaborative tour planning. Note that in this paper, tour plans refer to the plans that visit some of many POIs distributed in a city-scale area in a few hours or a day. This means that transportation to/from the destination and lodging in it are out of our scope.

The remainder of this paper is structured as follows: Sect. 2 reviews key ideas of computer-aided tour planning. Section 3 describes the user interface of CT-Planner4, while Sect. 4 explains the underlying mechanism. Sections 5 and 6 report the result of our user tests and that of our interview with experts, respectively. Finally, Sect. 7 concludes with a discussion of future work.

2 Issues of Computer-Aided Tour Planning

There are at least three major issues discussed in the previous studies of computer-aided tour planning: user profiling, POI evaluation, and user participation. User profiling is the process to obtain the user's data necessary for estimating the personalized value of POIs/plans. The obtained data is, for instance, his/her favourite POI categories (e.g., Kramer et al. 2006), tour purposes (e.g., Kurata 2010), and even demographic properties (e.g., Lee et al. 2007). Early recommender systems tended to force the user to input his/her profile manually at the beginning of use. Kurata (2000) criticized the difficulty of such manual input and proposed the use of AHP to deduce the user's preference from the answer to the questions comparing tour motivations. Similarly, Kurata (2010) used AHP to deduce the user's preference, asking him/her the preference over pairs of actual plans with different features. In Kurata (2011)'s user test, however, most users preferred manual input of preference when both options were available. This implies that the essential problem of user profiling is not manual input, but rather so-called *cold start*—the user is forced to spend long time to report his/her profile before getting recommendation. To prevent this problem, CT-Planner4 asks only two questions at the beginning and from the answer it roughly determines the initial value of user profile (Sect. 3).

POI evaluation is the process to estimate the personalized value of each POI. Previous systems adopted several techniques for this, such as matching of feature vectors (e.g., Lee et al. 2007; Kurata 2011), content-based matching using an ontology (e.g., Kramer et al. 2006), collaborative filtering (e.g., Castillo et al. 2008), and direct input by the user (Maruyama et al. 2004). In the process of POI evaluation, we should be careful about the context-dependency of POIs' value (Baltrunas et al. 2012; Kurata 2011)—the same tourist may give different evaluations to the same POI depending on his companion, weather, and season. Thus, it is desirable that the system allows the user to customize the POI evaluations in a certain way (e.g., accepting the request of must-see POIs).

User participation is a critical issue that many computer-aided tour planning systems have left behind (Seifert 2008). Lee et al. (2007) insists that the user-system interaction should be minimized in tour planning systems, but this claim is questionable. Kramer et al. (2006) insists that most people are not always aware of their preference and thus need to get reminded of it. We believe that many people cannot tell their preference/interest before seeing sample choices, especially when the target is not what they often buy, such as tourism products. CT-Planner (Kurata 2010), therefore, adopted a cyclic approach where the system proposes a sample plan, the user examines it and gives feedback, and then the system revises the plan accordingly. The merit of this approach is that the user is not forced to specify their request/interests all at once in the early stage of use. This approach is welcomed by its test users (Kurata 2011) and thus succeeded to CT-Planner4.

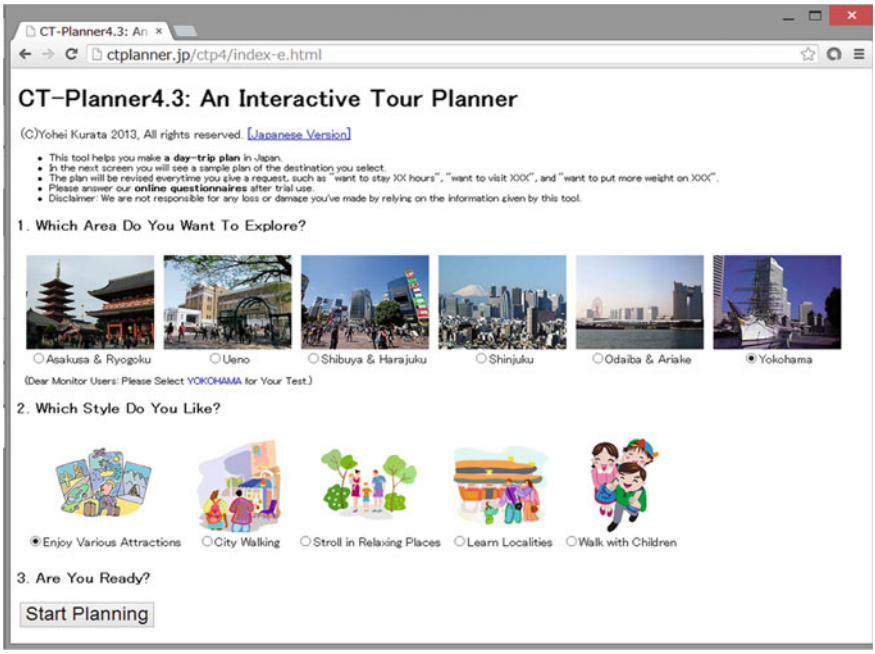

Fig. 1 Initial screen of CT-Planner4

3 User Interface of CT-Planner4

CT-Planner4 starts from the screen in Fig. 1. Here you are asked only two questions: your destination and favourite travel style. Currently we are listing six destinations in/near Tokyo and five travel styles: *Enjoy Various Attractions*, *City Walking*, *Stroll in Relaxing Places*, *Learn Localities*, *and Walk with Children*. These travel styles are derived from the result of a GPS-based activity survey on foreign tourists visiting Tokyo (Aratani et al. 2012).

If you select "*Yokohama*" and "*Walk with Children*", for example, you will see the main screen in Fig. 2. It shows the route of a sample tour plan on the central map, which strolls across the central Yokohama in 3 h. Its agenda is also shown on the right end of the screen. The map is illustrated with the aid of Google Maps API and accordingly, you can zoom/scroll the map and even see the corresponding satellite image to check the detail of the tour route.

The left end of the screen shows three items from the top: tour condition, user profile, and command bottoms. The tour condition consists of five items: *duration*, *start time*, *day of the week*, *walking speed*, and *reluctance to walk*. If you modify the tour condition, your plan is revised promptly. For instance, if you set the *start time* to 5:00 pm, your plan will skip most museums because they are already closed. Similarly, if you set *the reluctance to walk* to *yes*, the walking distance of

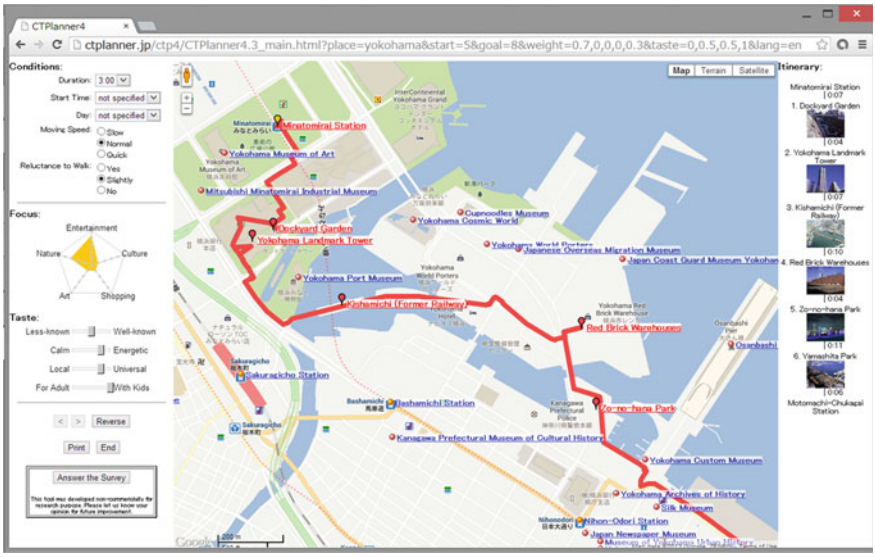

Fig. 2 Main screen of CT-Planner4

your plan will become shorter. The user profile consists of *focus* and *taste* parts, each represented by a five-axial radar chart and a set of four sliders. The values of your profile is pre-determined based on your initial selection of favourite travel styles, but they are adjustable if you want. For instance, if you put more weight on *culture* by clicking the right-upper part of the radar chart, your plan will visit more museums. If you slide the top slider to the right end (i.e., to *Well-known* side), your plan will visit famous POIs more likely.

If you click a POI's name on the map or the agenda, a small info-window appears at its location (Fig. 3). This window shows the POI's basic information (name, estimated value represented by 1- to 5-stars, description, estimated staying time, and hyperlinks to the related websites). The window also shows several buttons. Once you click *Visit* button, the system generates the plans which visit this POI as long as possible. Conversely, once you click *Avoid* button, the system no longer shows the plans that visit this POI. *Start*/*Goal* button allows you to set this POI as the start/goal location of your tour. Finally, *+10*/*−10* button allows you to adjust the staying time. Note that you can request POIs to visit/avoid, but the system does not force you to do so. In other words, you can let the system select other unrequested POIs to visit if you have time.

CT-Planner4 expects the following interaction cycle: (1) you look at a sample plan and POIs shown on the map, (2) you provide a certain response (specify a POI to visit/avoid, changes your tour condition, or modify your profile) and (3) the system revises the displayed plan accordingly and displays it. This cycle is repeated until you get satisfied with the plan. You can also use *undo*/*redo* commands. After finishing, you can print out your plan and bring it to your destination.

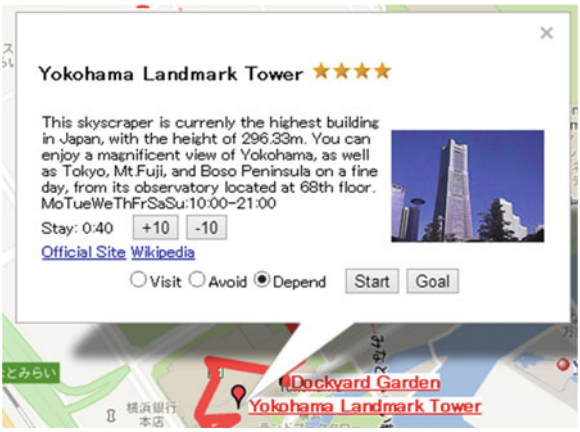

Fig. 3 An example of a POI's info-window

4 Underlying Mechanisms

4.1 Deriving the Best Plan

The problem to find out the best tour plan under given constraints can be formalized as follows (Kurata 2010):

Given a complete graph (V, E)*, the expected utility of each node* u_i *the visitation time* t_i^{visit} *the travel time* t_{ij}^{travel}*, origin node* $v_{ori} \in V$*, goal node* $v_{goal} \in V$ *and time constraint T, find a series of nodes to be visited* $v_{a_1}, \cdots, v_{a_k}$ $(v_{a_i} \in V)$ *that maximizes the sum of utilities* $\sum_{i=1}^{k} u_{a_i}$ *under the following three constraints:*

$$\sum_{i=1}^{k} t_{a_i}^{visit} + \sum_{i=0}^{k+1} t_{a_i a_j}^{travel} \leq T \; v_{a_0} = v_{ori} \; v_{a_{k+1}} = v_{des}$$

This problem is essentially Selective Traveling Salesman Problem (STSP), which is proved to be NP-hard (Laporte and Martello 1990). Thus, to compute semi-optimal solutions of this problem, CT-Planner 4 uses the following genetic algorithm:

Step1. **Initialization**: We generate n initial plans, which starts at the given start location, visits an appropriate number of randomly-selected POIs, and ends at the given goal location.

Step2. **Evolution**: The following process is repeated N times:
Crossover: We select two plans P_A and P_B, randomly from the n existent plans, and create their hybrid plan (i.e., the plan that combines the random length of P_A's fast part and that of P_B's last part and then removes redundancy of POIs). This is repeated cn times (c: crossover rate). As a result, we have $(1 + c)n$ plans.

Mutation: We select a plan P_C from the $(1 + c)n$ existent plans and replace a POI visited in P_C by another randomly-selected POI. This is repeated $(1 + c)mn$ times (m: mutation rate).

Survival Competition: We select two plans randomly from the $(1 + c)n$ existent plans and remove the one with a lower score. This is repeated cn times.

Step3. **Selection of the best plan**: From the n existent plans, we select the one with the highest utility score.

This algorithm has four parameters: number of generations N, number of surviving plans in each generation n, crossover rate c, and mutation rate m. As N and n increase, the solution becomes better, but the computation time increases. We tuned up the parameters such that the computation usually finishes within a second. For powerless devices, CT-Planner4 has another option with which the above computation is conducted on our server.

The above algorithm allows us to handle POIs' closing days/hours, simply by reducing the score of *violating* plans (i.e., the plans that require to visit a POI during its closing hours/days) to zero. In a similar way, the above algorithm will allow us to handle various extensions, such as POIs' time-dependent values, budget limitation, and reciprocal effects of POIs (Sect. 4.2), although they are not implemented yet.

4.2 Evaluating Plans

In the above algorithm, we have to score the plans for comparison. Basically, a plan's score is calculated as the total of the *expected utility* of POIs to be visited in this plan. Then, certain penalty is imposed on the score when the plan requires long-distance walk, depending on the user's setting on *reluctance to walk* (Fig. 2).

This scoring method may have a room for improvement, because in reality the plan's value may be affected by the order of POIs. For instance, people may prefer the plan that visits the highlight POI at the end rather than at the beginning. In addition, we should also consider reciprocal effects—if people visit similar POIs repeatedly, they may get bored, or conversely, they may get more understanding and satisfaction. Ideally, tour plans should be designed carefully, like fabricating a story, imagining the temporal transitions of tourists' emotions. How to realize such tour design in computers is left as a future question.

4.3 Evaluating POIs

The expected utility of a POI is estimated based on the vector matching of the POI's characteristics and the user's profile (Kurata 2010). The POI's characteristics are evaluated in advance by the data author (Sect. 4.4), while the user's profile is determined at the time of use (Sect. 3).

CT-Planner4 supports two types of user profile: *focus* and *taste*. *Focus* refers to the tour's functional feature demanded by the user. It is represented by the assignment of weight to the five categories: *culture*, *entertainment*, *nature*, *art*, and *shopping*. *Taste* refers to the tour's emotional characteristics demanded by the user. We considered four types of taste, each represented by its two poles; *less-known* or *well-known*, *calm* or *energetic*, *local* or *universal*, *for adult* or *with kids*. Taste is newly added in this version to enrich the representation of user preference. We expect that the taste is relatively stable and consistent, while the focus often changes depending on the destination and context.

Each POI is evaluated from the nine criteria corresponding to the parameters of focus and taste. For instance, a typical zoological park has high scores for *entertainment* and *nature*, and it is positioned at *energetic*, *universal*, and *with kids* sides, respectively. In order to assure the reliability of such evaluation, a scoring manual was prepared.

Note that the estimated utility of some POIs may be replaced internally for the computation of tour plans. For instance, when you request to visit a POI p_x, very high utility is assigned to p_x, such that CT-Planner4 generates the plans that visit p_x as long as the time constraint allows. Conversely, when you request to avoid a POI p_y, its utility is set zero, such that the generated plans do not visit p_y.

4.4 Authoring Destination Data

We made an Excel-based data editor, with which people can easily make a destination data for CT-Planner4. In future, we will ask volunteers to author destination data, in order to expand the destinations that CT-Planner supports. In our editor, the user is asked to input in a table the basic data of each POI, including its evaluation and geo-coordinates. Then, in order to save the user's task, the editor automatically derives all inter-POI routes by walk with the aid of Google Directions API and records them in json format. Pre-computation of inter-POI routes is highly effective for the reduction of computation time in use (Joest and Stille 2002), and also necessary to overcome the API's access limit per day.

5 Evaluation by Test Users

In order to evaluate CT-Planner4's practicality, we conducted two user test, one with international students and another with foreigners living abroad, because we wanted to examine whether our tool was useful for both people who were already in/near the destination (*on-destination users*) and those who were at home (*off-destination users*). The reason for targeting foreigners is that they tend to feel difficulty in tour planning due to language barrier and lack of geographical knowledge. As the first step of our test we employed international students instead of actual travellers because we could easily control their travel schedule.

The test with on-destination users was conducted on March, 2013. We advertised on a student mail magazine and employed 16 international students from 8 countries. We assembled them to Yokohama, a popular destination near Tokyo. At a meeting room, they were asked to make their tour plan with CT-Planner4 and then to answer a questionnaire. After that, they went sightseeing for 6 h. After returning, we asked them to answer another questionnaire and conducted a short interview.

The test with off-destination users was conducted on August, 2013. We employed 56 English-speaking test users from 28 countries, introduced by an investigation firm. We asked them to use CT-Planner4 on their PCs for at least 5 min and then to answer an online questionnaire. They were not given any instruction about how to use CT-Planner4, so that we can examine the intuitiveness of the system.

5.1 Satisfaction and Impression

The participants of both tests were asked their satisfaction with and impression of CT-Planner4 (Table 1). Most users evaluated CT-Planner4 positively. Its easiness was evaluated even by off-destination users who have no instructions (Q2). The use of CT-Planner4 gives a positive effect, although not dramatic, on their expectation (Q4). In addition, most users agreed the system's positive effect on learning destinations (Q5-6). Unfortunately, on-destination users show a bit lower satisfaction (Q1). This is probably because at the time of their test, *undo* and *reverse* functions was not implemented yet and some users strongly requested them.

We investigated the relations between overall satisfaction (Q1) and such personal features as travelling days per year, experience to visit Japan, interest in Japan, and self-evaluation of map reading skill, but no clear relation was found. In addition, the unsatisfied users did not have any remarkable features in their profile.

On-destination users were also asked to evaluate CT-Planner4 after their six-hour tour (Q7-8). Q7 (usefulness of tour plans) is agreed by most users, but interestingly, Q8 (usefulness of tour planning experience) gets more agreement. Indeed, some users reported in the interview that they could flexibly reschedule their plan during their tour thanks to their planning experience. This indicates a unique aspect of CT-Planner4 as an educational tool for tourists.

5.2 Demand by Situations

We proposed six situations where CT-Planner4 can be used, and asked the test users the level of their demand on CT-Planner4 in each situation. We found that CT-Planner4 is welcomed in most situations except the earliest phase (S1). This

Table 1 Satisfaction and impression by users (average scores in five-grade scale)

Question	On-destination users	Off-destination users
Q1 How *satisfied* are you with CT-Planner4 overall? (5: very satisfied—1: very dissatisfied)	3.81	3.96
Q2 Was it *easy* to use? (5: very easy—1: very hard)	4.13	3.96
Q3 Were you able to draw up a travel plan *to your taste*? (5: strongly agree—1: strongly disagree)	4.00	3.93
Q4 Did use of this tool heighten your *expectations* of sightseeing in Yokohama/Japan? (5: very much—1: lowered very much)	3.73	3.88
Q5 Do you feel *clearer* than before what you'd like to do at the destination? (5: strongly agree—1: strongly disagree)	3.94	3.89
Q6 Did use of this tool hep you notice tourist spots which you would not consider in your usual planning? (5: very much—1: not at all)	4.19	4.13
Q7 Was the *tour plan* you made with CT-Planner4 useful for your trip? (5: strongly agree—1: strongly disagree)	4.19	–
Q8 Was your *experience* of computer-aided tour planning *useful* for your trip? (5: strongly agree—1: strongly disagree)	4.38	–

means that people start to want CT-Planner4 after deciding their destination. Thus, the availability of CT-Planner4's service may not give high impact on the selection of destinations. Interestingly, on-destination users had lower demand for on-site mobile use (S6). Some users said that they had no time to consult on their trip plan once they started travelling. Another finding is that in most situations (S1-5) on-destination users had higher demand than off-destination users. This may indicate that the actual practice of tour plans made with CT-Planner4 increases their evaluation of it (Table 2).

5.3 Comparison with Usual Planning

We asked the off-destination users to compare tour planning with CT-Planner4 and their usual planning (i.e., the planning style they normally use, maybe manual or computer-aided). The result shows that the highest strength of CT-Planner4 is its time-saving capability, followed by plan's novelty and reliability (Table 3). On the other hand, the plan's quality is not highly evaluated. Actually, 30 % of the test users answered that their usual planning is superior to CT-Planner4 with regard to plan's quality. This implies that there is still room for improvement in our current plan generation method.

Table 2 How much people want to use CT-Planner4 in each situation (average scores in five-grad scale, where 5: very much—1: not at all)

Situation	On-destination users	Off-destination users
S1 At home, when selecting a destination from several candidates	3.81	3.61
S2 At home, when planning activities at the selected destination	4.50	3.80
S3 In the hotel at the destination, on the previous night of strolling	4.50	3.80
S4 On board a transportation medium headed for the destination	4.06	3.96
S5 From a device at a local tourist-information agency	4.13	3.75
S6 While strolling around the city (using a mobile device)	3.88	4.07

Table 3 Evaluation of CT-Planner4 in comparison with usual tour planning (+2: Planning with CT-Planner is much better——2: Usual planning is much better)

Criteria	Off-destination users
Plan's quality	+0.14
Plan's reliability	+0.65
Plan's novelty	+0.79
Time spent to make plans	+1.09

5.4 User Requests

We asked the off-destination users to write any request to CT-Planner4. The popular requests were (1) to display more information and/or pictures about POIs, (2) to provide a user instruction, and (3) to add restaurant/café/food information. In addition, we got several useful requests, such as (1) to simplify the map with icons with automatic pop-ups, (2) to show other user's comments on POIs (possibly using an outer service like Trip Advisor), and (3) to consider weather forecast for planning.

The request for restaurant/café/food information is also often heard in the interviews with the on-destination users. CT-Planner4 did not support restaurants/cafés yet, because the current method required us to pre-compute the routes between all pairs of POIs (Sect. 4.4) and thus it is difficult to add a number of restaurants/cafés to the POIs. However, as food is an important content of tourism, we are seeking an alternative technique which can treat restaurants/cafés differently from other POIs. Some users proposed the use of public transportation during tours. Actually, we can derive the routes using public transportation making use of Google Maps API. However, it often shows the route that uses local low-frequent buses, which is probably difficult for novice tourists and thus, the current version did not consider the use of public transportation. In future, we are going to calculate inter-POI routes by different transportation modes, and we may adopt the one by public transportation if it is found much time-saving, high-frequent, and easy for novice tourists.

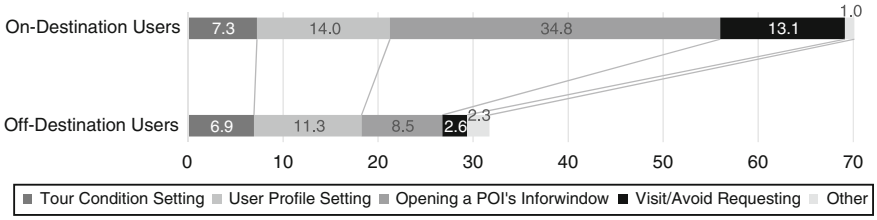

Fig. 4 Frequency of commands gave by test users

5.5 Analysis of User Log

CT-Planner4 records the user's commands and the resulting plans, and uploads them to our server if possible. Through the above two tests, we obtained eight complete logs by on-destination users and thirty-five by off-destination users. These logs show that on average the on- and off-destination users have spent 20 min 50 s and 6 min 42 s on CT-Planner4, respectively. The on-destination users spent much longer time because they carefully designed their plan for their immediate use, while the off-destination users simply tried this tool to see what they can do with it. Figure 4 shows the detail of the users' commands. On average the on- and off-destination users gave 70.1 and 31.6 commands, respectively. The difference arises mainly from the frequency of opening POI info-windows and the following visit/avoid request. This is, again, because the on-destination users carefully designed their plan for that day. Interestingly, the numbers of commands gave by both user groups for the setting of tour condition setting and for that of user profile are almost the same.

Our more detailed analysis revealed the following typical pattern of the use of CT-Planner4: (1) at the beginning phase the user often use the commands for setting tour conditions and user profile, (2) in the middle phase the user often open POIs' info-windows and give visit/avoid requests and (3) at the last phase the commands are used less frequently, but some users experimentally re-adjust their profile to see what happens then.

6 Evaluation by Experts

In addition to the two user tests in Sect. 5, we had an interview with four staffs at Yokohama's tourist information office on July, 2013. All of them welcomed CT-Planner4, saying that it would support unattended or hidden consultation needs. They regretted that many tourists stayed their office only for a short time, often without asking any question, especially when the staffs looked busy. In addition, they said that the staffs could attend only visitors who came to the office on their office hours, while tourists often had consultation needs in the previous

night of sightseeing. As for the plan's quality, they said that CT-Planner4 apparently generated reasonable plans, although it would be much better if it supports the use of subways and *Akai Kutsu Buses* (bus service specialized for tourists).

One of the staffs pointed out that CT-Planner4 would be very useful when they were asked about *other* cities. They have abundant and up-to-date knowledge about Yokohama, but not so much about other cities, such as Tokyo and Kyoto, whereas tourists' questions often go beyond their speciality. Another staff suggested to provide CT-Planner4 to taxi drivers and hotel staffs, who often got questions from foreign tourists but had not received any special training for advising them. Those ideas are worth considering when promoting CT-Planner4 to the business world.

7 Conclusions and Future Work

This paper reported the latest version of our computer-aided tour planner, CT-Planner4. Our goal is to provide tour planning aids to novice tourists via the Web. With CT-Planner, people can consult on their tour plan from anywhere at any time, as much as they want, without worrying about asking people in foreign languages. Its practicality is substantiated by the result of our user tests and expert interview. In addition, we observed that CT-Planner4 stimulated its users' expectation to the destination. We hope that in future CT-Planner4 will contribute to its destinations by bringing more tourists to there.

Although we have not explicitly claimed, we have another future goal—to collect a large volume of user log data and make use of it for marketing analysis. The user log of tour planning service is an invaluable source to know users' travel needs and preferences (Not and Venturini 2011). For instance, our user log shows that *Yamashita Park* and *Red Brick Warehouse* are popular for both on- and off-destination users (i.e., most of their plans visit these two POIs), but *Chinatown* is popular only for on-destination users. As the number of users increase, we can derive more reliable insights, as well as we can analyse the difference of tourist groups (e.g., Asians and Europeans), without paying a survey cost. We expect that such findings will help destination management offices to consider their promotion strategies, as well as travel agencies to improve their package tours (Hara et al. 2012).

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Context-Aware Points of Interest Suggestion with Dynamic Weather Data Management

Matthias Braunhofer, Mehdi Elahi, Francesco Ricci and Thomas Schievenin

Abstract Weather plays an important role in tourists' decision-making and, for instance, some places or activities must not be even suggested under dangerous weather conditions. In this paper we present a context-aware recommender system, named STS, that computes recommendations suited for the weather conditions at the recommended places of interest (POI) by exploiting a novel model-based context-aware recommendation technique. In a live user study we have compared the performance of the system with a variant that does not exploit weather data when generating recommendations. The results of our experiment have shown that the proposed approach obtains a higher perceived recommendation quality and choice satisfaction.

Keywords Context aware · Weather · Recommender systems

1 Introduction

The decision to purchase a tourism product or to visit a place of interest (POI) is the outcome of a complex decision process. Several factors affect tourist's decision, some are "internal" to the tourist, such as personal motivators or past experience, others are "external", e.g., advices or recommendations, information about the

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product, or the climate of the destination (Swarbrooke and Horner 2007). In particular, climate and weather are important factors in tourists' decision making and also influence the successful operation of tourism businesses (Becken 2010). While tourists might easily predict general climatic conditions, when they travel to a place they will experience the actual weather, which may range among (very) different conditions. For instance, considering the climate factor, it is easy to recognize that Rimini's beach is much less appealing in winter than in summer, but without knowing the weather conditions a hike on the Dolomites Mountains in summer is hard to miss if the user does not know that a storm is approaching the area.

In this paper we focus on systems and techniques that can better predict tourist's ratings for places of interest, and mobile systems that exploit these predictions in compiling and presenting more appropriate recommendations to tourists. We target this goal by taking into account within the system recommendation model the impact of the weather conditions at a specific place of interest on the (predicted) tourist evaluation for the place. We will show that the knowledge of the weather conditions at a POI, together with past observations of how tourists rated their visited places under several alternative weather conditions may be effectively used to improve the choice satisfaction and perceived recommendation quality of a mobile place of interest recommender system (Ricci 2011).

This research fits into a fast growing research topic for recommender systems (RS), i.e., context-aware systems (Adomavicius et al. 2011; Lamsfus et al. 2013). Context-aware recommender systems (CARS) generate more relevant recommendations by adapting them to the specific contextual situation of the user. While the user location and the environment conditions around the user have been often used in (mobile) context-aware recommender system (Ricci 2011; Schwinger et al. 2005), the weather conditions that the user will experience at a place of interest have never been systematically exploited in the prediction models of recommender systems. The main difficulty in managing this type of contextual data is that it is not linked to the user state, but depends on the place (item to be recommended) and dynamically varies in time. Moreover, in order to effectively use this type of information the system must be able to *predict* the weather conditions when the user will visit the place and not simply access these values at the recommendation time. This means that weather predictions data must be obtained and correctly exploited into the prediction model.

In this paper we will illustrate the modelling elements of a mobile, context-aware recommender system STS (South Tyrol Suggests) that recommends places of interest in South Tyrol (Italy) by taking into account weather predictions for the places and a matrix factorization model extended with a range of parameters which model the interaction between a set of relevant contextual dimensions and the item ratings (Baltrunas et al. 2012). The tourist's preference model is learned using a collection of ratings for POIs that the system actively requests to the users before providing recommendations. We have evaluated the proposed system in a live user study by comparing it to a variant (STS-S) that uses exactly the same prediction model and contextual factors with the exclusion of the weather factors. We have

found that the exploitation of the weather data can improve the choice satisfaction and perceived decision quality, hence showing the usefulness of the proposed methods.

2 State of the Art

Context-aware recommender systems (CARS) is a relatively new field of research but already a number of context-aware rating prediction techniques have been proposed (Adomavicius et al. 2011). Recent research works have focused on model-based techniques that integrate contextualization directly into the rating prediction models, which is the core component of a RS. Applying such techniques, CARS can generate recommendations on the base of a collection of ratings were also the contextual factors, which may have influenced the user experience of the rated item, are specified. For instance, a CARS may record that a user rated five stars a particular attraction (e.g., a museum) after having visited it with his girlfriend in a cold winter day (contextual factors). In this paper we have extended the model originally introduced in (Baltrunas et al. 2011) by incorporating new contextual factors describing the weather conditions and some new user attributes.

In fact, while a considerable number of research works have been conducted on CARS, the majority of them have not taken into account one of the most relevant contextual factors, i.e., climate and weather conditions. Several studies have shown that weather condition is a significant factor in tourists' satisfaction, activity participation, and even in perceived safety at touristic place. Hence, it can strongly influence tourists' destination choice (Becken 2010). Weather condition acts either as a main factor in tourism activities (Kozak et al. 2008) or as a facilitator that makes such activities more pleasant to the tourists (Gómez Martin 2005). Accordingly, it plays a key role in the national and global tourist flows (Becken 2010). A study has shown that more than 70 % of the German tourists, who have been interviewed, searched and obtained information on the weather conditions of their holiday destinations (Hamilton et al. 2005).

Moreover, mobile phones are a main platform for information acquisition and more and more people are using these information and communication devices especially for tourism applications. Device portability makes it easy for tourists to access information in a touristic destination and helps them to find relevant attractions and services, or to support them in the exploration of an area (Ricci 2011; Schwinger et al. 2005).

Mobile CARS can largely benefit from the exploitation of information relative to the users' current context. An example of mobile CARS is *liveCities* presented in (Martin et al. 2011). This system supports tourists by sending them push-based notifications when they enter a certain area and their context matches pre-defined conditions. Such virtual areas with context conditions are created by registered tourism entities and linked with notifications. Such notifications may include the description of nearby POIs, a suggestion about what to do, or an offer, such as a

discount given by a nearby restaurant. It is worth nothing that this system is rather difficult to compare with ours. First of all, our system takes into consideration the weather forecast as well as temperature while their system uses only the temperature. Moreover, they use predefined recommendations for the users while we use a predictive model to generate them. Lastly, their system recommends only restaurants while we recommend several types of attractions (events, attractions, accommodation, restaurants and activities).

In Wang and Xiang (2012) the authors made a comprehensive analysis of the mobile apps in the travel category of iTunes that have received the largest number of reviews and ratings. They have categorized the 300 top apps according to the unique information services they provide and their design features. Although, several apps provide recommendations using techniques such as collaborative filtering with context awareness, none of them is reported as using weather condition as a contextual factor; this stresses the novelty of our contribution.

Finally, in a recent short paper (Meehan et al. 2013) it is presented a work in progress relying on the usage of several contextual factors, including weather information, in a hybrid mobile recommender system that supports tourist's decision-making process. Even though this system shares some of our goal it was not implemented and therefore it cannot be compare with our system.

3 Usage Scenario

This section describes a typical system-user interaction with the implemented places of interest (POIs) context-aware mobile recommender system, named STS. Let us assume that a tourist or a citizen is looking for a POI near to Bolzano. The first time STS is run it presents to the user the registration screen where she can specify a username, her birthdate and gender. Next, the user is asked to answer the Ten-Item Personality Inventory (10-items TIPI) questionnaire (Gosling et al. 2003) so that the system can assess her Big Five personality characteristics (i.e., conscientiousness, agreeableness, extroversion, emotional stability and openness) (see Fig. 1, left and middle). Using the provided birthdate, gender and the assessed personality as input, the system, which implements an active learning component (Elahi et al. 2013), identifies and prompts the user to rate a series of POIs whose ratings are expected to improve the accuracy of the subsequent recommendations (see Fig. 1, right). It is worth noting that the requested ratings must be entered by specifying also the context in which the POI was visited; in the considered example the temperature, crowdedness and companion factors should be specified by the user.

Now the system can provide recommendations as illustrated in Fig. 2 (left). By default, this window provides the tourist with a list of 20 POIs that are considered appropriate for the current context of the recommendation request. We note that some contextual conditions are automatically acquired (e.g., weather conditions), while others can be specified by the user using a system screen (Fig. 2, middle).

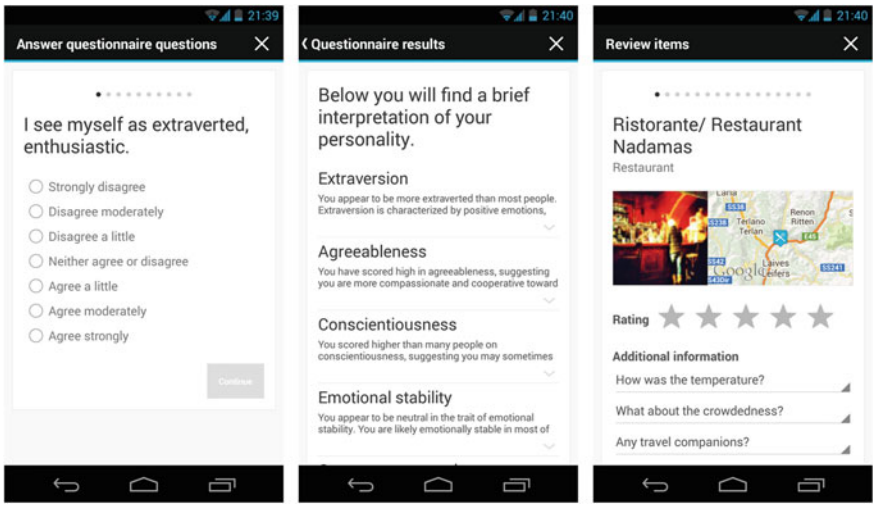

Fig. 1 Preference elicitation

In the event that one of the items is of interest, the user can view its details by clicking on it. In this scenario, the tourist chooses the Dolomites hiking tour as her desired item. Then, the system visualizes a screen with the details of the item, as shown in Fig. 2 (right). This window provides various information about the item, such as a photo, its name, a description, its category and more importantly an explanation of the recommendation based on the most influential contextual condition. For instance, in the example "sunny weather" is mentioned as a good motivation for the visit. Other supported features include, among others, the ability to view a POI on the map (Fig. 3, left), to write reviews for them (Fig. 3, middle) and to bookmark them.

Bookmarking an item will then allow the user to retrieve the selected POI from the Bookmarked items screen and to be notified when the recommendation for this item becomes inappropriate due to the weather change at the item's location (see Fig. 3, right). For instance, in our scenario, the next day the weather changes from sunny to rainy. Under this new contextual condition the item is expected to be less suited. Consequently, the tourist is alerted by the system so that she can revise her choice.

4 Weather-Aware Recommendations

STS has been implemented as a rich client, always-on architecture, i.e., the client has been kept as thin as possible and it works only in a limited way offline. The Android client comprises a GUI and a presentation logic component; the entire recommendation logic and data layer reside on the server, which makes use of web services or data storages provided by the Regional Association of South Tyrol's

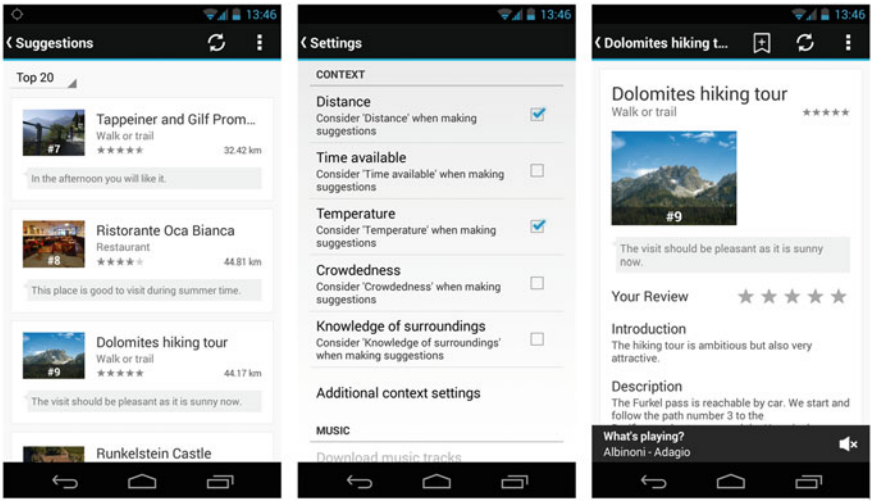

Fig. 2 Context-aware suggestions

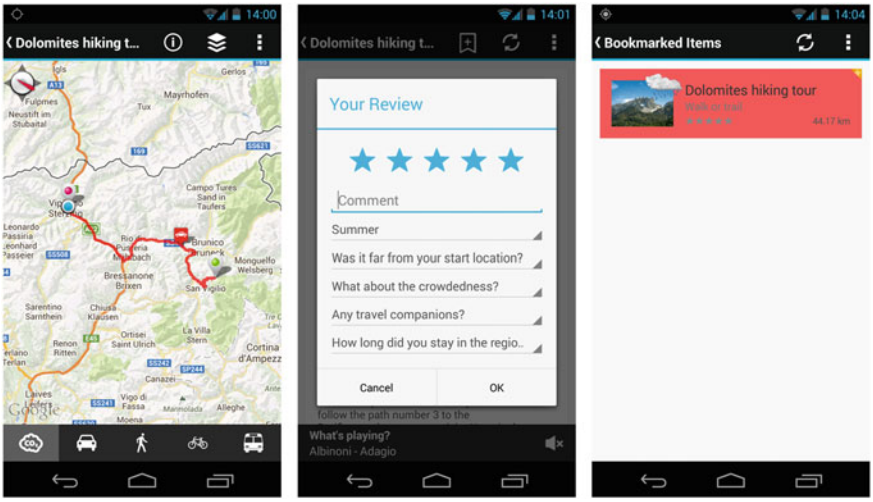

Fig. 3 Additional system functionalities

Tourism Organizations (LTS[1]), the Municipality of Bolzano[2] and Mondometeo[3] in order to obtain the graphical/textual descriptions as well as weather forecast information for a total of 27,000 POIs.

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

[2] Municipality of Bolzano: http://www.comune.bolzano.it

[3] Mondometeo: http://www.mondometeo.org

Table 1 Used context factors

Contextual factors and associated contextual conditions
Weather
Sunny, cloudy, rainy, thunderstorm, clear sky, snowing
Temperature
Burning, hot, warm, cool, cold, freezing
Distance
Far away, near by
Time available
Half day, one day, more than one day
Crowdedness
Crowded, not crowded, empty
Knowledge of surroundings
New to area, returning visitor, citizen of the area
Season
Spring, summer, autumn, winter
Budget
Price for quality, budget traveller, high spender
Daytime
Morning, afternoon, night
Companion
With friends/colleagues, with children, alone, with girlfriend/boyfriend, with family
Mood
Happy, sad, active, lazy
Weekday
Working day, weekend
Travel goal
Business, health care, scenic/landscape, hedonistic/fun, religion, visiting friends, education, activity/sport, social event
Transport
A car, a bicycle, public transport, no transportation means

The recommendation algorithm of STS computes a rating prediction for all POIs in the database, while assuming that the current or predicted user/item context holds. The user/item context is partially specified by the user through the STS Android client and partially acquired automatically by the system, as it was mentioned in the previous section. More information about the used contextual factors and their contextual conditions can be obtained from Table 1. We have used the contextual factors that were identified in (Baltrunas et al. 2012) where they were selected among a larger number of factors, as being the most relevant and influential ones. Finally, the N highest scoring POIs are included in the recommendation list (20 in our case).

In order to generate recommendations in real-time, STS underlying recommendation algorithm follows a model-based approach and has been logically divided into two asynchronous phases: the learning phase and the recommendation phase.

The learning phase is performed offline, in our case, once every 5 min. After the model is learned, recommendations can be quickly computed (i.e., in constant time).

4.1 Prediction Model

The implemented rating prediction model extends and adapts that proposed by (Baltrunas et al. 2012). It is a context-aware matrix factorization approach that incorporates baseline parameters for each contextual condition and item pair, besides the traditional matrix factorization components (i.e., global average, item bias, user bias, and user-item interaction). These baselines are additional model parameters that, for each contextual condition and item pair, measure the deviation of the rating for an item produced by the contextual conditions. For instance, if an item i tends to obtain higher ratings when the contextual condition c holds than when c doesn't hold, then the baseline for this particular contextual condition and item pair is a positive number. Similarly, if the presence of c leads to lower ratings for i, then the baseline for c and i is a negative number. The introduction of additional parameters, one for each contextual condition and item pair, slightly increases the complexity of the model, however, it improves its accuracy since the model is able to capture the dependency of the ratings from the context (Baltrunas et al. 2011).

We have used that approach as a starting point, and we have incorporated additional user attributes (i.e., gender, birth date and personality trait information). Analogously to the extended matrix factorization models described in (Koren et al. 2009), we propose to use a distinct factor vector $y_a \in R^f$ for each attribute in the set of user-associated attributes $A(u)$ in order to describe the user:

$$\sum_{a \in A(u)} y_a \tag{1}$$

The matrix factorization model is then as follows:

$$\hat{r}_{uic_1,\ldots,c_k} = \bar{i} + b_u + \sum_{j=1}^{k} b_{ic_j} + q_i^T \left(p_u + \sum_{a \in A(u)} y_a \right), \tag{2}$$

where q_i, p_u and y_a are f dimensional real-valued vectors representing the user u, the item i and the user attribute a, respectively. $\bar{i}$ is the average rating for item i, b_u is the baseline parameter for user u, b_{icj} is the baseline for the contextual condition c_j and item i, and $\hat{r}_{uic_1,\ldots,c_k}$ is the predicted rating of user u for item i in the context specified by the conditions $c_1,\ldots, c_k$ (assuming that k factors are considered). This model, improving the model proposed in (Baltrunas et al. 2012) and other standard collaborative filtering approaches, allows to produce personalized recommendations based on the aforementioned user attributes, even if the target user hasn't rated any items yet.

4.2 Training Phase

To learn the various model parameters, we minimize the regularized square error on the set of known ratings K (i.e., training set):

$$\min_{b*,q*,p*,y*} \sum_{(u,i,c_1,\ldots,c_k)\in K} \left[\left(r_{uic_1,\ldots,c_k} - \bar{i} - b_u - \sum_{j=1}^{k} b_{ic_j} - q_i^T \left(p_u + \sum_{a\in A(u)} y_a \right) \right)^2 + \lambda \left(b_u^2 + \sum_{j=1}^{k} b_{ic_j}^2 + \|q_i^2\| + \|p_u^2\| + \sum_{a\in A(u)} \|y_a\|^2 \right) \right] \tag{3}$$

Here, λ is the regularization parameter that is used in order to avoid overfitting the observed data. To minimize this equation, we have used standard stochastic gradient descent optimization.

4.3 Recommendation Phase

Once the prediction model has been trained, it can generate recommendations by predicting the active user's rating for each item in the database while taking into account the current or predicted contextual conditions of each item. In order to generate weather-dependent item recommendations, it is necessary to provide the actual or predicted weather and temperature values (for each POI in the data set) as input to the recommendation algorithm. More specifically, the recommendation phase works as follows:

1. The system retrieves the context values for the weather and temperature for the 116 municipalities of South Tyrol by querying the Mondometeo web service.[4] To improve performance, this information is locally cached on the STS server for 15 min.
2. For each item in the database, the system: (a) looks up the item's location; (b) assigns the weather and temperature values retrieved for the closest municipality to the item; (c) computes a rating prediction, considering the weather and temperature conditions along with other known contextual conditions as input parameters.
3. Finally, the 20 items with the highest predicted ratings are presented to the user as recommendations.

[4] Mondometeo web service: http://www.mondometeo.org

5 Evaluation

Recommender systems can be evaluated offline or online (Shani and Gunawardana 2011). After having fine-tuned the models in an offline stage (not described here for lack of space) we conducted a live user study aimed at measuring the user perceived recommendation quality and choice satisfaction. We compared STS with a simplified version, which does not make use of the weather contextual factors, which is called STS-S. STS-S has a pretty similar interface only lacking the weather related features (weather factors are not mentioned and the prediction model is not using this data). *We hypothesized that STS will improve the choice satisfaction and the perceived recommendation quality of STS-S.*

5.1 Experimental Methodology

In order to prove our research hypothesis, we have designed a specific user task and reused a questionnaire for assessing the perceived recommendation quality and choice satisfaction (Knijnenburg et al. 2012). Moreover, we added a specific question to measure the influence of the weather conditions (see below). 54 subjects (students, colleagues, working partners and sportspeople), aged between 18 and 35 participated to this experiment, which was conducted in their study or working place. They were randomly divided in two equal groups assigned to STS and STS-S (27 each). They tried and tested the system on a Nexus One mobile phone. We note that, as it is shown below, this sample size was sufficient to prove, with statistical significance, our research hypothesis.

The users were invited to imagine that they had an afternoon off, to look for attractions or events in South Tyrol, to consider which contextual conditions were relevant for them and to specify them in the system settings (see Fig. 2). Then they were invited to browse the attractions and events sections and check whether they could find something interesting for them. Afterwards, they were invited to browse the system suggestions (recommendations), select the one that they believed fitted their needs and wants and bookmark it. Finally, the users filled up a survey (Knijnenburg et al. 2012), which contains the following statements:

Perceived recommendation quality. Q1: I liked the items suggested by the system. Q2: The suggested items fitted my preference. Q3: The suggested items were well-chosen. Q4: The suggested items were relevant. Q5: The system suggested too many bad items. Q6: I didn't like any of the suggested items. Q7: The items I selected were "the best among the worst".

Choice satisfaction. Q8: I like the item I've chosen. Q9: I was excited about my chosen item. Q10: I enjoyed watching my chosen item. Q11: The items I watched were a waste of my time. Q12: The chosen item fit my preference.

Table 2 Perceived recommendation quality and choice satisfaction

	Perceived recommendation quality							Choice satisfaction				
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
STS-S mean	3.7	3.4	3.3	3.2	2.7	3.3	2.8	4.3	3.7	3.9	3.5	4.0
STS mean	4.0	3.4	3.5	3.7	2.9	3.8	3.1	4.6	4.0	3.7	3.5	3.9
p value	0.20	0.56	0.13	**0.04**	0.14	**0.00**	0.20	**0.02**	**0.03**	0.79	0.42	0.71

After this initial interaction, we wanted to assess whether an explicit reference to the weather conditions at the selected item may push the user to change her selected POI. Hence, we offered to the user the opportunity to double check the weather conditions at the selected POI by accessing on a computer the Mondometeo website. This was offered to the users in both groups. Afterwards, we asked the users whether they wanted to change their preferred POI and bookmark another one, i.e., if they believed that, because of the weather conditions at the selected POI, their previous choice was not anymore considered to be appropriate. The users that changed the preferred POI answered the following two questions: Q14: I like the new item I've chosen. Q15: Please say again whether the suggested items were well chosen.

5.2 Results

The first result of our user study addresses the number of unsatisfied users, i.e., those that have changed their preferred POI. Almost 60 % of the users (16 users out of 27) who have used STS-S have changed their selection after the assessment of the weather conditions, while only 30 % of the STS users (8 users out of 27) changed their selection. We have obtained p value equal to 0.028 for the Chi square test of independence. This indicates that the usage of the weather conditions in STS has a significant effect on the number of unsatisfied users.

In addition, as mentioned before, the users that have changed their selected POI were asked to answer two extra questions, i.e., Q14 and Q15. The result shows that, while the answers of Q14 were almost the same for both systems, there is a significant difference between the answers given to the Q15 by the users in two systems (p value = 0.01). This means that the users of the STS-S system have expressed significantly lower satisfaction with the second selected item after recognizing that the first item was not appropriate to the weather conditions.

Moreover, STS obtained a higher perceived recommendation quality than STS-S. We computed t-test in order to compare the average scores obtained by the two systems (Table 2). We note that statements Q5, Q6, Q7 and Q11 were negatively formulated. Hence, we inverted their scale (in Table 2) for the sake of comparison with the other ones. Among the statements that address the perceived recommendation quality, i.e., Q1–Q7, for two of them we measured a statistically significant different average response in two systems: Q4 (p value = 0.04) and Q6

(p value = 0.001). This means that the users believe that items suggested by STS are considerably more relevant than those suggested by STS-S, and STS users express that they do not like any of the suggested items less than in STS-S. This is a remarkable result and clearly indicates the improvement of STS over STS-S with respect to the perceived recommendation quality.

The second part of the questionnaire addresses the users' choice satisfaction (see again Table 2). Among the statements in this part, two received significantly different answers: Q8 (p value = 0.02) and Q9 (p value = 0.03). Hence, in comparison to STS-S, the users of STS liked significantly more their selected item and were more excited about it.

Finally, we analysed all the survey data in order to discover which system overall scored better with respect to users' perceived recommendation quality and users' choice satisfaction. We computed a score for each system by summing up the answers given by each user to each question, and then summing up the values for all the questions. For STS-S we obtained 618 (22.8 per user) total score of users' perceived recommendation quality and 528 (19.5 per user) total score of users' choice satisfaction. For STS these numbers were 667 (24.7 per user) and 537 (19.8 per user). Hence, in both cases STS achieved a higher score. We have also compared the total scores of the users of the two systems and got no statistical significance (t-test) for the users' choice satisfaction (p value = 0.28) but marginal significance for the users' perceived recommendation quality (p value = 0.07).

In conclusion, we can state that the users have perceived an overall higher recommendation quality and choice satisfaction when interacting with STS. Hence, taking into account the weather conditions, our CARS model produces a significant positive effect on the user decision process in comparison to STS-S that does not leverage the weather conditions when generating recommendations.

6 Conclusions

In this article we have presented a mobile context-aware recommender system called STS that recommends POIs using a set of contextual factors that include the current and forecasted weather conditions at the recommended POIs. The novelty of this approach relies on the usage of up-to-date weather forecast data into a matrix factorization algorithm to generate personalized context-aware recommendations. We hypothesized that our approach, implemented in STS, improves the choice satisfaction and the perceived recommendation quality of a simpler variant called STS-S that uses exactly the same prediction model and all the contextual factors used in STS except the weather conditions. In a live user study we successfully verified our hypothesis and showed that STS improves significantly the users' perceived recommendation quality and choice satisfaction of STS-S, hence showing that it is valuable to model and exploit this data into a tourism recommender system.

Our future work includes an extended analysis of the data obtained from this study to better understand potential performance differences among the compared CARSs, which may be due to the different usage of the weather contextual factors. In addition to that, we would like to test our proposed weather-aware CARS with a larger number of users and a larger rating dataset.

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Business Model of Mobile Service for Ensuring Students' Safety Both in Disaster and Non-disaster Situations During School Trips

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Abstract We are developing a mobile service for ensuring students' safety during the school trips that provides the current position and a history of movement during their trips for non-disaster situations and helps to escape in the event of a disaster. Since the Great East Japan Earthquake, teachers are now required to ensure the security of students during school trips. We developed the mobile service to solve this increasing social needs. During the development, we found some issues to be solved beside the technical problems. Namely, (1) monetization of the business, (2) limited sales channel, (3) anxiety about the treatment of personal information and (4) teachers' negative tendency to new technical tools. In this paper, from the viewpoint of the business, our approach to realize the service is described.

Keywords Tourist support · Mobile service · Disaster evacuation · Business model

1 Introduction

In Japanese senior high schools and junior high schools almost all students go on school trips. According to Japan School Excursion Association's survey, 94.4 % of junior high schools and 75.5 % of senior high schools answered they have conducted school trips in 2011 (Japan School Excursion Association 2013). This is one of the traditional events in Japanese schools, and we can trace the origin to the 19th century.

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School teachers are responsible for the safety of the students during school trips. Requests for students' safety expanded after the Great East Japan Earthquake in 2011. Many teachers, chaperones and parents need to use information technology in order to keep track of the students' positions. If teachers can keep track of the students' positions, they can quickly help them in the event of a disaster. However, it is difficult to use safety ensuring service using positioning technology mainly because that the service vender cannot construct their business model.

We propose a tourism information service for school trips that provides the current positions of the students and a history of their movement in non-disaster situations and helps the students to escape quickly to an evacuation area in an emergency or a disaster. However, we should solve some issues beside the technical problems. Namely, monetization, sales channel and privacy issues are to be solved. We have already published the overview of the information service we developed in another study (Kasahara et al. 2013). In this paper, from the viewpoint of the business, our approach to realize the service is described.

In Sect. 2, we describe the background of the school trip; the nature and the history, the change of the social needs caused by the Earthquake in 2011, and difficulties to realize the information service business for the school trip such as a privacy issue. In Sect. 3, related work is introduced. In Sect. 4, the proposed safety ensuring service that was developed by the academic-industrial alliance is described. In Sect. 5, the business model of the service is described. In Sect. 6, the issues of the service launch are described. In Sect. 7, we conclude the paper and future plan is described.

2 Background

2.1 What is the School Trip?

2.1.1 Nature of the School Trip

The school trip is one of the largest group trip market in Japanese travel market total. The number of students who go on school trips is approximately 3 million per year. This means almost all population who was born in the same year go on the trip with their school mates. Therefore, the school trip is the common experience among Japanese. The school trip market is heavily concerned with components of the Japanese tourism industry, such as travel agencies, accommodations, and local governments such as that of Kyoto City. Kyoto City is one of the most popular destinations for the school trips. Recently, some senior high schools have visited to foreign countries such as Australia, the United States, South Korea, Singapore and other countries. Figure 1 shows a student group in front of the hotel on their school trip.

School excursions in Australia are similar to Japanese school trips (Ritchie and Coughlan 2004). According to Ritchie and Coughlan, there is a wide range of

Fig. 1 Students in the school trip

various school excursions in Australia. Australian school can decide their destinations and durations of travel by themselves. In contrast to Australian school excursions, Japanese school trip is more formulaic. The duration of travel, trip cost, year grade, criteria for execution, destination area, number of escort teachers are rigorously defined by the board of education in each prefecture (Educational Tour Institute 2013). As a consequence of the regulation, Japanese schools have continued school trips in the same way, and the school trip market was firmly shaped. The regulation is beneficial for travel agency because (1) the market size is easy to forecast, (2) school's budget is clear, (3) the same services can be sold to all schools. Therefore, the school trip market is very important for Japanese travel agencies. Ironically, the flexibility in Australian school excursions may inhibit a school excursion market formation in the country.

2.1.2 Difference from Personal Trip

Teachers are responsible for the safety of the students during school trips. This is different from personal trips, where the tourists are responsible for their own safety. On the other hand, it is also expected that the students will exercise autonomy or independency during the planning process for these sightseeing tours and also while visiting the attractions (Amano et al. 1974).

2.1.3 Market Size

During the group activities, the students split into small groups that have 4–6 members. One of the member is selected as a group leader. Supposing each group leader uses one smartphone in which the service application is installed, potential number of users is approximately 500,000–750,000 because about 3 million

students go on a school trip annually. As similar market, short-term oversea education program, a study tour of university students and class trip in the elementary school exists. However, the sizes are not bigger.

The travel agency who is one of the research team estimates the average budget of school trip for one senior high school student. It is approximately 100,000 JPY per one student. The average budget of a junior high school student is approximately 60,000 JPY. Based on the estimate, approximately 1,000–2,000 JPY can be allocated to the security.

2.2 Change of the Social Needs Caused by the Earthquake

Before the quake in 2011, security methods for school trips are based on the premise that these methods will only be needed for accidents and minor incidents that occur during non-disaster situations. They are not designed for disasters. For example, the manual for school trips to foreign countries (Japanese Ministry of Land, Infrastructure Transport and Tourism 2009) only covers safety measures for non-disaster situations.

However, since the Great East Japan Earthquake in 2011, teachers and travel agencies are now required to ensure the security of students during the school trips because the students do not know where to evacuate in the destination. Also, during a disaster situation, the number of stakeholders who want to know the positions of the students increases dramatically. Information about the positions and safety of the students should be provided not only to the teachers who are on the trip, but also to the parents of the students and to the teachers who have stayed behind at the school. In situations where it is difficult for parents to confirm the safety of their students, it is possible for the disaster departments of local governments in the affected areas to be flooded with safety confirmation phone calls from parents. In fact, when the Great East Japan Earthquake occurred, the telephone system for the local government in Sendai City became unavailable. In this wise, the social needs that require students' safety information during the disaster situation increased.

2.3 Difficulties to Use the IT Service on the School Trip

In spite of the needs for the students' safety service, this kind of information service is not used for school trips popularly. Positioning technology that should be useful for ensuring students' safety has been developed already. It was possible to obtain positional information from GPS satellites or cellular phone cell stations by using assisted GPS technology (Djuknic and Richton 2001). In fact, some travel agencies rent GPS-equipped cellular phones to many schools. However, most students and teachers use the rental phones only for voice communication, and do

not use them for positioning. As the results of the interviews with related persons, we estimate the reasons why the safety ensuring services using information technology are not used popularly.

2.3.1 Difficult Monetization

The most important issue is how to monetize the safety information service business. As the nature of the school trip that student groups scatter all around the destination city, mobile service is suitable for the safety ensuring service. However, recently, mobile service vendors cannot earn enough revenue from the usage fee that is paid by customers because many services are provided with no charge, and GPS positioning services are the same. Many mobile service vendors earn an additional revenue from ads that are displayed on the screen of the cellular phones. However, we found that teachers do not like the ads because the teachers think that the ads are not suitable for educational situations. In fact, some inadequate sexual ads are often observed among mobile ads. A filtering service for hazardous sites are recommended for children by the Japanese government, however it is not so effective (Otsuka and Tanaka 2010). Therefore, the monetization method that mobile service is delivered cheap price or no charge and earn revenue from the ads are not used for school trips, and new monetization method that can earn enough revenue from another source should be considered.

2.3.2 Limited Sales Channel

School teachers purchase tickets, accommodations and other necessary services related to the school trips via travel agencies. Because of long-term relationships with the agencies, the travel agencies are only sales channels to schools. And then, the Japanese school trip market is an oligopoly market that two big travel agencies are dominant. Therefore, for promoting the service, it is essential to make good relationships with these oligopoly travel agencies.

2.3.3 Worry About Treatment of Personal Information

Generally speaking, there is a trade-off relationship between privacy and security. Also in case of school trips, students' positional information is considered as one of personal information. School teachers are generally sensitive about students' personal information, and careful treatment of the positional information is required. A dedicated website is established, and visualized information about potential information risk in case of school trip is introduced in the website (Information Security for Education Network 2013). This became an entry barrier for the mobile service vender to the market.

2.3.4 Negative Tendency Toward New Technology

The school trip is a traditional custom for Japanese school, and the manner of operation has already established. In addition, the teachers have tended to avoid using the information technology for education because most of them have no chance to take the training of information technology tools. Negative tendency toward new tools using information technology caused by these factors is observed among the teachers. Also, crimes linked to mobile dating services is emerging as a social issue in Japan (Mizunuma and Uchida 2009). This is one reason of teachers' negative attitude for mobile phone service.

Since implementing our service to school trips, these non-technical issues should be solved as the business model. In Sect. 5, our business model is described after a description of the service outline in Sect. 4.

3 Related Work

Disaster information is classified in terms of timeline. Namely, a disaster alert, a damage information, an evacuation information, and a restoration information (Hung 2003). The disaster alert consists of a disaster forecast information and a disaster outline information. The damage information is the information about damage status occurred by the disaster. This includes safety confirmation information. Evacuation information includes the call for evacuation. The restoration information covers various restoration information after the disaster such as lifeline restoration status. Teachers require to inform students' safety for teachers and evacuation area location for students. In this section, existing studies of disaster information services are described. However, the restoration information service is not included because this is out of scope of teachers' requirements.

In most cases when the disaster alert is provided, communication infrastructure such as the cellular phone network is alive. Therefore, disaster alert is delivered via normal communication services. In Japan, mobile information service named "Area Mail" provided by NTT DoCoMo is popular (NTT DoCoMo 2013). The information sources of the service are Japan Meteorological Agency, and local governments.

Among the damage information category, the safety confirmation information delivery is important because the safety information of disaster-affected persons are used for rescue, evacuation, and restoration. Specially, safety confirmation methods of elderly persons who need help for evacuation with sensors are proposed (Kondo 2011; Dong et al. 2010). Also, some system that can be used in case of network dawn or disconnection are proposed based on actual experience of network failure in past earthquakes (Nagai et al. 2004).

As just described, various safety confirmation system is proposed. However, proposals for tourists who are disaster-affected in unfamiliar areas is not enough. Therefore, we propose a new service for school trip students in this paper.

Table 1 Service specification of ETSS

Before trip	Planning in advance
	Display the position of observing attractions on the map
Non-disaster situation	Monitoring the student trajectories
	Track real-time students' position (Per 1 s)
	Send students' position to the server (Per 30 s)
	Store students' trajectories in the remote server (Tokyo)
	Graphical presentation of student trajectories
	Indicate students' current position and moving history
	Acquire the current positions of the students when the teachers require this information
Disaster situation	Graphical presentation of evacuation areas
	Display the evacuation areas near the positions of the students and teachers on the map
	Keep a map display in the case of the wireless network disconnection
	Display latest position of the students in cases where the teachers require this information
	Voice and mail communication
	Broadcast confirmation mail to students from teachers
	VoIP calls between the permitted users

4 Outline of Service

In this section, we describe the outline of out proposed service briefly. The detailed information of the service specification and user evaluations was described in the past studies.

4.1 Service Overview

We propose a GPS-enabled information service for school trips that is deployed as a smartphone application. This service is called Educational Trip Support Service (ETSS). The service specification of ETSS is described in Table 1. The main purpose is to obtain the students' positional information in order to ensure the safety of the students both in non-disaster situations and also during disasters. The characteristics of the ETSS are as follows.

- The histories of movement are stored on the server.
- The evacuation map can be used in cases where the wireless network is disconnected or down.
- Broadcast mail and voice communication are available for safety confirmations.

For the students, the application is provided as a smartphone application. For teachers, the application is provided as a smart tablet application. The size of the tablets is 10-inch. Tablets have good visibility for managing many student groups.

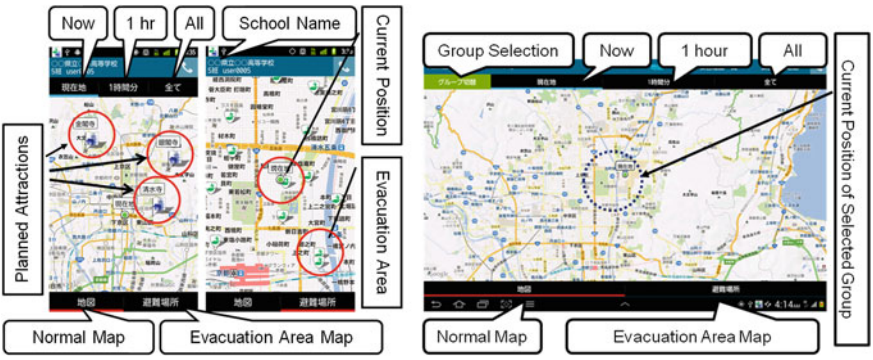

Fig. 2 Map application (*Left* for students.) (*Right* for teachers.)

Additionally, the students' positions and movement histories can also be viewed with PCs. The PC viewer is prepared for the teachers who stayed behind in the school during school trips.

4.1.1 Map Positioning

The application collects real-time GPS location data for each of the student groups and provides current positions and histories of movement. The location data is sent every 30 s and is stored on the server. Students can know their current position and moving history. Figure 2 shows the map application. Teachers can confirm the location of students at all times by using the data (see Fig. 2). In situations where wireless lines of communication are disconnected around the affected area due to a disaster, the second-master, who is located at the school and is not affected by the disaster, can obtain information about the positions that the student groups were located at just before the disaster struck.

4.1.2 Evacuation Map

The students can escape from the disaster only if they know their current positions. In addition, in order to escape, the students must know where to escape to. For the students, the evacuation area map can be used even when the wireless service is not available. The map data are incrementally downloaded to the smartphone in the non-disaster situation.

4.1.3 Direct Communication

As communication methods, the teachers can use broadcast mail and VoIP to confirm the safety of the students. The teachers need to know whether the students

are safe. However, they cannot confirm the status of the students by using only positional information. The importance of interactive communication methods does not change. We adopt VoIP call as the voice communication service because VoIP was thought that it would be disaster-resistant. The availability of the wireless network service decreased drastically after the Great East Japan Earthquake. Out of the various wireless network services, the availability of wireless data services, including VoIP, was better than that of wireless voice services.

Also, simultaneous mail transmission function and call history function of the ETSS mail service is useful for the teachers when they should confirm all students' safety in the disaster situation.

4.1.4 Information Access Restriction

The ETSS application uses the students' positional information, and this is one of the personal information that should be protected from illegal usage by a malicious third person. For protection, an access restriction function is adopted in the ETSS application. All teachers have access to positional information for all student groups. Access may be based on permissions. The students, on the other hand, have limited access only to their own group's information. In the ETSS application, the difference between the schoolmaster, the escort-teacher, and the second-master is defined by the range of the access authority. For example, the escort-teacher can access to the positions of the students' groups that the teacher is in charge.

5 Business Model

5.1 Revenue Model

For establishing a continuous business of the ETSS system, government grant or other charity money is inadequacy for monthly operating costs. However, the decision makers, the teachers in this case, expect very low price only for using mobile service that cannot afford to maintain the business. Therefore, for increasing the usage charge, the ETSS application is provided with the smartphones that the ETSS application is already installed. Namely, this is a kind of software bundling. Except of increasing the usage fee, the bundling has the following advantages.

- It looks similar to the existing rental cellular phone service.

For teachers, the ETSS bundled smartphone is easy to accept because they think the ETSS is an upgraded service of the rental cell phone service. They can compare the price and function to existing one.

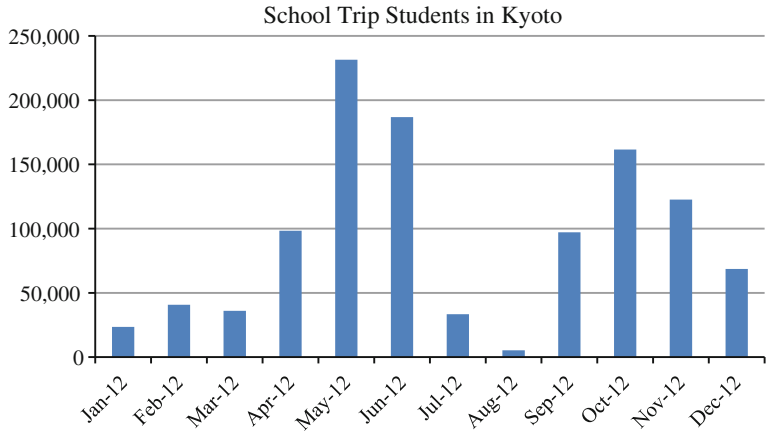

Fig. 3 School trip students in Kyoto in 2012 (*Source* Kyoto City Statistics)

- Hardware performance can be controlled.

We limit the model of smartphone hardware to one model, Samsung Galaxy S3. Therefore, the compatibility among different model and OS is out of consideration, and the cost of development becomes down.

By contrast to the advantage, enough number of smartphone should be prepared all year long. Because the school trip is very seasonal dependence shown in the Fig. 3, fixed communication fee of smartphones is burdened for the business. The season of the school trip is spring (from April to June) and autumn (from September to December), and the amount of school trip during summer and winter are very low and most of the smartphones remain power-off. This is an opportunity loss of the capacity. In order to overcome the opportunity loss, we are looking for another opportunity of the ETSS with the travel agency. In that context of opportunity search, it is important to cooperate with the travel agency that have much knowledge of the travel market and sales channel.

5.2 Alliance with One of the Dominant Company

For realizing the ETSS service, existing business alliance that consists of a travel agency and accommodations for school trip is not good for this new IT service because the alliance is optimized for existing non-IT services. Therefore, for gathering necessary functions for new service, an academic—industrial alliance was constructed shown in Fig. 4. Service vendor is a charitable corporation that was established for the support for anti-disaster education. Kyoto University acts as an advisor for technical and business issues. As the sales channel for schools, this is the most important role, one of the oligopoly travel agencies joins the alliance. A software house joins for development and operation of the ETSS application.

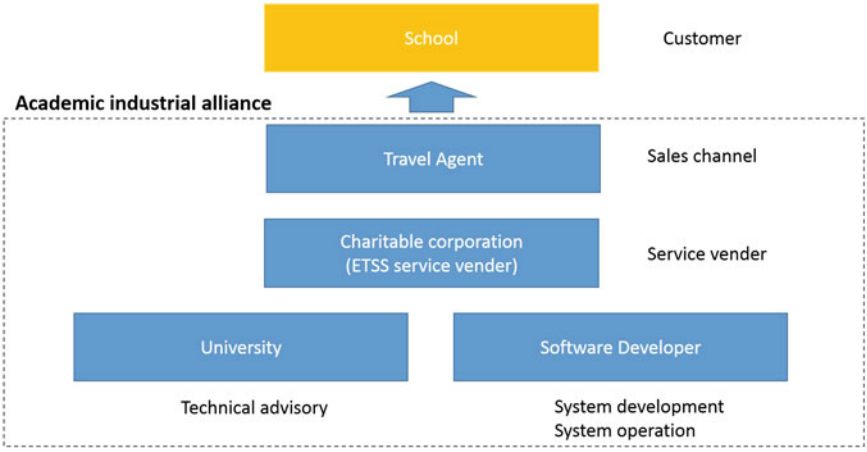

Fig. 4 Academic industrial alliance for the ETSS

The purpose of the charitable corporation is to enhance ETSS to schools all over Japan for anti-disaster education. The travel agency wants to strengthen the competitive power toward the competitors in the school trip market by using ETSS. The university can gather students' GPS tracks for research through the corporation with the alliance. This alliance has been working well since 2011. Service designing and application development had already done, and some field experiments were conducted (Kasahara et al. 2013). The alliance team is preparing for the release of the ETSS service in 2013.

5.3 Personal Information

Treatment of positional information should be sensitive as described in Sect. 2.3.3. We should overcome teachers' worry about privacy and adequately manage the positional information stored in the system.

As the result of experiments, we found that teachers give weight to security than privacy, and students accept GPS tracking by ETSS (Kasahara et al. 2013). Teachers and students accepted positional information usage based on adequate data management by non-profitable organizations, namely university and the charitable corporation. For maintaining their trust towards non-profitable organizations, university built data-handling rules of the personal information including positional information for ETSS. This rule builds a feeling of safety to the teachers. After usage of the ETSS service, positional information is converted to anonymous information that can be used for research. Of course, used for research is permitted by school in the contract.

6 Service Launch

In this section, some issues with the ETSS service launch are described. For business start-up, stable financial basement is necessary. Therefore, in this section, governmental financial aid as an initial capital and the cost structure of this business are explained. In addition, service area expansion of the metropolitan area for future business are explained.

6.1 Financial Aid

ETSS service vendor is financially aided by Kyoto city local government. This is a grant employment aid established for small companies in Kyoto city, and this is used for employees who operate daily operation such as smartphone setting and delivery, and a part of aid is used for system development. Except of the governmental aid, a local bank will assist financially after service launch.

6.2 Cost Structure

As for the cost structure, the proportion of capital investment is very small. The biggest capital expenditure is developing fee of the ETSS system. The ETSS service vendor will pay only the monthly system operating fee as Application service provider (ASP) after the system developed because the server system is owned by the software developer. The number of smartphones that was rented for schools is over hundreds. However, expenditure for smartphones is paid as the monthly fee to a mobile telecom company under an instalment-sales contract. As the operating expenditures, we accomplished cost reduction. The fixed monthly smartphone charges are held down by using the buying power of partner travel agency. ASP fee paid to software developer is charged at usage base.

6.3 Expansion Schedule

The ETSS service vendor will start the service from Kyoto city, and will expand the service area to Tokyo metropolitan area in the near future because these cities are the top two domestic destinations of school trips. By this expansion, the revenue will increase. Also, Tokyo is the main destination for schools located in West Japan and Kyoto is the main destination for schools in East Japan. Therefore, the competition among these cities is relatively low.

7 Conclusion and Future Plan: GPS Trajectory Data Sharing

In this paper, we introduce a tourism information service named ETSS and its business model. ETSS combines existing components and does not require technical novelties, however, it was very difficult for implementation of the actual service. As for students' privacy.

We have some future research plan related to ETSS. The students' GPS trajectory data can be used for the research after transforming to the anonymous data described in Sect. 5.3. Now only data that was gathered in the field experiments is available. However, after commercial launch to the market, the anonymous GPS trajectory data will be stored daily, and we will construct a database that other researchers can use for their research. We think the GPS trajectory data sharing with other researchers in addition to this students' data contributes to the evolving of GPS trajectory analysis. We are seeking a partner of this idea.

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Predicting from GPS and Accelerometer Data When and Where Tourists Have Viewed Exhibitions

Junya Kawase, Yohei Kurata and Naoto Yabe

Abstract Research has been conducted to understand tourists' spatio-temporal behaviours. However, it is very costly to investigate what the tourist was actually doing at each location and moment and what he/she was interested in Kawase et al. (When and where tourists are viewing exhibitions: Toward sophistication of GPS-assisted tourist activity surveys. Springer, Vienna, pp. 415–425, 2012) demonstrated the possibility that we can predict only from a tourist's GPS log whether he/she is viewing an exhibition or not, which is one of the most basic activities in tourism. Following their work, we conduct an additional experiment two types of subjects, students and kindergarteners with parents, and refine the prediction model with additional explaining parameters. We found that the model for students could be successfully improved, while that for kindergarteners has a problem due to the inconsistency of their behaviour. In addition, we experimentally investigated the combined use of a GPS sensor and an accelerometer, both usually equipped in smartphones, for predicting tourists' viewing state. The result shows that the combined use of these sensors seems promising to infer tourists' activities.

Keywords Tourist behavioural survey · Activity prediction · GPS · Accelerometer · Logistic regression model · Zoological park

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1 Introduction

Better understanding of tourists' spatio-temporal behaviours is beneficial for many parties in tourism. If their behaviours are well-understood, it would be possible to optimize transportation, operations of tourist attractions, and marketing strategies, all in line with their actual needs (Thornton et al. 1997). In addition, such knowledge will contribute to evaluating the current state of tourism resources, improving the design of tourist spaces, and providing appropriate information to tourists.

There have been many pieces of research work that aims at the understanding of tourists' spatio-temporal behaviours. They are distinguished into two groups: those that targets macro-level behaviours and those that focuses on micro-level behaviours. Diary surveys (e.g., Thornton et al. 1997) and GPS-assisted surveys of vehicle transitions (e.g., Nagao et al. 2004) are examples of the macro-level tourist surveys. On the other hand, observation (e.g., Matsunami 2007), GPS-assisted surveys of pedestrians within a city (e.g., Shoval and Isaacson 2007a) and behaviour surveys in museums using RFID tags (Kanda et al. 2007) or Bluetooth (Yoshimura et al. 2012) are examples of the micro-level surveys. Macro-level surveys are important for considering transportation services, while micro-level surveys are necessary to know what impress tourists and eventually to consider how to give more satisfaction to them.

Observation is a nice method to get insight and hypotheses about consumers' behaviours and thus, it is re-evaluated in the study of service science (Matsunami 2007), but it requires considerable human cost. On the other hand, the methods using sensing devices, such as GPS and RFID, allow us to get a large volume of tourists' data, but this data itself tells only the location history of tourists—not what they were doing or what impressed them. Eye-mark recorders and electroencephalographs may tell us what tourists get interested in, but these devices are very costly and their appearances are not suitable for the experiment in actual tourism environment.

Kawase et al. (2012) demonstrated that we can predict a tourist's viewing state (i.e., whether he/she has been fixing his/her gaze on an exhibition or not at each moment) to a certain level only from his/her GPS log, by analysing the relationship between video-recorded tourists' activities and their GPS logs and making a statistical model. Viewing is one of the most basic activities in tourism. In their studies, they showed a gap between staying time (i.e., how long tourists stay at each tourist facility) and viewing time (i.e., how long they fix their gaze on its exhibition). This implies that staying time alone is probably not sufficient to evaluate each tourist facility in micro-level studies. By extending their study, it will become able to comprehend tourists' activities in a tourist facility from a GPS-assisted survey which costs much less than observations. If so, it is nice to conduct such a survey repeatedly in tourist facilities from a viewpoint of PDCA cycle.

Kawase et al.'s (2012) work, however, left several problems. First, they considered only one parameter, walking speed, to predict tourists' activities. Second, they had only five subjects, who were all in their early twenties. Third, the experiment field was limited to a zoological park. And finally, they considered only one type of activities in tourism—viewing. Thus, following their work, we tackle with the first and second problems. In addition, we experimentally investigate the combined use of a GPS sensor and an accelerometer, because both sensors are now installed in smartphones and thus the potential to use them in tourist behavioural surveys is rapidly increasing. Our contribution will enrich the potential of GPS-based behavioural surveys in tourism studies.

The remainder of this paper is organized as follows: Sect. 2 explains the background of this research. Section 3 reports our new experiment and the resulting two models which predict tourists' viewing state. Section 4 reports another experiment using a GPS sensor and an accelerometer, together with a report of its preliminary result. Finally, Sect. 5 concludes with a discussion of future work.

2 Background of GPS-Assisted Tourist Activity Surveys

Today GPS-equipped devices, such as car navigation system and smartphones, are almost ubiquitous all over the world. Along with this trend, activity surveys using GPS-equipped devices have been conducted in various fields (Yabe et al. 2010). Especially in transportation studies of motor vehicles, GPS-assisted surveys have been conducted extensively, because GPS devices are easily installed on them (Shoval and Isaacson 2007a). For example, Nagao et al. (2004) analyzed tourists' transition patterns between cities based on rent-a-cars' GPS data. In addition, some studies targeted pedestrians to clarify their movement patterns in a city (Asakura and Hato 2004; Asakura and Iryo 2007; Shoval and Isaacson 2007b), as well as the spatial use of a city by tourists (Shoval 2008). Some studies investigated tourists' movement patterns in tourist facilities such as a theme park (Birenboim et al. 2013) and a zoological park (Yabe et al. 2010). However, it still remains as a research challenge to develop a technique for inferring tourists' activities from their GPS logs (Kawase et al. 2012).

Kawase et al. (2012) conducted an experiment to investigate the relationship between people's activities and their walking speed. The experiment was conducted on May 2011 at Tama Zoological Park in a suburb of Tokyo with five university students in the early twenties. The subjects were asked to go around the zoological park with a tiny GPS logger, while their activity was video-recorded by experimenters. From this video, the experimenters developed an activity log which records whether each subject was fixing his/her gaze at an exhibition or not at every second, and combined this data with the subject's GPS log. Then, a logistic regression model in Eq. 1, with which we can predict a visitor's viewing state from his walking speed, was estimated. In Eq. 1, p_t and v_t mean the probability of

viewing and walking speed at time t, respectively. When we applied the estimated model to the GPS logs and regarded that each subject had been viewing an exhibition at time t when $P_t > 0.5$, the model's *predictive value* (the rate that the model successfully discerns the visitor's viewing state) was 68.4 %. On the other hand, as Yabe et al. (2010) did, if we regarded that the subject had been viewing an exhibition when they had been within 3 m from it, the predictive value was only 56.7 %. This implies that the time people have spent near an exhibition is not sufficient (and sometimes misleading) to evaluate how long they have enjoyed it (Kawase et al. 2012).

$$\text{logit}(p_t) = \log_e\left(\frac{p_t}{1-p_t}\right) = \beta_0 + \beta_1 v_t \tag{1}$$

	Estimate	Standard deviation	Chi-squared	p value	Exp (estimate)
β_0	0.6194	0.0226	752.1810	0.0000	
β_1	−0.3237	0.0105	948.5306	0.0000	0.7235

3 Additional Experiment Toward More Reliable Models

To predict peoples' viewing states, Kawase et al. (2012) considered only one parameter—walking speed. Although this parameter has a high explanatory power, we should also examine other parameters—for example, the distance from a visitor to the nearest exhibition. In addition, their experiment had only five subjects all in their twenties, while the statistics shows that the largest group of customers of Tama Zoological Park is families (i.e., parents with children). We, therefore, decided to conduct an additional experiment in the same zoological park with a larger number of subjects, including families. The experiment was conducted from October 25th (Tue) to 29th (Sat) 2011. In this experiment, again, the subjects were asked to go around the zoological park with a tiny GPS logger (Fig. 1). We had two subject groups: five student pairs in their 20s and nine families [parent(s) with kindergartener(s)]. In the former group, one of each pair filmed another's activities. This result was integrated with the data of Kawase et al. (2012). In the latter group, our staff followed each family and video-recorded their activity. We asked the kindergartener (if multiple, the elder one) to carry a GPS logger, because we expect that the parents cannot view exhibitions freely disturbed by their children.

Figure 2 shows the plan of Tama Zoological Park. Since its plan is quite complicated due to its hilly terrain, its management staffs strongly wanted to know how the park was used by visitors.

After the experiment, we carefully refined the obtained GPS logs by removing the log points recorded while the subject had been in indoor environment. On the other hand, we made from the video the activity log of each subject, which

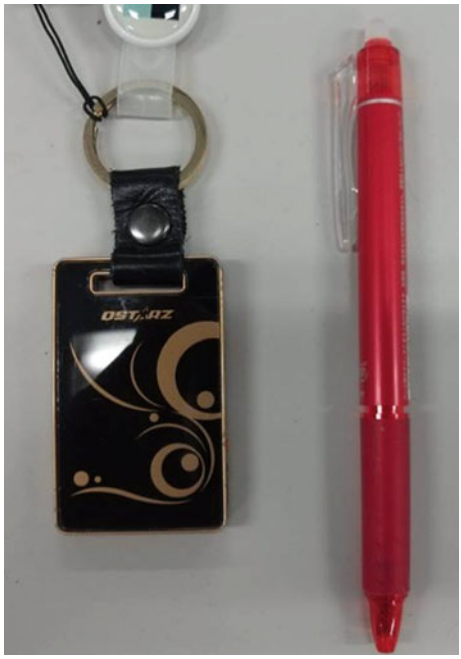

Fig. 1 A GPS logger used in our experiment (Qstarz Black Gold 1300) beside a pen

recorded precisely whether the subject had been fixing their gaze at an animal exhibition or not at each second. Then, using the time stamps of both logs, we combined the GPS log and the activity log of each subject.

From the combined logs, we built a logistic regression model for each group. At this time, we consider the following parameters for explaining the subject's viewing state at time t: walking speed v_t, increase of speed from the previous log point a_t, distance to the nearest exhibition d_t, decrease of this distance from the previous log point, standardized by the distance $r_t^- = -(d_t - d_{t-1})/d_t$, and the successive decrease of the distance to the next log point, standardized by distance $r_t^+ = -(d_{t+1} - d_t)/d_t$. These five parameters were selected with a step-wise selection method ($p = 0.2$). Note that r_t^- and r_t^+ may take very different values, as visitors of zoological park (especially small children) often repeat walking and stopping in every few seconds.

Equation 2 shows the model estimated for the student group. In this model, r_t^- was not selected as a significant parameter. This model indicates that the subject is viewing an exhibition more likely when he/she is located close to the exhibition, walking slowly or pausing, and approaching to the exhibition. Interestingly, the coefficient of a_t is positive. This is probably because the situation where people quickly speed up often occurs when they get interested in an approaching exhibition in their view, while even when they slow down to see an exhibition, the decrease of speed is not intensive.

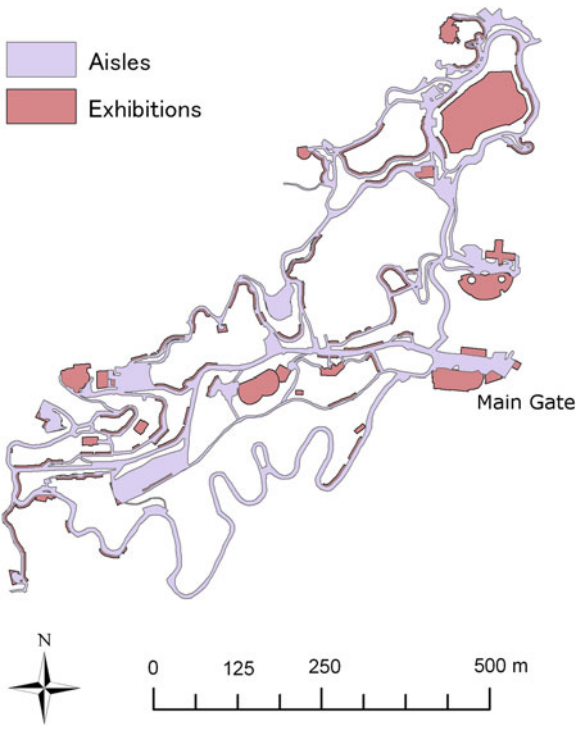

Fig. 2 The plan of Tama Zoological Park

$$\text{logit}(p_t) = \beta_0 + \beta_1 v_t + \beta_2 a_t + \beta_3 d_t + \beta_4 r_t^+ \quad (2)$$

	Estimate	Standard deviation	Chi-squared	p value	Exp (estimate)
β_0	1.6713	0.0231	5,243.7826	0.0000	
β_1	−0.6531	0.0099	4,312.5704	0.0000	0.5204
β_2	0.2217	0.0197	127.1331	0.0000	1.2481
β_3	−0.0747	0.0015	2,472.2617	0.0000	0.9280
β_4	−0.0107	0.0039	7.4203	0.0000	0.9893

The model's NagelkerkeR^2 was 0.3106, which was much better than that of the model using v_t alone (0.2063). When we applied this model to the students' GPS logs and regarded that the subject had been viewing an exhibition when $p_t > 0.5$, the model's predictive value was 71.71 %, which was slightly better than that of the model using v_t alone (70.46 %). In addition, both positive predictive value (i.e., the rate of successful prediction while the subject has been viewing an exhibition) and negative predictive value (i.e., the rate of successful prediction while the subject has been not viewing an exhibition) are high (Table 1), which assures the reliability of this model.

Table 1 Number of activity logs of the students in their twenties

		Prediction		Success rate (%)
		Viewing	Not viewing	
Actual	Viewing	18,790	6,438	74.48
	Not viewing	6,369	13,670	68.22

Equation 3 shows the model estimated for the kindergartener group. In this model, r_t^+ was not selected as a parameter. This model basically indicates that the subject is viewing an exhibition more likely when he/she is located close to the exhibition, and walking slowly or pausing.

$$\text{logit}(p_t) = \beta_0 + \beta_1 v_t + \beta_2 a_t + \beta_3 d_t + \beta_4 r_t^- \tag{3}$$

	Estimate	Standard deviation	Chi-squared	p value	Exp (estimate)
β_0	0.5449	0.0211	669.750	0.0000	
β_1	−0.3137	0.0098	1,014.3073	0.0000	0.7308
β_2	0.0712	0.0200	12.7142	0.0004	1.0738
β_3	−0.0902	0.0020	2,060.2309	0.0000	0.0321
β_4	0.0068	0.0231	0.0231	0.1564	1.0068

The model's NagelkerkeR^2 was 0.2085. When applied to the kindergarteners' GPS logs obtained in our experiment, the model's predictive value was 69.77 %. However, the positive and negative predictive values were unbalanced, which indicates the model's insufficiency (Table 2).

In sum, the model for the students was successfully improved by considering additional parameters, while these parameters were still insufficient for modelling the kindergarteners' viewing state. This is mainly because the walking speed of the kindergarteners does not have much explanatory power as that of the students. Figure 3 shows the probability of viewing in relation to the walking speed. This graph shows that the walking speed has a clear linear relation to the probability of viewing for the students (the thicker line), but not for the kindergarteners (the thinner line). Even when walking slowly, the kindergarteners often do not see exhibitions. We also found from our video that the kindergarteners showed interests in many things and switched their focus quickly from one thing to another. In other words, small children have more variety of activities than adults at each speed level.

Of course, adults also have possible activities other than viewing an exhibition—for instance, looking at a map, using a cellphone, chatting with somebody, waiting, and smoking—even in front of an animal exhibition. Can we distinguish these non-viewing states by the use of additional data? Section 5 seeks the answer to this question, using an accelerometer as an additional data source.

Table 2 Number of activity logs of the kindergartners

		Prediction		Success rate (%)
		Viewing	Not viewing	
Actual	Viewing	4,548	8,064	36.06
	Not viewing	3,127	21,337	87.22

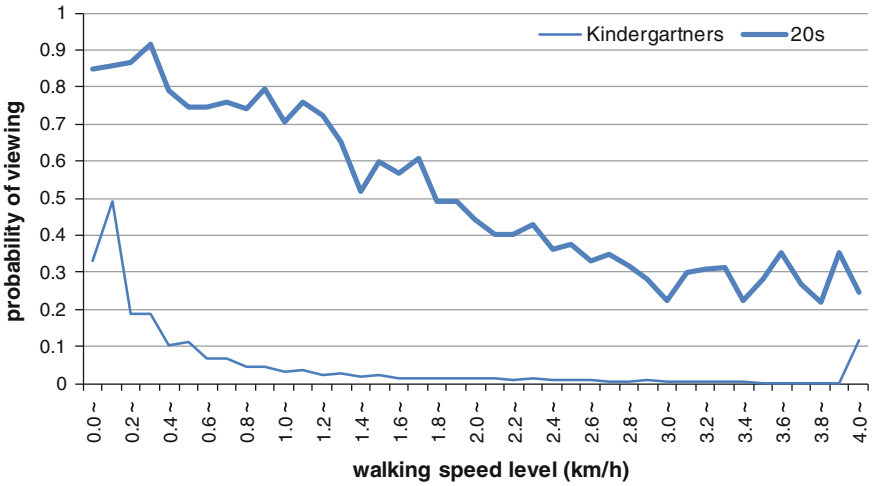

Fig. 3 A relation between probability of viewing and walking speed

4 Additional Use of Accelerometers for Predicting Activities

We are considering the use of accelerometers, in addition to GPS sensors, to predict tourists' activities more precisely. Both a GPS sensor and an accelerometer are installed in most smartphones and accordingly, have potential in the study of tourists' behaviours. If we can use the sensors in smartphones, we do not need special sensing devices, which usually cost much more than smartphones. In addition, many people already own their smartphones. If they allow us to use their smartphone's sensors for our experiment, the subjects do not have to carry extra load during their trip, we do not have to worry about distributing and collecting devices, and may be able to obtain the data from a larger number of people with less cost.

The studies of human behaviours using accelerometers are already seen in many fields. Randell and Muller (2000) and Akahori et al. (2005), for example, predicted people's basic movement, such as walking on a flat surface and ascending/descending stairs, from the output of a single accelerometer placed at the subjects' trouser pocket and chest, respectively. Kern et al. (2004) and Intille

Fig. 4 An accelerometer logger (ATR-Promotions TSND 121) used for our experiment, beside a pen

et al. (2004) predict the subjects' posture and actions using multiple accelerometers placed at several parts of human bodies. Recently, a number of behaviour studies have considered the use of accelerometers in smartphones, thanks to their widespread use. For example, Miyazaki et al. (2010) discerned the subject's walking and resting, as well as his/her posture during resting, from the sensor data of smartphones in his/her hand. When using smartphones for behavioural studies, we have to consider its position which gives considerable impact on the resulting data. Some studies tried to predict the position of smartphones from the output of sensors (e.g., Miluzzo et al. 2010), although this prediction is still difficult.

Currently we are conducting a new experiment applying both GPS and accelerometers at the same zoological park. We are using a pair of the same GPS logger (Fig. 1) and a light-weight accelerometer logger (Fig. 4), instead of smartphones, such that we can compare the result of a new experiment with our previous ones. We place these loggers at the top of the subject's head, using a cap with a pocket (Fig. 5). This is because (1) we have to fix the position of the sensors, (2) the use of a cap looks natural in a tourist area and it is easily put on/off, (3) positioning at the head looks highly potential to predict the subjects' viewing activities (e.g., turning head to see something), and (4) in future it will become natural that people carry a wearable device that equips with various sensors (e.g., Google Glass) on their head. We align the sensor's x-axis to the face's front/back direction, y-axis to its left/right direction, and z-axis to its up/down direction (Fig. 5).

In this paper, we report the result of our pilot study with a single male subject in their twenties. Just like our previous experiments, we asked him to go around the

Fig. 5 A cap for mounting GPS and accelerometer loggers on the subject's head

zoological park for about 2 h. At this time we used an ear-mount video camera (Fig. 5-right) and regarded that the subject had been viewing an animal exhibition when the exhibition was video-recorded at the centre of its screen. To explain the subject's viewing state at time t, we first examined the following seven parameters: walking speed v_t, acceleration in the direction of x-, y-, and z-axes a_t^x, a_t^y, and a_t^z, and angular velocity around x-, y-, and z-axes ω_t^x, ω_t^y, and ω_t^z. We did not apply any modification to the sensor output. The acceleration and angular velocity are recorded at every 20 ms. Then, we calculated the average of absolute value of each output for every second, considering that these parameters indicate the intensity of the subject's movement. We, however, found a multicollinearity between a_t^x and a_t^z and that between ω_t^x and ω_t^z. This was probably because there was correlation between gait cycle movement in front-back direction and that in up-down direction. Thus, we removed a_t^z and ω_t^z from the candidates of explaining parameters.

Equation 4 shows the estimated logistic regression model. This model indicates that the subject is viewing an exhibition more likely when he/she is taking slower action (i.e., less walking speed, less acceleration, and less angular velocity).

$$\text{logit}(p_t) = \beta_0 + \beta_1 v_t + \beta_2 a_t^x + \beta_3 \omega_t^x + \beta_4 a_t^y + \beta_5 \omega_t^y \tag{4}$$

	Estimate	Standard deviation	Chi-squared	p value	Exp (estimate)
β_0	4.0288	0.1806	497.7833	0.0000	
β_1	−0.3413	0.0372	84.2470	0.0000	0.7109
β_2	−0.0001	0.0000	6.2691	0.0123	0.9999
β_3	−0.0002	0.0001	5.1617	0.0231	0.9999
β_4	−0.0012	0.0001	270.7085	0.0000	0.9999
β_5	−0.0006	0.0001	102.5665	0.0000	0.9999

Table 3 Correlation matrix of parameters

	v_t	a_t^x	ω_t^x	a_t^y	ω_t^y
v_t	1.000	0.095	0.239	0.451	0.382
a_t^x		1.000	0.043	0.144	0.104
ω_t^x			1.000	0.404	0.277
a_t^y				1.000	0.651
ω_t^y					1.000

The model's NagelkerkeR^2 was 0.4635. When applied to the subject's GPS logs, this model correctly discerned his viewing states over 76.67 %. This result is better than the model for students in Sect. 3 (NagelkerkeR^2: 0.3106, predictive value: 71.71 %) and the model for the same single subject but using v_t alone (NagelkerkeR^2: 0.20, predictive value: 67.99 %). We also confirmed that there is no significant correlation between walking speed and acceleration in each direction, as well as between walking speed and angular velocity around each axis (Table 3). From these facts, we can conclude that the output of accelerometers seems highly useful for improving the reliability of the prediction model.

5 Conclusions and Future Work

The knowledge about tourists' spatio-temporal behaviours is useful for tourist facilities to evaluate and improve their resources. Following Kawase et al. (2012) that had shown the possibility of predicting tourists' viewing state in a zoological park from their walking speed, we revealed that we can make more reliable model for youth by considering additional parameters available from GPS logs. On the other hand, we also found that it is difficult to predict kindergarteners' viewing state from the same parameters due to the inconsistency of their behaviours. In addition, we demonstrated the combined use of a GPS sensor and an accelerometer, both built in smartphones and emerging wearable devices, allows more reliable prediction of tourist viewing state. Especially, the result of our experiment implies head-mount wearable devices will allow more precise prediction, since it can precisely measure the direction of the user's head.

We, however, left several challenges for future. First of all, in order to increase the reliability of our prediction models, the number and the variety of subjects should be increased. We primarily examined two typical groups of zoological park visitors (families with small children and youths), but actually zoological parks have various types of visitors, all of which can be the target of future work. Second, we should examine the validity of our prediction method in other sorts of tourist facilities (e.g., art exhibitions and theme parks), since we have examined only a zoological park. Third, we should apply our prediction model to the result of actual GPS-assisted surveys and demonstrate the practicality of our method in improving the management of tourist facilities.

Our current method predicts the viewing state at time *t* only from the log of the same moment. However, since human activities are always successive, the knowledge about what the visitor have been doing before *t* should be crucial for predicting the activity at *t*. Thus, our future work will explore the viewpoint of time sequence for predicting tourists' activities. Furthermore, we want to consider other sorts of tourists' activities (e.g., taking a rest), as well as their tiredness. By integrating the predictions, we can infer the underlying context of the tourists' behaviour, which in turn is useful for deriving more reliable predictions of tourists' activities.

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Part II
Social Media Marketing Strategies

An Investigation into the Use of Social Media Marketing and Measuring its Effectiveness in the Events Industry

Alessandro Inversini and Emma Sykes

Abstract Social media are seen as a new marketing tool in the service industry. Digital marketing communication is nowadays interactive and marketers are looking at social media as a means to reach a wider audience. After reviewing current practices and measurement techniques, this study investigates how events companies are exploiting this new communication means. The research has been designed with a case study approach: different marketing figures in three different companies have been interviewed. Results show the importance of social media in events companies and the lack of professional measurements. Furthermore, results show the importance of senior management commitment towards the use of social media as marketing tool.

Keywords Events · Social media · Social media measurement

1 Introduction

Social media has grown at exponential rates (Bradley 2010), taking only a year and a half to reach fifty million users (Nair 2011). The introduction and growth of social media has therefore altered the marketing field (Hanna et al. 2011) and specifically the development of the communication process (Mangold and Faulds 2009). Communication is now occurring interactively and on a mass scale in comparison to traditional one way communication (Hoffman and Novak 1996). Social media enables companies to reach vast amounts of people (Safko and Brake 2009); thus allowing content to be spread to this enlarged audience (Hanna et al. 2011).

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From this, it would seem that social media are a popular marketing tool; however simultaneously it presents difficulties; specifically in regards to quantifying the return of social media (Hoffman and Fodor 2010). Measuring social media effectiveness has therefore proved to be an immense obstacle for marketers when incorporating social media into marketing communications (Dzamic 2012). For this reason numerous marketers are asking how social media effectiveness is measured (Dzamic 2012). As a result a number of authors propose frameworks and measurement metrics to aid marketers in quantifying social media investments; specifically since it is argued that measurement is a vital part in the success of social media (Murdough 2009; Solis 2011). Despite this, the techniques suggested in the literature focus on measurement for businesses in general, whilst additionally there is insufficient research surrounding the events industry and how technology companies or brands are measuring their social media campaigns.

Social media are becoming popular also in the event industry. Numerous event companies are using social media in event promotion. In the last few years it has been shown an increase up to 90 % of event producers using one or more social platforms (Hughes 2012). But the use of social media and the evaluation of their effectiveness in the event sector remains under investigate.

These issues therefore provide a rationale for undertaking this study, which investigates how technology related companies and brands, in the events industry, are measuring the effectiveness of social media. Three case studies from the technology events industry have been opportunistically selected. The three case studies represent establishments that have in their core business the organization and management of technology related events in different fields and therefore it can be assumed that they are forerunners in the use of technologies and social media for events. The scarce literature surrounding social media and events focuses on the business industry, mega events and festivals; all case studies here are in the conference events industry. This study therefore aims provide insight and attempt to add to the current literature surrounding social media measurement in the events industry.

2 Literature

With the introduction of social media, there has been an apparent shift from one-way (traditional) communication to mass communication with customers obtaining greater control over conversations (Kaplan and Haenlein 2010; Solis 2011; Weinreich 2011). For this reason, Kietzmann et al. (2011) argue that the communication of businesses has become democratized. The literature in this area highlights the shift towards a new marketing direction, with consumers as a focal point and ignoring marketer's needs; this is known as the social media revolution (Brennan and Croft 2012). Furthermore, a reoccurring theme is the importance of integrating social media with traditional channels (Evans 2008; Hanna et al. 2011; Powell et al. 2011). Mangold and Faulds (2009) additionally argue that social

media should not be disregarded from the promotion mix, but added as a hybrid element constructing the new communications paradigm. As a consequence, marketers will be more effective in both reaching their goals and customers (Mangold and Faulds 2009).

Social media presents a number of positive impacts, such as brand promotion via eWord of Mouth (eWoM—Hennig-Thurau et al. 2004) and the ability to reach and connect with a vast amount of people (Safko and Brake 2009). Bradley (2010) states how social media is unavoidable, customers will talk about businesses or brands (Kietzmann et al. 2011), while Safko and Brake (2009) argue the key is to concentrate on influencing and enabling conversations. Various authors highlight the importance of ensuring the consumer is at the core of social media marketing strategy; specifically the customer investment, engagement and motivations for using social media (Hoffman and Fodor 2010; Moran and Gossieaux 2010; Geho and Dangelo 2012). Marketers must be aware of this new direction and, as Moran and Gossieaux (2010) state, this shift to mass communication, named 'hyper-sociality', gives consumers the ability to alter messages and disseminate them among various platforms.

Additionally, social media measurement plays a significant role as the key to success (Murdough 2009; Solis 2011) because measurement enables the impacts of consumer dialogue to be quantified (Murdough 2009). Dzamic (2012, p. 198) on the other hand argues marketers already have the tools for effective social media measurement, the issue is the "inadequate tracking between different digital platforms". Whilst Safko and Brake (2009) conversely argue integration of social media into traditional marketing efforts is the key to measuring the Return On Investment (ROI). Alternatively, a number of scholars argue the importance of focusing on business goals and using Key Performance Indicators (KPIs) as metrics for measuring social media marketing (Owyang and Lovett 2010; Solis 2011). Furthermore, several authors highlight the value of starting with defining goals and measurable objectives for a successful social media campaign (Evans 2008; Murdough 2009; Sterne 2010). From this, it would seem it is imperative to measure a social media campaign in order for it to be effective (Castronovo and Huang 2012); thus marketers should integrate social media and traditional marketing focusing on ROI, whilst also focusing on the use of goals and KPIs. Nonetheless it is clear that there is a lack of consensus on the measurements techniques with regards to social media.

The literature also reveals a number of social media measurement words, such as loyalty (e.g. Evans 2008; Uitz 2012, Castronovo and Huang 2012), influence (e.g. Blowers 2012), awareness (e.g. Fisher 2009; Hoffman and Fodor 2010), engagement (e.g. Li 2010; Sterne 2010; Blowers 2012) and reputation (e.g. Marchiori and Cantoni 2012). Hoffman and Fodor (2010) argue measurement of awareness should centre on consumer investment such as the frequency, time spent on the platform and brand mentions. Murdough (2009) notes how marketers should be asking questions such as: how much of consumer engagement with the website occurs from social media efforts? Authors also highlight, how in measuring the engagement level, the return on investment of a social media marketing campaign

can be calculated (Powell et al. 2011; Weinreich 2011). For this reason, it is argued the influential measurement tool of them all could perhaps be engagement (Blowers 2012). Further to this, authors have proposed various measurement frameworks such as: Internet Advertising Bureau's Social Media Council framework (IAB SMC 2010); Schottmuller's (2012) Social Media Strategy Funnel; Owyang and Lovett's Social Media Measurement Framework (2010); Powell et al. (2011) Community Engagement Framework and The Engagement Pyramid (Li 2010). Due to the criticisms of IAB's framework for its generalized approach (Dzamic 2012) and the emphasis around engagement, the primary research applies the Engagement Pyramid (Li 2010) and Community Engagement Framework (Powell et al. 2011) to the technology events industry. As regards the event industry, social media are increasingly being used in events and event promotion and as Hughes (2012) highlights, social media has grown in significance in the events industry, with an increase in the last few years from 30 to 90 % of event producers using one or more social media platforms. Various authors highlight the use of Twitter to increase engagement both before an event (Hambrick 2012) and during (Ross et al. 2011). Lee et al. (2012) additionally note the use of Twitter for event managers to both market to potential customers, whilst also remaining constantly in contact with attendees. Moreover, Ellison et al. (2007) point out the significance of Facebook for event managers to enhance brand awareness and potentially result in the purchase of a ticket. Lee et al. (2012) further note the use of Facebook for event marketers promoting an event, aiding interaction prior to an event. From this, one could therefore argue that social media, predominantly over the last few years (Hughes 2012), has become a useful and important tool for event planners to use, particularly to increase engagement and awareness with attendees.

As a consequence, this study has been designed to tackle the issue of social media marketing measurements in event companies and brands. Whilst it is apparent that social media is used in the events industry, specifically to increase customer engagement and awareness, literature focuses on the business industry, festivals and mega-events. Additionally, there is a limited amount of research on the use and measurement of social media in the technology events industry, specifically conferences, which provides a justification for this study.

A study by Brennan and Croft (2012) investigates how extensively business-to-business marketers are using social media, specifically the information technology industry, although not the technology event industry. The primary research therefore addresses the extent to which event marketers are using social media in the technology industry. Furthermore, Hede and Kellet (2012) explore the Australian tourism sector, specifically events, and how they are using social media in marketing campaigns to build brand communities online. The study concludes with the importance of investigating the impact of social media for event marketing (Hede and Kellet 2012). This provides a justification for discovering the effects of social media on event marketing communications and how extensively it is used in the technology events industry.

3 Research Design

The purpose of this research is primarily to discover how social media effectiveness is measured in the technology events industry, this presents a 'how' question, endorsing the appropriateness of a case study approach (Yin 2003). Starting from the general purpose of the research, it is possible to outline the following research objectives:

1. To explore the effects of social media on marketing communications in the technology events industry.
2. To understand whether event companies and brands are employing consumer centric social media marketing strategies.
3. To evaluate how event companies and brands are measuring social media in their marketing campaigns.
4. To discover how extensively social media is used in the technology events industry and what channels are utilized during and after an event.

An exploratory approach is taken whereby the aim of the research is to describe and ascertain what is happening in a particular area (Veal 2006). A multi-case study approach is used because this allows a wider variety of data to be collected whilst also enabling cross-case analysis, where each case is analysed and it is determined whether a generalization can be made from commonalities and differences in each case (Collis and Hussey 2003; Saunders et al. 2009). This approach is also incorporated in a study conducted by Hede and Kellet (2012) on how social media is used to build brand communities, therefore providing a further justification for this method. In a research study where resources may be limited and large quantities of data are unable to be collected, a case study approach can provide a solution because only a small amount of cases are collected (Veal 2006). Qualitative research is the main research technique because for this study it is important to gain a greater understanding of the participants and why they have made certain choices (Saunders et al. 2009). The data is collected through in-depth, semi-structured interviews, which Saunders et al. (2009) confirm is a common research combination.

In addition, in-depth interviews are used in a qualitative social media study by Hede and Kellet (2012), providing a further justification for why this technique has been selected. Furthermore, the use of in-depth interviews to collect data allows a deeper understanding to be established whilst also providing flexibility and, through the use of probing, unknown issues can be discovered (Nykiel 2007). Semi-structured interviews are noted by Gillham (2000) as the most significant for research using the case study method hence they were used for this study. Semi-structured interviews allow pre-determined questions to be asked with the chance for the participant to elaborate and potentially take the interview in another direction (Fisher 2007; Saunders et al. 2009; Wilson 2010). Using this particular technique means each interview is flexible, has a unique element (Gillham 2000),

Table 1 Case study and participants key

Company	Participant (P)	Function
A	P1	Digital media marketing manager
B	P2	Marketing coordinator
	P3	Senior conference manager
C	P4	Social media assistant
	P5	Marketing director
	P6	President

whilst also ensuring the essential questions are asked and thus data collected (Krishnaswami and Satyaprasad 2010).

Each case study is chosen for a specific criterion: technology related companies or brands that organise and manage technology based events. The selection is made by convenience sampling; however this limited the ability to generalize findings (Bryman 2008). An overview of how each case study and participants will be referred to from hereon in is illustrated below in Table 1.

Company A is an international firm that uses events as training strategy to deliver business information to the technology industry; aside from events, company A provides media solutions and marketing services. Company B delivers event series, which focuses on search engines marketing and social media marketing. The events are held across a number of global locations, such as Singapore, New York and San Francisco. Company B events are addressed to individuals from the technology industry, such as technology officers, IT manager and eMarketing executives. Company C organizes a series of events about technologies and tourism across the world addressed to the tourism industry (IT managers, marketing managers etc.). Company C main mission is to facilitate the "IT and tourism" community to come together to co-create and understand the impacts of Information and Communication Technologies (ICT) in the travel and tourism industry.

3.1 Data Collection

For this research, half of the participants are located overseas and therefore it was not logically possible to conduct face-to-face interviews. Although face-to-face interviews provide an increased strength of communication (Gillham 2000), the use of telephone interviews became necessary as distance, cost and time (Saunders et al. 2009) were found to be an issue due to the location of participants. Three out of six participants are located in the United States of America; therefore in order to considerably reduce costs Skype was used to converse with the participants over the internet (Cohen et al. 2007). Additionally, the use of a Voice over Internet Protocol (VoIP) such as Skype meant the data was collected in a quick and

straightforward manner (Bertrand and Bourdeau 2010), whilst also overcoming the issue of location (Cohen et al. 2007).

Furthermore, the interviews were recorded, with participant consent; the reasons for this being the ability of the researcher to completely focus on the participant and the answers being given (Gillham 2000), a record to prove unbiased and accurate data was collected and direct quotes could be used (Saunders et al. 2009). Despite this, participants may be less inclined to answer questions, thus reducing reliability (Saunders et al. 2009). Additional limitations include the chance of technical difficulties and the time consumption of transcribing data (Saunders et al. 2009), however in order to ensure technical difficulties did not occur, an equipment test was carried out so that the researcher was fully aware of how the recorder worked.

3.2 Data Analysis

Recorded interviews have been transcribed and analysed. Subsequent to reading the transcripts, the data was categorised, also known as coding the data, where the codes were created around the original research objectives (Saunders et al. 2009) and themes which occurred in the data (Dawson 2002). An inductive approach was taken when the data was analysed, known as emergent coding, this is where categories are chosen as the interview transcripts are analysed (Nykiel 2007; Wilson 2010). Once the codes were formed, various parts of the data were allocated to these different codes (Saunders et al. 2009), resulting in a more straightforward interpretation of the data. Codes referred to the following topics: Communication Process, Effects of Social Media, Social Media Marketing, Measuring Social Media and Social Media in Events.

4 Results

The following section aims to present the key findings from the research, which are the effects of social media, measures of social media marketing and social media usage.

4.1 Effects of Social Media

Since using social media all case studies found a significant increase in the level of engagement and interaction, as one participant said:

> We saw an increase of almost thirty percent of new followers through Twitter… from our campaign compared to twenty-eleven (P1A).

Case study B particularly noticed a dramatic change in Twitter followers and therefore the number of people they connect with as P3 said:

> On Twitter we used to have like eight thousand followers and we just actually this week hit the twenty thousand mark.

P5 from case study C said how the "…level of communication, engagement, response they were … huge increase and really obvious", since using social media. It is therefore apparent all case studies are experiencing an increase in the number of people they connect with since using social media, supporting Safko and Brake (2009) who highlight the vast connection ability of social media.

4.2 Measuring Social Media Marketing

The findings interestingly highlight various measurement techniques for each case study. For case study A, P1 is the only marketing manager; therefore resources are limited and so are the tools to measure social media; however they does measure the community engagement and growth of the community. This is measured through "how many 'likes', how many people have shared things…how many people have retweeted", in addition P1adds:

> One thing I do is…I always measure is…the website traffic…that each…social channel generates to our website.

Similarly, case study B uses Google Analytics to measure conversion rates, as P2 said:

> We use Google analytics so we track a lot of the like…the…we put links on like Twitter or Facebook, we put in tracking URL's and then on the back end look at Google analytics.

Murdough (2009) argues that marketers should focus on the customer engagement generated from social media efforts; therefore supporting the literature and providing evidence to show that this is a strategy a company and brand in the technology events industry are undertaking.

In comparison to case study A, case study C is measuring similar elements to gauge the engagement and awareness of social media, such as 'likes' and retweets, as P6 said:

> If someone has 'liked' something so many times you assume immediately that you understand that this is something that they do… if they retweet.

In contrast case study B focuses on conversion rates, how social media contributes to the conversion of a consumer to sign up to newsletters, email subscriptions or a paying attendee. P3 said, "…conversion's the key. So I don't think, we don't officially measure customer engagement", whilst adding to this further saying, "I think the hardest thing is quantifying engagement it's very difficult".

Additionally, P2 (B) highlights the brand also focuses on awareness saying, "I think it's about conversion and just awareness". Furthermore, the research shows that for case study B, senior management are interested in conversion rates and thus money, rather than the number of 'likes' and followers the brand has, as P3 (B) said:

> …no person on the management team is going to care here if we go on about the fact that we got twenty thousand followers, it's a nice number to say…but all they are going to be like is yes but how many did you convert.

Whilst P3 (B) subsequently highlighted, "she's just going to care about the money". Case study B and C therefore share similarities in that both understand how the number of Facebook 'likes' or Twitter followers are not the most significant metrics available. Additionally case study B reveals the importance of conversion rates and money when showing senior management the effectiveness of social media. These findings are absent from the literature, therefore this primary research provides insight and new knowledge to the current secondary research in this area.

The findings further reveal that all three case studies are not currently using elements from either the Engagement Pyramid (Li 2010) or the Community Engagement Framework (Powell et al. 2011), such as splitting customers up into different levels of engagement.

For case study A, this was not a strategy that was employed due to resources, as P1 said, "so we don't really differentiate the audience right now" whilst further stating, "we're just limited on resources, but that's one of the things we definitely want to focus on more". Case study B on the other hand, do take into account Twitter followers, people who have attended their events, people who subscribe and those that join in conversations. From these findings for case study B, it seems some of these elements mentioned are found in the Community Engagement Funnel (Powel et al. 2011), for example, measuring engagement through the conversations occurring, consumption of content and subscription (Powel et al. 2011).

Despite this, P2 (B) highlights that as a brand they do not openly differentiate consumers into levels:

> We don't split it just because a lot of them might be able to go into all three…so we kinda want rather than splitting we kinda want it to be an enriching community.

Furthermore for cases study C, the findings also show that they do not allocate consumers into various engagement levels, as P5 said: "I wouldn't say at the moment it's so sophisticated that we would split it". However, a subsequent interview participant from case study C explained how they are planning to split the consumers into various stages:

> I'm gonna group them up in like generally said heavy, light and no user but then a bit more groups probably like a wider audience (P4C).

The literature puts forward these two models to aid marketers with measuring social media engagement, such as allocating consumers into levels of engagement. Whilst the findings reveal that in practice these models are not being applied in industry, nonetheless it is unquestionably something that all case studies said would be a useful tool to employ in the future. This research provides new knowledge on the applicability of these models to the technology events industry.

4.3 Social Media Usage

The findings reveal that two out of the three case studies are using social media extensively, these being case study B and C. P3 from case study B said:

> Yeah, thirty percent cos it's quite, it's high for us but it's not, you know, it's not where we base everything around.

Similarly, case study C stated that they are extensively using social media and when asked to put a percentage on it P5 said, "forty to fifty I would say". In contrast to these two case studies, P1 from case study A highlights how social media is not extensively used:

> Right now it is just kinda a drop in the bucket, but you know… we… I'm trying to let the senior level people know that it's… very important.

The findings from case study B and C both support the literature which states that over the last few years event producers are now using one or more social media platforms, this increase has been from 30 to 90 % (Hughes 2012). Furthermore, it is interesting to see that P1 from case study A highlights that they are trying to persuade senior members of the company to understand the importance of social media. Whereas P3 from case study B notes that they are fortunate enough to have senior management on board:

> We are lucky over here because our MD is really social and he's a marketing guy deep down… and he's, you know massively into social media so we don't have to… convince him of the sort of… need to use it.

The literature suggests marketers focus on consumer investments, such as their motivation to use social media (Hoffman and Fodor 2010; Moran and Gossieaux 2010) and to use frameworks such as the Engagement Pyramid (Li 2010) to measure engagement levels. However, these findings suggest management commitment, which starts with understanding, has a strong emphasis on the extent companies and brands employ social media in the first place. No reference is made to the importance of management commitment in the literature; therefore this primary research provides added knowledge about social media usage in the technology events industry, enhancing existing secondary research.

5 Conclusion

The three case studies presented in the research are bodies that organize and manage technology-based events and therefore they can be seen as forerunners in the use of technologies (and in particularly social media) in events promotion. Given the nature of these organizations a formal social media strategy related to marketing communications, consumer centred marketing and measurement was expected due to the vast academic and professional literature present on the topic. Actually what emerges from the research is a lack of strategy and direction for what concerns events companies in all these areas.

The key findings related to objective 1 reveal that there has been an increase in interactivity with customers in all three case studies investigated since using social media. Furthermore, it seems that there has been an increase in the level of customer engagement, with customers becoming increasingly active and connected since using social media. Thus the effects of social media have been positive on companies and brands, using this in their marketing communications.

In relation to objective 2, the literature focuses strongly on centring marketing strategies on the needs of the consumer, however; the findings show that the three case studies are employing different strategies. From two of the case studies, the findings suggest that some in the technology events companies are early adopters in understanding the value of being customer orientated. Due to the nature of the technology industry, social media is a natural platform for the case study communities to utilize; however the findings reveal strategies are not explicitly consumer centric, concluding that at present this is not a strategy overtly employed.

The findings for objective 3 suggest tangible measures such as conversion rates are important when explaining social media's effectiveness to senior management. From this, it is concluded that by using tangible measures such as conversion rates to measure social media effectiveness, event marketers will more likely be able to persuade senior management of social media's value. Additionally, from the application of two engagement frameworks, the findings indicate that although the formality of a framework is not currently being employed, it was a consensus that this more structured approach would be useful to measure social media engagement in the future. Therefore, the conclusion is that the application of these frameworks should be more widely understood and adopted by event marketers when measuring social media engagement.

From the findings in relation to objective 4, it seems the extent to which social media is used depends on senior management's commitment to social media which is largely a function of knowledge and understanding. This finding is absent from the literature therefore one concludes that a higher emphasis on the commitment of senior management is required.

Therefore, it is possible to conclude that: (1) companies and brands in the technology events industry should use social media because it is an accepted and expected communication tool, which can increase their customer reach, connection ability and events awareness; (2) organizations in this field should move from a

traditional way of measure the effectiveness of social media (i.e. likes or retweets) to use both the concept and the models related to engagement and/or influence as a way to measure social media impact; furthermore, (3) looking at financial returns, events organizations, should measure conversation rates of social media (for example enabling Google Analytics tracking). Lastly, (4) it is relevant to note the importance of the senior management endorsement within the activities related with social media: case studies demonstrated that the more top management is committed with social media, the more possibilities of fully exploiting their potential and measuring their influence.

Due to the nature and organization of the study, results are not generalizable but shed lights on one under investigated topic that is the one related to the use of social media in the event industry. The vast amount of literature that underpins the study often refers to the use of social media in marketing and promoting goods and/or tangible products. As claimed by Hede and Kellet (2012) more research is needed to study possible social media applications and impacts in the context of event industry, which sells and creates intangible goods.

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Investigating Social Media Marketing in the Hospitality Industry: Facebook and European Hotels

Roberta Minazzi and Stefan Lagrosen

Abstract Social media have changed the way people interact with each other and with companies. In fact, recent research confirms that user-generated content is a key element in the decision-making process of customers who travel. The hotel business is now taking advantage of the introduction of social media into their marketing programmes, trying to create a customized relationship with consumers. The aim of this study is to investigate the use of social media among European hotels. Quantitative and qualitative research methods have been combined to identify a group of items useful to comprehend how hotels interact with customers on social media. The results show that European hotels are still in the first stages of developing social media strategies that present a moderate level of integration among different media. They are considered a useful instrument to promote the hotel brand but the potentiality of customer engagement is still undervalued.

Keywords Social media · Facebook · Hospitality · Hotels

1 Introduction

The influence of social media on purchasing decisions is growing across all regions around the world (Nielsen 2012a), changing customers' behaviour (Leung et al. 2013). Recent research shows that nearly 70 % of customers look at the experiences of other consumers before purchasing a product (Nielsen 2012b).

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Modern consumers are more demanding and willing advocates for the brands they love. They are looking for engaging experiences with other customers and with brands. Social media give marketers this opportunity and are becoming an important channel for customer care (Nielsen 2012b).

The proliferation of social media sites is a phenomenon, even if Facebook and Twitter continue to be the most popular social networks (PhoCusWright 2012). Facebook especially is the most used social network for number of visitors and total minutes spent, and for "social care", also in comparison with the rest of the web (PhoCusWright 2012). Moreover, the proliferation of mobile devices, used more and more to access social media (PhoCusWright 2013), is further changing customers' habits. In fact, with widespread connectivity, consumers have more freedom to use social media wherever and whenever they want (Nielsen 2012b). The future trend for social media marketing will move from the current brand marketing to conversions and sales (PhocusWright 2012). Even if at present social media are mainly marketing and communication tools rather than separate retail channels (PwC 2013), engaging customers by means of social media could increase customer loyalty and electronic word of mouth (Litvin et al. 2008), and consequently have important effects on corporate sales and revenues (Dellarocas 2003; Chevalier and Mayzlin 2006; Dellarocas and Zhang 2007). These changes affect, in particular, the tourism and travel sector where social media are widely adopted by travellers to gather information, plan their travel, decide where to stay, purchase and share experiences (Buhalis and Law 2008; Cox et al. 2009; Gretzel and Yoo 2008; O'Connor 2008; Xiang and Gretzel 2010; Inversini et al. 2010; Anderson 2012; Yoo and Gretzel 2012; Leung et al. 2013; Mauri and Minazzi 2013).

Considering these trends and, consequently, the even more significant power to drive conversations with companies that social media give to customers, it is becoming more and more important to synchronize companies with "social" consumers' expectations (Minazzi 2012). Travel companies should therefore understand the appropriate ways to use social media and the key elements of a successful integrated marketing strategy.

This study seeks to understand how widespread the use of social media is in the hotel business. The aim of the study is twofold: on the one hand to explore how top European hotel companies employ social networks and understand the dimensions that influence their use, and on the other hand to identify which are the ways used by hotel brands to interact with customers by means of social networks, identifying best practices in the hotel business. The paper is divided into three parts. The first part provides a literature review of the topic of social media in hospitality and identifies research questions. In the second part, the research methodology is described. In the third part, the results of the analysis are discussed and managerial implications are considered.

2 Theoretical Framework

The development of social media can have various impacts on hospitality management; some of them could be an opportunity that a company should catch while some others could be threats that a company has to face. As a result, many hotels are insecure regarding their use of social media (Lagrosen and Josefsson 2011). The creation of a direct relationship with customers by means of social media could generate the following benefits for a hotel company:

- Improving customer knowledge and segmentation with consequent appropriate product differentiation (Lovett 2011).
- Increasing and stimulating room sales through a direct relationship between the social media page and the booking engine of the hotel website (Christou and Nella 2012).
- Decreasing the amount of commission to be paid to online travel agencies (OTAs) and other costs of distribution (Noone et al. 2011), giving back, at least partially, to the hotel control of its distribution decisions.
- Giving the possibility to increase hotel rates if able to achieve good social media metrics (TripAdvisor ranking, etc.) that can be considered indicators of quality.
- Giving the opportunity to increase word of mouth (Godes and Mayzlin 2004; Godes and Mayzlin 2009).

On the other hand, "social media metrics", which quantify interactions between brands, customers and other consumers, further complicate the comparison with competitors (Lovett 2011). Moreover, pricing transparency and dynamism generated by the development of IT and social media could force a company to continuously and dynamically align its rates to those of its competitors.

Therefore, considering these opportunities and threats, which are the antecedents that lead hotel companies to adopt Web 2.0 strategies? A first stream of research noted that an antecedent of IT usage by hotel companies is brand affiliation. Therefore, hotels belonging to a hotel chain are more likely to adopt and develop web technologies than independent hotels (Wang and Qualls 2007; Scaglione et al. 2005). This is not only caused by the greater financial or human resources available for hotel chains, but may also depend on hotel managers' perception of the benefits that these instruments can realize for a company (Leung et al. 2011). As social media is often seen as a way of strengthening a company's brand (Lagrosen and Josefsson 2011), it is logical that hotels with more focus on their brands should be more eager to use social media. Moreover, hotel managers rarely integrate IT into their company's business strategy because they generally consider it only as an instrument to reach customers (Law and Jogaratnam 2005; Law et al. 2008). Another stream of research studied how IT (mainly the websites) is used by hotels to interact with customers. The main finding of these studies is the existing connection between a company's dimensions (size) and its development of online strategies and interactions (Sigala 2001; Gilbert and Powell-Perry 2002; Bai et al. 2006; Romenti et al. 2011). Smaller companies sometimes use web

solutions in creative and more personalised ways (Lagrosen 2005). Other studies were mainly focused on the connection between a company's quality level and their adoption of IT and the orientation of their website towards online interactions. However, in this case the results show conflicting positions: some scholars confirm the relationship between the quality level and the website development (Scaglione et al. 2005) and its relationship orientation (Sigala 2001; Schegg et al. 2002; Romenti et al. 2011) while others found that sometimes budget hotels demonstrate greater interest in creating online customer relationships (Essawy 2005).

Therefore, it could be interesting to address the following research objectives, concentrating on social media rather than on general IT use:

- To explore how top European hotels brands use social media strategically;
- To understand which are the factors that influence the use of social media in European hotels;
- To explore the level of integration among social media and the the website;
- To study the social media posts published by the hotel brand (quantity and content analysis).

3 Research Methodology

In light of the results of the literature review, this paper will especially address the study towards the use of social media by top European hotels. This could be considered a pilot study aimed at verifying the methodology before its application to a larger number of cases of international hotel companies. Moreover, it could be useful to the development of future hypotheses of research on the topic.

Research methodology combines quantitative and qualitative research methods. A group of items has been developed to explore how hotels interact with customers by means of social media. The study was conducted in the period March–April 2013 and followed two steps: the first step consisted of processing items as a result of various semi-structured interviews with head managers of international hotel chains; the second step was concerned with the analysis of the Facebook pages of 15 top European hotel groups brands by means of the items identified. The hotel brands were selected from the ranking of the top ten European hotel groups. Analysing the website of each single hotel group, we first made an inventory of the existing hotel brands for each group. This first selection was then compared with the world ranking of the top 50 hotel brands. Only the ones that were present in this ranking were included in the third step of selection, which also excluded other companies, that considered the following features: hotel brands that have a Facebook page but only connected to a single event; hotel brands that are not present in the European countries; hotel brands that mainly offer an extended-stay service.

The Facebook pages of European hotel brands were analysed by means of 14 items that can be grouped into five categories: accessibility, information, call to action, connections and performance. The first aspect, "accessibility", is analysed in questions 1–4: is it easy to find the Facebook page of the hotel brand by searching via Facebook's search engine? (question 1); is there a connection to the website of the hotel brand and also from the website of the hotel brand? (questions 2–4). The second issue, "Information", concerns the study of the kinds of information included on the Facebook page (questions 5, 5.1). "Call to action" is analysed by verifying whether it is possible to check availability and rates directly on the Facebook page (question 6). The section "connections" refers to the possibility for users to connect to a company's profile on other social media (TripAdvisor, Twitter, YouTube, etc.) and to their mobile application (app) (questions 7, 7.1, 8). "Performance" is measured by means of the following counting metrics (Lovett 2011): number of "likes", number of people "talking about this" and number of people that "were here" (questions 9–11). Hotel brand posts are analysed in questions 12–14, which have the objective of quantifying the number of posts published by the brand in 2012, studying their frequency during the year. Is there a continuous relationship with the customer or the posts are mainly connected to events concentrated in certain specific periods of the year? Finally, a content analysis of all the posts published in 2012 is undertaken on the basis of the items included in question 14 (from 14.1 to 14.25), aimed at quantifying the number of posts for each content category. The list of categories has been adapted to the case of the hotel business from a study of Hays et al. (2012), which analysed the use of Facebook and Twitter by destination management organizations.

4 Results and Discussion

4.1 Counting Metrics

The list of 15 brands selected are here analysed through trying to answer the research questions set in the first part of this paper. Table 1 shows the Facebook statistics gathered during the analysis. Holiday Inn and Intercontinental Hotels and Resorts are early adopters of Facebook (2008). The longevity of the Facebook page does not necessarily seem to influence the number of "likes" and the number of people "talking about this". Moreover, the date of creating a Facebook page does not seem to depend on the size and the quality level of the hotel brand. However, we found that the top five hotel brands when considering the metric "talking about this" have all been Facebook members since 2009. This could be a hint of a possible relationship between longevity and the community level of activity (people talking about this).

Hilton Hotels and Resorts and Best Western are the hotel brands with the highest metrics when considering both the number of "likes" and of people

Table 1 Hotel brands' Facebook statistics (order according to the world ranking)

Brand (FB year)	Rank/ quality[a]	No. rooms 2012	Likes	Talking about this	Were here	No. posts	Activity index (%)
Best Western (2009)	1/M	311,894	687,308	25,837	59,294	565	3.76
Holiday Inn (2008)	2/M	225,328	452,395	5,092	N/A	354	1.13
Holiday Inn Express (2012)	4/E	196,666	23,238	536	N/A	23	2.31
Hilton Hotels and Resorts (2009)	5/U	196,151	1,010,608	11,817	4,621,541	182	1.17
Hampton (2009)	6/M	181,087	312,754	13,107	N/A	484	4.19
Ibis Hotels (2011)	15/E	113,077	103,308	1,235	176,024	152	1.20
Crowne Plaza (2011)	16/U	105,104	80,440	936	N/A	249	1.16
Radisson (2011)	20/M	94,436	77,159	545	N/A	371	0.71
Novotel (2012)	24/M	74,117	38,010	489	236,298	104	1.29
DoubleTree (2009)	27/U	70,793	203,655	5,320	686,754	336	2.61
IHG (2008)	32/U	57,598	38,654	493	N/A	69	1.28
NH Hoteles (2010)	35/M	51,898	34,662	247	1,697	623	0.71
Premier Inn (2010)	38/M	48,725	67,602	650	N/A	136	0.96
Riu Hotels and Resorts (2009)	44/U	39,823	271,445	6,139	N/A	199	2.26
Melia Hotels and Resorts (2010)	47/U	34,324	227,261	1,623	52,213	134	0.71

[a] World Rank/quality level: *U* upscale, *M* Mid-range, *E* economy

The date close to the name of the hotel brand represents the year of first publication of the Facebook page. N/A means "not available"

"talking about this". Already in the first two positions of the ranking we notice that the number of "likes" and the number of people "talking about this" often do not correspond but that a high gap is generally present. In fact, Hilton, for example, which is the first brand for number of "likes" (more than 1 million), moves from first to third position if we consider the number of people "talking about this" (11,817). There are a lot of people who like the page but who then do not interact with it. Hampton, Best Western and DoubleTree are the hotel brands that present the highest "index of activity" (people talking about this/likes). On the contrary, NH Hoteles, for example, has 34,662 "like" but only 247 people interacting with its Facebook page. This confirms that the number of "likes" (previously "fans") is probably not the most suitable metric to evaluate the success of a corporate Facebook page (O'Neill 2011). The "like" option is more related to a single initial action whereas "talking about this" is an indicator that can actually measure people who interact with a Facebook page (posts, comments, shares, post likes, etc.) and actively participate in the "life" of the page. It can really express the community volume of activity. We also see in Table 1 that counting metrics seem unconnected with the quality level and the size of the hotel brand. In particular, if we concentrate on the number of people "talking about this", which in

our approach is considered the most appropriate metric to measure the level of interaction created with users on a Facebook page, we notice that the top five is composed of very different hotel brands, considering their size, quality level, hotel group, geographical origin of the company and even the brand strategy used (unique brand/multi-branding). Therefore, regarding the debate in research as to whether there is a relationship between quality level and website interactivity, as proposed by Scaglione et al. (2005), our study does not confirm such a relationship. Neither does it support the findings of Essawy (2005) that budget hotels are more effective in creating social media interaction. In addition, the connection between brand affiliation and social media activity seen in some earlier studies (Wang and Qualls 2007; Scaglione et al. 2005) was not seen in our results. Rather, we found no relationship between social media interactivity and quality level, size or brand affiliation. It is probable that more organizational and/or personal factors determine the level of commitment to social media marketing. This is something that should be explored in further in-depth studies.

Shifting to the third metric "were here", only 45. 8 % of brands display this metric on their Facebook page. This could depend on what kind of Facebook page they are using. Among the hotel brands analysed, the one that presents the highest number of people using mobile devices to check in at a the place are Hilton, DoubleTree and Novotel. In these cases, the number of people who "were here" is sometimes four or five times greater than the number of "likes", demonstrating the importance of these new devices in the hotel sector. Furthermore, this could be an indicator of customer loyalty. For example, in Foursquare if you check in at the same place/company you become a frequent user and obtain more points, not considering the continuous and free word of mouth generated towards your friends and other people who are not in the same place.

Finally, it is useful to consider the number of posts. We focused on the posts published in 2012 for each month. Our results showed that the total amount of posts does not influence the number of "likes" and people "talking about this". In fact, hotel brands presenting the highest number of posts published on their Facebook page often do not excel in other counting metrics. For example, NH Hoteles published more than 600 posts during 2012 but does not hold first position in the rankings for the number of "likes" and people "talking about this". This could underline the importance of a post's content rather than the quantity. In fact, in the case of Hilton, which has first position for the number of "likes" and third for the number of people "talking about this", we found a lower number of posts published in comparison with other brands.

4.2 Facebook Page Features

The results of questions 1–4 give us information about "accessibility". All the Facebook pages of the hotel brands analysed can be easily found in the first seven results of Facebook's search box. In almost all the cases, there is a clear

connection from a hotel's Facebook page to its brand website and, conversely, from a hotel's website to its Facebook page. Nearly 27 % of the hotel brands' Facebook pages also have a connection to the company's loyalty scheme.

Concerning the questions on "information", hotel brands' Facebook pages give general information describing the hotel brand (86.6 %), the mission (60 %) and the brand history (86.6 %). Only 40 % of the hotel brands analysed give users information about corporate contacts (telephone number, email, Skype, etc.). This may be because the connection is created directly on their Facebook page.

"Call to action" was investigated by assessing the presence or not of the "book now" function on the FB page: 80 % of the brands analysed offer this function. This propensity to recognize a Facebook page as a channel that can increase sales could be a great opportunity for hotel companies to overcome OTAs, thus decreasing the amount of commissions to be paid.

Questions 7 and 8 aimed to study the level of "connection" of the Facebook page with other social media. Only 33 % of the brands do not have connections with other social media. They are generally brands that present a low level of interaction with customers on their Facebook pages (low number of people "talking about this"). In the case of Holiday Inn Express, this could be because of its recent opening of its Facebook page in 2012, compared with other brands. Considering only the brands studied that present a connection with other social media, the most commonly used are Twitter (53 %) and YouTube (46.7 %). Only three brands also have a connection with Pinterest, which is the fastest developing social media according to recent statistics (Nielsen 2012b). Hilton, DoubleTree and Riu Hotels and Resorts are some of the brands that use the highest number of social media. NH Hoteles is mainly focused on video (YouTube) and pictures (Flickr, Pinterest). None of the Facebook pages studied has a connection with Google+ or TripAdvisor, in the last case probably because the study is focused on the Facebook page of the brand as a whole (the global corporate page), whereas TripAdvisor contains the reviews of customers of single hotels. Of the 15 brands analysed, 86 % have a mobile application but only 20 % promote it with a specific link on their Facebook page. Only two hotel chains (Riu Hotels and Resorts and Premier Inn) do not have a mobile application. Therefore, the hotel companies researched realize the potential of mobile technologies and applications but only a few manage it in integration with other social media. These last two results related to "connection" seem to indicate that the majority of hotel chains are in the first stages of developing an integrated social media strategy that so far has mainly focused on Facebook.

4.3 Hotels' Posting Frequency and Content Analysis

The last part of the study had the objective of analysing the frequency and the content of hotel brands' posts. Our starting point was to count the number of posts published in 2012 for each month, as a way to understand whether a Facebook

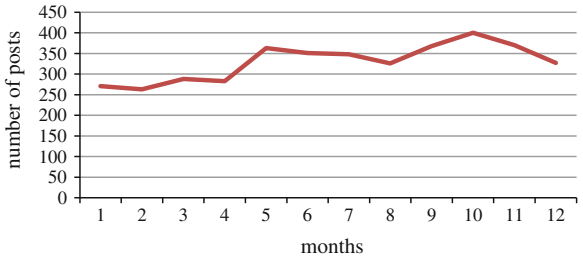

Fig. 1 Combined frequency of posts during 2012

page is managed continuously. As shown in Fig. 1, if we consider the brands selected in this study (excluding Holiday Inn Express, which opened its page in 2012 and started publishing posts that October), we notice that there is a relatively stable pattern, with an increase during the spring and summer seasons. However, obviously, observing the pattern of each brand we found differences. For example, the brands with the most stable patterns, i.e. a balance in the distribution of posts during the year, are Holiday Inn, Crowne Plaza, Novotel and Melià Hotels and Resorts. On the contrary, other brands present a two or even three-peak pattern. DoubleTree and Best Western show the most irregular patterns. Therefore, if we look again at Table 1, our study does not find a connection between counting indicators and posting frequency and seasonality. Namely, brands with very high metrics ("likes" and "people talking about this") do not always present continuous management of their Facebook page throughout the year (i.e. Best Western, Double Tree). On the contrary, other brands with fewer "likes" and people "talking about this" present more balanced patterns.

Moving to the content analysis of the posts published in 2012 by the hotel brands investigated (Fig. 2), we found that only 5 % of posts give advice or comment on something (different to a specific hotel of the brand) and 60. 4 % of the posts include a link to another website (sometimes also the company website). This could be annoying for users who generally want to remain on Facebook interacting with friends and the brand. Moreover, these results could be a signal of the time the hotel brands spend implementing and managing post content. Obviously, it is easier to publish posts with a title, maybe a picture and then a link, but it is not what social media users generally appreciate. Moving people to another website interrupts their interaction with users and, consequently, the opportunity of engagement. Pictures (photos) are the preferred content included in posts (55 %) and nearly 48 % are promotion-related. Among them, hotel brands particularly promote specific hotels (29 %) and destinations (28 %). Only 16 % of posts are contest-related. In fact, observing posts, the impression is that the majority come from the hotel brand itself, rather than from users, and that mainly pictures are used to promote a chain's hotels. This behaviour is more similar to traditional marketing than social media marketing and does not exploit the opportunity provided by social networks. Moreover, the focus is often on the promotion of the hotel's structures, internal services and events rather than the integrated mix of services offered by the destinations. A greater use of information about destinations, such as attractions,

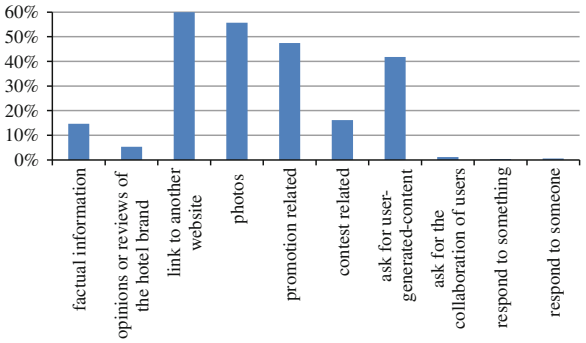

Fig. 2 Post content

events, traditions, culture, etc., could help hotel companies to find valuable content more easily for customers on Facebook.

Questions 14.8–14.25 studied the level of interaction with users. Here, 42 % of posts ask for user-generated content, especially to answer a question and to give an opinion (92 %), for example, asking users which picture they prefer, etc. The other items connected with interaction are generally undervalued. In fact, only 1 % of posts ask users to collaborate (different to giving their opinion), such as, for example, asking them to help the company create a slogan or similar. Moreover, only 1 % of hotel brands respond in the posts to something or to someone.

5 Conclusions

The objective of this paper was to understand how widespread the use of social media is in the hotel business. In particular we focused on the case of some leading European hotel brands, analysing the strategies used on their Facebook pages. The study confirms that in the hotel sector Facebook is the most used social media. It is considered an instrument to promote the hotel brands and create sales, as demonstrated by the content analysis and the presence of the "book now" function in almost all the brands analysed. Their attempt is to convert social networking and sharing among customers into sales (Kaplan and Haenlein 2010; Dellarocas 2003). What has so far been undervalued is the potentiality of engagement that could increase customer loyalty, electronic word of mouth and ultimately sales. Sometimes the hotel brands themselves move users' attention away from their Facebook page by high use of links to other websites. This could be easier from a page management point of view (less time spent on the creation of content) but could also interrupt interaction and annoy users, whose habit is to interact directly on the Facebook page. The content analysis also confirms a high propensity to use posts to promote the hotels or the destinations where they are located and a low concentration on potentiality offered by interactions with users.

From the side of social counting metrics the findings seem to confirm our initial approach, which considers people "talking about this" to be a better metric in comparison with the number of "likes". In fact, the first indicator could be more suitable for measuring people who actually interact with the Facebook page (posts, comments, shares, post likes, etc.) and actively participate in the "life" of the page. Facebook metrics do not seem to be connected to a company's size and quality level.

Another interesting result worthy of comment is the moderate level of connection with other social media. Despite the actual trend being the development of new devices (smartphones, tablets, etc.) along with increased connectivity, hotel brands do not seem to be latching on to the importance of this phenomenon. To be precise, a large majority of the hotel brands analysed have a mobile application but this is not properly promoted on their Facebook page or even sometimes on their website. It seems they are considered as separate rather than an integrated tool for a coordinated strategy. This could simply mean the gradual development of a social media strategy that is already in its first stages and that presents a moderate level of integration.

From the perspective of implications for management, hotel brands could develop strategies aimed at creating more interaction with users through replying to their posts and asking for their collaboration and experience. This could create a higher level of engagement that could influence customer loyalty, word of mouth and sales. Therefore, hotel brands should develop an integrated communication strategy that includes social media and traditional marketing, in alignment with the rest of their corporate strategies.

This study has some limitations. First, a more comprehensive analysis of social media usage by hotel brands could be developed, enlarging the sample and considering a wider period (more than one year). In particular, extending the period of observation could give interesting insights into the frequency patterns of posts. Second, the content analysis of posts is analysed here only following a combined approach. That means that results are not observed for each hotel brand. The next step of research could also consider the differences of content among various brands. Third, the frequency analysis of posts for each hotel brand could be studied in more depth to identify possible specific patterns. Fourth, the study mainly considers the social counting indicators from a customer perspective, that is, the metrics that the user can see on the Facebook page and that could influence their perception. It could be interesting to match these results with other metrics that are provided by Facebook Insights for companies. Finally, during the study we realized some adaptation was necessary to improve the analysis. For example, the wording and the order of questions could be changed slightly to facilitate the analysis and the connection among the questions. Future research could study post content in more depth to try to understand the level of interaction reached by the hotel brands. Other possible paths of research could investigate the relationship between the longevity of a Facebook page and the community level of activity (people talking about this), the possible interpretation of the indicator "were here", and possible antecedents of users' engagement. Are hotel brands with an "older" Facebook page more capable of interacting with users? Could people who check in at a place be considered loyal or potentially loyal customers?

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Strategic Use of Social Media Affordances for Marketing: A Case Study of Chinese DMOs

Jing Ge, Ulrike Gretzel and Rodney J. Clarke

Abstract Social media have become important platforms for tourism marketers but it is not clear if and how these organizations use social media to achieve particular strategic marketing goals. Given the enormous growth of both tourism and social media in China, this paper focuses on Weibo and its specific technological affordances. Using a case study methodology, it looks at five Chinese DMOs and analyses their Weibo activities in terms of correspondence to marketing communication elements and relation to specific technological affordances. The findings indicate that despite the opportunities for personal selling, DMOs do not fully capitalize on Weibo to achieve personal selling goals. Further, not all technological functions are used for strategic marketing purposes. Both theoretical and practical implications are discussed.

Keywords Social media marketing · Technology affordance · Weibo · Marketing communication · Destination marketing organization

1 Introduction

Social media's impact on tourists' decision-making processes, from travel intention identification, information search to sharing travel experiences, has been well established in the literature (Cox et al. 2009; Gretzel 2006; Pan et al. 2007;

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Yoo and Gretzel 2008). Given the prevalence of social media use among tourists, social media have become indispensable platforms for tourism marketers (Pantelidis 2010; Chan and Denizci 2011; Huang 2011; Munar 2010; Xiang and Gretzel 2010). Within tourism marketing, several studies have looked at the use of social media to achieve specific marketing goals, including enhancing the image of a business or destination (Leung et al. 2011; Pan et al. 2007; Sparks and Browning 2011), promoting products or services (Kasavana et al. 2010; Lanz et al. 2010), creating interactive conversations and building customer relationships (Pantelidis 2010; Schmallegger and Carson 2008). What is missing from the literature is a holistic marketing view of functions afforded by different social media platforms and an understanding of how these capabilities are or are not used by marketers to achieve certain marketing goals.

When discussing the importance of social media in tourism, China cannot be ignored. China's domestic and outbound tourism have both experiencing rapid growth. According to the National Bureau of Statistics of China (2013), by the end of 2012, the number of domestic tourists reached 2.96 billion, up 12.1 % over the previous year. As well, Chinese travelers spent $102 billion on overseas travel in 2012; more than tourists from any other country (UN World Travel Organization 2013). While preparing travel plans, an increasing number of Chinese tourists rely on social media platforms (Nelson 2013). By the end of 2012, Weibo gained over 500 million users, up by 50 % compared to the same period the previous year (China Internet Watch 2012). Weibo's great market penetration and high growth suggest tourism marketers should fully leverage its powerful functions in implementing marketing communication strategies. However, whether they really take advantage of the full range of functionalities offered by Weibo is not clear and is the focal question addressed in this paper.

2 Theoretical Background

2.1 Marketing Communication

Marketing Communication (MC) is described as a strategic marketing process that involves managing a variety of promotional mix elements to achieve different objectives (Kitchen 2005). The promotional mix elements typically listed in the literature are advertising, sales promotion, personal selling, and public relations. For the service industry, MC plays a strategic role in creating favorable consumer perceptions, attitudes, and behaviors (Keller 2001).

Advertising Advertising refers to a marketing effort that is used to attract, encourage and persuade consumers in order to drive their behavior with respect to a firm's offering (Pickton and Broderick 2005). The underlying goals of advertising include creating awareness, developing conviction and encouraging ordering (Elliott et al. 2012). In the tourism marketing literature, the aims of advertising are

Table 1 MC goals

Promotional mix elements	Marketing goals
Advertising	Attracting consumer attention
	Creating consumer interest
	Stimulating consumer desire
	Inspiring consumer actions
Sales promotion	Reaching more potential customers
	Driving immediate transactions
Personal selling	Identifying individual customer needs
	Providing customer support
	Creating the possibility for transactions
Public relations	Building well-regarded corporate image Generating favorable product publicity

often summarized with the AIDA principle; that is, attracting attention, creating interest, stimulating desire and inspiring action (Hollaway 2004).

Sales Promotion While advertising may be effective in creating tourists' awareness, it is also necessary to use sales promotion to convert tourist interest into sales (Hsu et al. 2008). Sales promotion refers to promotional methods using special short-term techniques to persuade consumers to respond to a firm's offerings (Pickton and Broderick 2005). Viewed as an 'attention getting' method, the prominent goals of sales promotion include attracting more customers and achieving immediate sales impact (Boone and Kurtz 2007). These specific goals are also identified in the tourism marketing literature (Hollaway 2004).

Personal Selling Personal selling can be defined as the interaction that takes place between a sales person and a potential customer for the purpose of making a sale (Van Heerden 2004). The goals of personal selling range from finding potential customers, convincing customers to buy and keeping customers satisfied (Pickton and Broderick 2005). Given that tourism is a people business, providing services to the satisfaction of customers is fundamental. To this end, the literature suggests that tourism marketers should use personal selling techniques to identify and satisfy customer needs and create opportunity for transactions (Hsu et al. 2008).

Public Relations Public relations is viewed as a set of strategies used to disseminate messages about products or the overall company image to customers, employees or other interested members of the community (Kitchen 2005). The primary goals of public relations are creating and maintaining the organization's reputation by presenting a favorable image (Elliott et al. 2012). Such active reputation management is especially important in the online domain, especially in tourism (Marchiori and Cantoni 2012). Table 1 summarizes the essential MC goals for each promotional mix element.

2.2 Technology Affordances

An affordance is a quality or aspect of an object that suggests how the object should be used to perform an action (Norman 2007). Similarly, it has been conceptualized as the mutuality of actor intentions and technology capabilities that provide the potential for a particular action (Faraj and Azad 2012; Leonardi 2011). Scholars have used the concept to explore ways in which social media technologies can be better designed (Zhao et al. 2013), while others used it to investigate how businesses use Web 2.0 technologies in performing different activities (Halpern and Gibbs 2013; Kietzmann et al. 2011). In this study, it can be interpreted as the technological capabilities of social media that support particular MC goals.

Herring (2007) has identified a number of generic technological aspects, which include synchronicity (whether the activity operates in real time or not), granularity (the nature of messages delivered by the system), persistence (the period of time messages remain on the system), multimedia channels, audience (whether messages are publicly or privately accessible), identity (whether messages are anonymous or identified), adaption (whether the system allows content to be filtered, quoted or modified) and format (the appearance of messages on screen). Consistent with Herring's work, Treem and Leonardi (2012) identified four technology affordances in the context of organizational use of social media: (1) visibility of users' online behavior, knowledge and preference; (2) persistent conversation that can be archived on the system; (3) edibility of the message; and, (4) established associations between individuals, and between individuals and content. Based on these four affordances, Majchrzak et al. (2012) has examined social media affordance in online knowledge sharing, and identified four affordances, including metavoicing (users' engagement in online conversation), triggered attending (a timely automated alert), network-informed associating (engagement of conversation informed by relational and content ties), and generative role-taking (taking roles to maintain online dialogue). While the forgoing discussion focused on social media in general, Kietzmann et al. (2011) examined functionalities specifically provided by Facebook, Twitter, LinkedIn and YouTube, and suggests seven functional building blocks: identity, conversations, sharing, presence, relationships, reputation, and groups. None of the existing typologies discussed social media affordances from a marketing perspective. Also, the existing literature suggests that technology affordances should be determined for the context of specific social media platforms. Therefore, this paper conceptualizes affordances specifically for Weibo with a social media marketing lens.

2.3 Technology Affordances of Weibo

First developed as China's answer to Twitter, Weibo has developed its own features that make it a unique marketing and communication proposition in China (Nooruddin and Zhang 2012). Popular marketing activities on Weibo involve lucky draws, polls, and asking consumers to create content (Gerring 2013). IResearch (2013) reports the most common ways in which consumers engage with brands on Weibo are forwarding, voting and tagging friends. It is important to note that Enterprise Weibo accounts have affordances that are distinct from personal accounts. Based on previous literature in the area but looking specifically at Enterprise Weibo accounts, this paper proposes five affordance dimensions: visibility, message format, reachable domain, metavoice, and informed association (Table 2).

Visibility Visibility is defined as the means and opportunities for presentation (Bregman and Haythornthwaite 2001). There are three options: (1) publicly accessible; (2) visible to all subscribers; (3) visible to one subscriber. As an open media platform, posts can be accessed by the general audience when they visit an enterprise Weibo page, no matter whether they follow the account or not. On the other hand, businesses can also push content to all followers/subscribers or specific followers/subscribers.

Message format Message format is defined as the appearance of the message on the screen (Herring 2007). Different message formats are possible on Weibo that allow marketers and consumers alike to overcome the 140 character message limit. Display advertising and videos as well as polls are distinctive functions exclusive to Enterprise Weibo pages.

Reachable domain Reachable domain refers to the alternative platforms by which posts can be delivered (Chowdhury et al. 2006; Davoust and Esfandiari 2009). Apart from posting on the Enterprise Weibo page, there are two options: (1) pushing content to subscribers' personal feed; (2) pushing content to one subscriber's message box.

Meta-voice Majchrzak et al. (2012) define metavoice as reacting online to others' presence, profiles, content and activities. Metavoice on Weibo refers to the ways in which individual users and tourism marketers can interact on the Enterprise Weibo page. The options include commenting, reposting, tagging and liking. Researchers have studied these specific functions on Facebook and Twitter from the individual user's perspective. For example, an individual may demonstrate support of another's comment when that individual reposts a message (Chen 2011), may react to others' content by promoting the content through a "Like" (Koroleva et al. 2011), or may react to others' content by adding tags that expand the application of an idea or document (Gray et al. 2011).

Table 2 Technology affordance of Weibo

Affordance dimension	Definition	Illustration in literature	Options on Weibo
Visibility	Mode of presentation	Bregman and Haythornthwaite (2001), Schondienst et al. (2011), Zhang et al. (2010), Zhao and Rosson (2009)	Publicly accessible; visible to all subscribers; visible to one subscriber
Message format	Appearance of the message on the screen	Herring (2007)	Text; embedded image; display ads; audio; video; animated graphs; emoticon; poll
Reachable domain	Platforms to which posts can be pushed	Chowdhury et al. (2006), Davoust and Esfandiari (2009)	Pushing content to subscriber's personal feed; pushing content to one subscriber's message box
Meta-voice	Interaction by reacting to others' online activities	Majchrzak et al. (2012), Chen (2011), Koroleva, et al. (2011), Gray et al. (2011)	Comment; repost; tag; like
Informed association	Established connections between individuals, between individuals and content, or between contents	Ehrlich and Shami (2010), Zhang et al. (2010), Majchrzak et al. (2012)	Hash tag; tag; favorite; like; following

Table 3 Selected DMOs

DMOs	Date established	Followers
Guangxi	September 2010	2,629,887
Shanghai	July 2010	904,047
Shandong	November 2010	1,627,565
Sichuan	December 2010	567,536
Zhejiang	January 2011	1,458,696

Informed-association This dimension refers to establishing connections between individuals, between individuals and content, or between content (Ehrlich and Shami 2010; Zhang et al. 2010). Marketers can use hashtags to classify the topic of a post and associate it with related contents, or tag individuals to show reuse of content or direct messages. It may also include associating with other accounts via "following".

3 Methodology

3.1 Sample

DMOs are tourism organizations specifically charged with promoting tourism at a specific destination. Connecting with consumers is especially important for DMOs (Gretzel et al. 2006), and social media provide an ideal platform for them to achieve this (Sigala 2009). In order to get a firm understanding of Chinese DMOs' Weibo marketing efforts, a case study of five provincial/autonomous DMOs was conducted (Table 3). First, on 11th July, 2013, one of the authors subscribed to all provincial and autonomous DMOs with a Weibo presence and carefully followed all activities for 2 weeks. The five selected DMOs were the most active and advanced users of Weibo and therefore represent the best cases.

3.2 Data Collection

Data collection took place 25th July–25th August, 2013. This involved checking the personal Weibo feed at least 3 times per day and visiting the DMOs Enterprise Weibo page once per day. In addition, to observe reactions, the researcher interacted with the DMOs through commenting, reposting, tagging other users and/or DMOs, participating in polls and sending the DMOs instant messages. During this entire process, notes and screen shots were taken, which form the basis of the analysis.

3.3 Data Analysis

First, a conceptual matrix with two dimensions—Weibo affordances and—MC goals was established. Since it is difficult to practically separate visibility, message format and reachable domain, they were combined. Then, the marketing efforts of each DMO were examined. Third, the specific DMO activities were assigned to individual matrix cells. Finally, the overall analysis focused on summarizing which affordances are fully taken advantage of, which ones are underused, and which ones are currently not used.

4 Results

The analysis of visibility/message format/reachable domain (Table 4) found that DMOs fully leverage the Enterprise Weibo page as an open medium to fulfill important marketing goals. Enterprise Weibo pages allow DMOs to release advertising banners and videos, and to create polls visible to a public audience. For instance, during the data collection period, the Sichuan and Guangxi DMOs promoted their natural landscape with a video on the top of their enterprise Weibo page while the Shanghai DMO highlighted a gala event through a display ad. In addition, the Shanghai DMO created a poll, asking tourists to vote for their favourite tourist attractions in the city. To foster behavioural responses to the display ads, the Sichuan DMO presented incentives and the Guangxi DMO provided a hotline number to encourage personal inquiries. In order to generate an immediate sales promotion effect, the Zhejiang DMO launched a three-day promotion campaign to promote one of the luxury hotels. To create personal selling opportunities, the Zhejiang and Shandong DMOs both provided inquiry hotlines and booking office addresses in their display ads. Taking advantage of their page for PR goals, the Shandong and Zhejiang DMOs featured well-designed business profiles with articulated mission statements.

Opposed to one-way public broadcasting on the enterprise Weibo page, marketers can also deliver promotional content to all subscribers through their personal feed. All DMOs engaged in this, using a variety of message formats and including contents that addressed the four different MC goals. Alternatively, marketers can also develop a one-to-one conversation by using direct messages. The finding, however, is disappointing. During the 1 month timeframe, the author did not receive any instant messages from the DMOs, including no replies to the messages sent.

Regarding DMOs strategic use of Meta-voice, the findings (Table 5) show DMOs understand the importance of building two-way dialogue with consumers. To advertise the destinations, the Shandong DMO released a post to introduce the city of Yantai. One of a consumer commented: “my hometown is Yantai, but I left there long time ago.” DMO replied: “there are more changes than you imagined

Table 4 Strategic use of visibility/message format/reachable domain affordances

Affordance dimension	Advertising	Sales promotion	Personal selling	Public relations
Publicly accessible	Released display ads; created polls; posted appealing content such as videos	Posted sales promotion messages	Provided contact number and booking office address	Company profile and mission statement; enticing images of attractions
All subscribers	Pushed posts with different message formats to subscribers' feed	Pushed promotional posts to all subscribers	Provided contact number and booking office address	Pushed images of attractions to subscribers' feed
One subscriber	X	X	X	X

Table 5 DMOs' strategic use of meta-voice

Affordance dimension	Advertising	Sales promotion	Personal selling	Public relations
Comment	Replied to consumer comments to build conversations	Leveraged consumer comment to drive consumer action	Provided contact information	Replied to consumer comments
Repost	Reposted consumer comments and posts; reposted their own well-regarded post	Reposted consumer comments on sales; reposted their own post to count down promotion timing	X	Reposted consumer comments
Tag	Tagged individual users, influencers or other tourism organizations	Asked consumers to tag others and DMO at the same time	X	Tagged individual influencers to maximize public reach
Like	X	X	X	X

Table 6 DMOs' strategic use of informed associations

Affordance dimension	Advertising	Sales promotion	Personal selling	Public relations
Hashtag	Classified topic of post to associate it with related searches and curated lists of related posts	Highlighted promotion message; attracted potential customers	X	Classified topic of post to associate it with related searches and curated lists of related posts
Tag	Tagged consumers, influencers and organizations to establish connections	Tagged tourism organizations who can provide detailed sales information	X	Tagged media organizations to get media exposure
Like	X	X	X	X
Following	Followed consumers, influencers and organizations to establish connections	X	X	Followed media and influencers
Favorite	N/A	N/A	N/A	N/A

and we welcome your visit 1 day." Moreover, DMOs interacted with consumers who were interested in specific sales promotions. In terms of the use of meta-voice for personal selling, when a consumer asked the Zhejiang DMO about the gala event, marketers provided customer support by providing information on how to contact their sales department. However, DMOs used the function of commenting mainly in responding to consumer inquiries rather than actively asking for consumer needs, which is an important goal of personal selling. They also used comments to generally promote a favorable image of the destination and their organization.

With respect to reposting, the results indicated DMOs have fully utilized the viral potential of Weibo. To support their own advertising goals, DMOs reposted consumers' favorable comments and posts on their Enterprise Weibo page. Alternatively, marketers reposted their own posts that had received a great deal of comments and reposts to make them visible again. Interestingly, the data showed marketers used reposting to create immediate sales promotion effects. For instance, the Guangxi and Zhejiang DMOs launched a five-day package tour promotion. They reposted the message every day for counting down. DMOS also utilized reposting of favorable comments to enhance their image as part of their PR strategy. Tagging is another function that was used strategically by DMOs. Marketers leveraged the power of influencers to attract consumer attention and interest in advertising posts. For example, the Shandong DMO tagged a popular opinion leader on Weibo to promote the gala event; meanwhile, they also tagged the event organizers. It is reasonable to assume that the detailed information provided by the event organizer is better able to stimulate consumer desire to attend the event. In terms of sales promotion, the data showed that DMOs asked consumers to tag other users and the DMO's Weibo account at the same time to

spread the message and make its spread visible to the DMO. DMOs can 'Like' consumer posts or 'Like' their own posts reposted by consumers if these consumers are followers or if the DMO follows them. This is not visible on the DMO page but the researchers checked up to 10 pages of followers and accounts followed for each DMO and found no evidence of this occurring.

With respect to strategic use of informed associations, the results (Table 6) show DMO's efforts in establishing connections. Hashtags are used in advertising and public relations in the same manner, namely to classify the topic of posts to make them searchable and connect them with related content. For instance, the Shandong DMO posted a message with 'the tasty cuisine of Shandong'. Clicking the hashtag leads consumers to a topic discussion page called "Wei Topic", which is a separate Weibo page. On this page, a curated list of related posts is presented. DMOs act as a host on the page to engage consumers in discussions. This also ensures that sales promotion messages achieve greater exposure. The most interesting example is the use of hashtag in achieving PR goals. The Guangxi DMO posted 'The Beauty of Guangxi' and asked consumers to develop a post using the hashtag. With regards to tags, DMOs posted advertising posts and tagged specific consumers, influencers or other organizations whom they follow in the post. For instance, the Shandong and Shanghai DMOs collaborated with other tourism organizations in launching a sales promotion through tagging their enterprise Weibo accounts. This study also found out that DMOs tried to maximize their media exposure by tagging mass media. As addressed in the previous section, the 'Like' function allows marketers to associate with consumer posts. No evidence of this was found. Favorite is a function that allows users to archive posts. Unfortunately, this activity is currently not visible to others and we found no references to this on the DMO pages either, which makes it impossible to comment on.

5 Discussion and Conclusion

Given the growing popularity of social media in tourism and specifically in China, this study developed a conceptual framework to investigate DMOs' strategic use of Weibo functionalities in achieving a range of MC goals. Findings reveal that DMOs take advantage of a variety of technological functions in fulfilling advertising, sales promotion and public relation goals but fall short in terms of realizing personal selling goals. However, one has to consider that DMOs have traditionally only engaged with corporate clients and might in general not have well formulated personal selling strategies. The liking function is underused despite its potential to give credibility to consumer posts and showing engagement that can contribute to a positive corporate image, and so is the direct message function that could serve several goals. Also, while the focus was on making statements across the five cases, it is clear that not all the DMOs use all functions. For instance, the findings show that only the Shandong DMO leveraged the customized Enterprise Weibo page modules by releasing a well-designed corporate profile to enhance their

corporate image. This suggests that there is variation in the level of use even within the best cases.

Being an exploratory study, the research of course has limitations. First, the case study method allowed for in-depth analysis of five very active DMO cases but the findings cannot be generalized to all Chinese DMOs. A bigger sample, also including foreign DMOs active on Weibo could provide important insights. Second, the data only includes what was observable. Interviews with the five DMOs would provide additional data, for example in terms of performance measurement and specific goals, and would provide important explanations for specific activities or the lack thereof. Further, the study focused on what is technologically possible. No indications can be made as to what activities are actually effective in achieving the MC goals.

Despite the limitations, the paper provides several contributions. First, it offers a conceptualization of Weibo affordances from a marketing perspective that will be of use to future research in this area but could also help marketing practitioners in understanding the platform and making strategic decisions as to what affordance/MC goal combinations to pursue. Second, it provides evidence of different degrees of adoption of Weibo among Chinese DMOs and suggests that this area needs further exploration. Third, it contributes to the literature on social media marketing in tourism and confirms that it is indeed very different from traditional marketing and requires a rethinking of approaches and the overall marketing mindset.

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SoCoMo Marketing for Travel and Tourism

Dimitrios Buhalis and Marie-Kristin Foerste

Abstract Advances in mobile technologies have enhanced the capabilities of marketers to identify the immediate preferences of consumers through social media. Latest generation devices are increasingly equipped with sensors that allow the reception of context-aware information about the consumers and their devices. This conceptual paper suggests that the combination of social media and context-aware technologies in mobile devices opens up a whole new range of opportunities for marketing. The paper calls this combination social context mobile (SoCoMo) marketing and offers a first definition. It also proposes a conceptual framework that illustrates the idea of SoCoMo marketing and provides room for a number of implications. It further explores the potential of this new marketing approach for travel and tourism and concludes that there are great prospects for the success of SoCoMo marketing in the near future.

Keywords Social media · Context-awareness · Mobile · Marketing · Travel and tourism

1 Introduction

The central aim of marketing is to provide consumers with the right product, in the right place, at the right time (Gilbert 2008). In order to achieve this aim, marketers need to have a comprehensive understanding of who their consumers are and what they need. Thanks to developments in Information and Communication Technologies (ICTs) over the past 20 years, such knowledge can now be easily acquired.

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The emergence of the Web 2.0 led to the development of social media, where consumers share in-depth information about their needs and preferences (Hensel and Deis 2010). Businesses engaging in social media can exploit this information in order to better address consumer needs and preferences and react upon market trends (Sigala 2012). This can lead to deep personal relationships between customers and businesses (McCabe 2009). In addition, mobile devices have evolved into multi-functional smart technologies with Internet access (Dickinson et al. 2012), allowing this relationship to become mobile. More recently, however, latest generation mobile devices are equipped with sensors that can accurately determine the user's surrounding contexts, which marketers can use to create context-relevant information (Mehan et al. 2013).

This paper argues that if the relationship to customers on social media is enhanced with context, marketers are able to provide even more personalised and relevant marketing content. Therefore it is the combination of social media (So) and context-aware marketing (Co) on mobile devices (Mo) that will drive successful businesses in the future. This combination could be called SoCoMo marketing, which may be defined as an advanced form of contextual marketing on mobile phones that facilitates the creation of social media empowered context-aware offers and information.

Although some innovative businesses are already implementing a combination of social media and context-aware technologies, few studies have made attempts to explore the potentials of that. So far, studies that investigated these combinations have mainly been limited to the area of social media in combination with location-based marketing. For example, Tussyadiah (2012) researched the combination of social networks and location-based services in location-based social network (LBSNs) marketing and found that the rewards provided by suppliers for interacting with them through these applications can lead to actual behaviour and loyalty. However, while there are clearly potentials of combining multiple context types, the literature is still lacking studies concerning a broader concept of social media and context marketing combinations.

This paper proposes a first conceptual framework of SoCoMo marketing and outlines opportunities that emerge from that. It commences with a comprehensive review on social media marketing and explores the latest technologies that have assisted marketers in obtaining contextual information. Since travel and tourism is an industry that tends to respond well to innovative mobile technologies, this area was chosen to outline a number of implications.

2 Conceptual Development

2.1 Mobile Marketing

In the past 10 years the incredible growth in the adoption of mobile devices has been particularly driven by the improved capability of today's mobile devices to eliminate the time and space barriers that have existed with stationary computers

(Okazaki et al. 2012). Faster processing speeds and decreased roaming charges make it easier for users to access information on mobile devices from any location at any time (Balasubramanian et al. 2002). Mobile devices are used in different and dynamic situations where the preferences of users tend to vary (Haekkilae et al. 2009). In particular, smartphones, which are cellular phones with built-in applications and Internet access (Dickinson et al. 2012), are playing an important part in the lives of many consumers as they allow them to access relevant services and staying socially connected while moving around (Bouwman et al. 2012). For users these advanced capabilities have extended the functionality of smartphones to variety of new services, such as social networking, information search and navigation (Wang and Xiang, 2012). For marketers, smartphones provide increased connectivity, communication as well as content creation and consumption (Wang and Xiang 2012). This has greatly improved the set of mobile marketing initiatives that use mobile devices and media (Shankar and Balasubramanian 2009).

2.2 Mobile Social Media Marketing

One of the areas that have been improved through the advanced capabilities of mobile phones is social media marketing. Initially, social media have evolved with the emergence of Web 2.0 that has given consumers a tool to participate in the creation of content (Hensel and Deis 2010). Social media comprise "activities, practices, and behaviours among communities of people who gather online to share information, knowledge, and opinions using conversational media. Conversational media are Web-based applications that make it possible to create and easily transmit content in the form of words, pictures, videos, and audios" (Brake and Safko 2009: 6). Consequently, they enable communication and group formation processes in a variety of contexts (Tussyadiah 2012). Businesses engaging in social media can exploit this increased activity in order to better understand and address their customer's needs and to find out about new market trends (Sigala 2012). The interactivity between consumers and suppliers on social platforms provides a number of opportunities for social collaboration, networking, learning intelligence and community building. This facilitates co-creation, which is a set of methods used to establish an active, creative and social collaborative process between producers and customers (user) in the context of new product development (Roser et al. 2009). Co-creation results in the generation of ideas that reflect the needs of the customers more closely than ever before (Hoyer et al. 2010). Hence, social media simplifies and improves personalization by letting the marketer adapt the content and presentation to match the user profile.

Since the introduction of mobile devices, social media marketing is possible from anywhere and at any time. Especially smartphones have become portable platforms for social communities that further facilitate interaction (Wang and Xiang 2012). This mobile social activity on mobile phones enables consumers to share

their decisions and enforce immediate reactions and recognition (Tussyadiah 2012). If this is coupled with the use of location-based services, such as GPS, a bridge between the social conversations and interactions in the digital world and the intangibility of the real world is built (Chiat 2013). In recent years marketers noticed that if they combine the location-aware capabilities with social media marketing on smartphones, they can connect the information about what humans do and how they share experiences with their need for information from their immediate environment and the ability to have both met "on the go" (HeBsdigital 2012).

2.3 Context Marketing

Context has been an important research topic for more than 20 years. It can be considered as a response to the growing amount of information available online, which is more frequently confronting consumers with too many options they need to choose from (Gao et al. 2009). In particular, the large amount of heterogeneous information has started to create difficulties for people to find information related to their current situation (Tanca et al. 2011). Nevertheless, there is still no universal definition of context. One of the most frequently cited definitions was developed by Abowd and Dey (1999) and describes context as "any information that can be used to characterise the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves". The information that characterises context is referred as contextual information, which can be of external or internal nature (Prekop and Burnett 2003). Examples of external contextual information or information from the physical environment can be location, proximity to other objects, time, conditions, pressure, temperature and lighting levels (Prekop and Burnett 2003; Schmidt et al. 1998). Examples of internal contextual information or human factors would be goals, personal events, tasks, social environment and emotional state (Prekop and Burnett 2003; Schmidt et al. 1998). Table 1 illustrates this further.

The table shows that while location is sometimes used interchangeably with context, it only represents one aspect of the physical environment, which tends to be adopted as an approximate of a far more complex environment (Schmidt et al. 1998).

From a marketing perspective, context comprises all those "supplementary facts, rules, or axioms whose consideration makes our communications efficient, our commands actionable and our situations understandable" (Mehra 2012: 12).

Mobile devices are said to bring the biggest potential for creating context-related information (Dalmau et al. 2009; Haekkilae et al. 2009). According to Lamsfus et al. (2010) the dramatic development of mobile devices and connectivity technologies is paving the way for the emergence of context-based services. Latest

Table 1 External and internal contextual information

External contextual information	Internal contextual information
• Location	• Tasks (e.g. to look for a job)
• Season/Time	• Emotional stat (sad, happy etc.)
• Air pressure	• Goals
• Humidity	• Personal events
• Light	
• Weather	
• Social environment	

generation devices are more frequently equipped with sensors that can obtain information about the physical environment, the handling of these devices and the user itself (Schmidt et al. 1998). This is making them aware of the situation in which they are used and of the tasks that the user will perform in the near future (…)", which is referred as context-awareness (Haekkilae et al. 2009: 2). This up-to date, situation-specific information while the customer is on the move has a great potential for facilitating social interaction and collaboration (Haekkilae et al. 2009).

From the perspective of the consumer this context-aware information can create an additional meaning to the information provided by the user of the mobile device (Schmidt et al. 1998). Moreover, context-aware data creates a parsimony of communications and interpretations that is enabled through context by supplementing what has been said or left out, which revolutionises the mobile experience (Mehra 2012).

An already widely adopted form of marketing that applies of context-aware technologies is location-aware marketing (LAM). This type of marketing is based on the idea to use the location of consumers to communicate and engage with them in order to predict their needs (Beldona et al. 2012). Therefore, marketers adopt location-based services to identify the location of a consumer and send location-specific offers based on the preferences and behaviours this consumer has revealed on social media (Shankar and Balasubramanian 2009). Since they are based on the consumer's interests, activities, location and time of the day, which enhances the level of personalisation generated through interactions on social media, these messages to the consumer tend to be highly relevant (Xu et al. 2011). However, despite location being a core element in the use of context-aware applications (Prekop and Burnett 2003), developments in sensor technologies allow increasingly the inclusion of a growing number of multiple sensor types, such as optical sensors, audio sensors, motion-sensors or bio sensors, in ultra-mobile devices (Schmidt et al. 1998). These advanced capabilities reduce the previous over-reliance on location and provide a more accurate model of the consumer's context.

This paper argues that if the advantages of social media marketing are combined with contextual marketing into social (So) context (Co) mobile (Mo) marketing it will maximize potentials. It defines SoCoMo marketing as an advanced form of contextual marketing on mobile phones that facilitates the creation of

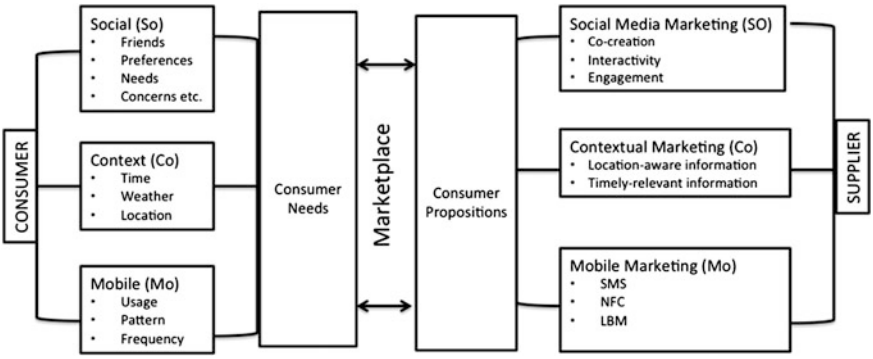

Fig. 1 Graphical representation of the SoCoMo marketing approach

social media empowered context-aware offers and information. This definition is embedded in the conceptual framework that is illustrated in Fig. 1.

The framework explains that SoCoMo marketing is based the retrieval of highly in-depth information about the consumer by the supplier. This information is generated from three sources. The first source of this information is the consumer himself when he reveals information about his life on social media. This can include preferences, needs, concerns, sexual orientations or wishes. The extent of this information may, however, vary depending on the consumer's importance of privacy. The second source of information is generated within the context of the consumer and his mobile device. It is extracted by sensors that are in-built in the mobile device and contains contextual information, such as weather conditions, location and time. The information supplied by the consumer on social media and the information filtered from the consumer's context by mobile devices may overlap. For example, the consumer may reveal his location on social media while this location can also be identified through sensors in the mobile device. The third source of information is the mobile device itself on which mobile-device related information, such as usage, patterns of usage and frequency is documented. Altogether these three sources generate a unique profile of the consumer's needs. The supplier on the other side can access this information through a context management system that enables him to predict the necessary propositions or intentions of this consumer. Using this information the supplier can craft a unique marketing message that will adequately address the consumer needs through on the combined application of social media (So) and context (Co) marketing on a mobile device (Mo).

The conceptual framework allows the derivation of a number of possible advantages that may be provided through SoCoMo marketing from the perspective of the supplier as well as from the perspective of the consumer. These are listed in Table 2 and further outlined below.

From the perspective of the supplier the most obvious opportunity emerges from the huge amount of in-depth data that can be obtained. With increasingly

Table 2 Advantages of SoCoMo marketing for suppliers and consumers

Suppliers	Consumers
• Long-term loyalty	• Personalised, situation-specific information
• Influence consumer decision making	• Customer satisfaction
• Increased co-creation	
• Opportunity to compete among larger businesses	

precise sensors and techniques, this in-depth data exceeds the current capabilities of marketers by multiplying the contextual relevance for the consumer and therefore enhance consumer long-term loyalty. Contextual-awareness of smartphones enhances the ability to provide ideas for ad-hoc decision-making 'on the go' by providing an additional layer of information to the information online and on social media (Dickinson et al. 2012). Therefore, SoCoMo marketing can give marketers a tool to influence the decision-making of consumers and to direct them to their businesses and services. It can further the process of co-creation by including the information from the consumer's surrounding contexts, such as close businesses and nearby available services. As the tools for SoCoMo marketing are available for any business, independent of their size and nature, it may also create awareness for local brick and mortar businesses and give them an equal chance to compete against larger organisations.

Consumers, on the other side, benefit from SoCoMo marketing through the reception of highly relevant information that is personalised to their needs and preferences, and takes into account their current situation. This combination provides an additional value for the consumers, which may increase their satisfaction with the mobile experience and encourage them to use more context-aware services and reveal more identity information on social media.

3 Implications for Tourism Marketing

Advances in mobile marketing respond greatly to the fundamental need of tourist, which is information (Gruen 2001). Tourists need higher levels of information to reduce the perceived risks of purchasing intangible, inseparable and perishable products (Gilbert 2008). According to Steinbauer and Werthner (2007) tourist need information throughout all stages of their travel experience. Since mobile devices provide travellers with reliable and unlimited access to information on the Internet (Wang and Xiang 2012) they can be used to acquire information at all stages of the travel process (Hoepken et al. 2010). While already being at the destination, smartphone owners can acquire information that was unforeseen before their trip through an information search at unexpected time and at unexpected places (Okazaki et al. 2012). Marketers can use this as an opportunity to support travellers by supplying them with information at their home and on the way (Wang and

Xiang 2012). However, a recent study by Wang and Fesenmaier (2013: 67) found that mobile devices like smartphones "unlock the three-stage model of the travel experience by eliminating or shortening the pre-consumption and post-consumption stage and extending the consumption stage". During this stage travellers find themselves in unknown environments where they need personalised, up-to date information (Steinbauer and Werthner 2007). The changing travel contexts during this stage may lead them to unplanned behaviour based on immediate, unreflective and spontaneous decisions (Lamsfus et al. 2013). Hence, it comes as no surprise that scholars have revealed a growing need for context and context modelling by marketers of travel and tourism services (Lamsfus et al. 2013). This is where SoCoMo marketing comes into play. First of all, the social media element of SoCoMo marketing presents an extremely powerful medium to communicate with the tourists (Wang and Xiang 2012). Tourists were found to use social media at all stages of their travel process (Fotis et al. 2012). The personalised information created through the engagement of tourists and businesses on social media can increase the usability of unknown and temporarily used services (Hoepken et al. 2010). In addition, providing contextual information can assist tourists in better coping with changes and timely react upon them (Bouzid et al. 2009). According to Lamsfus et al. (2010) context in tourism facilitates the negotiation between information provided by tourism organizations and the information required by tourists at certain points of time and based on their situation (Lamsfus et al. 2010). Through their interaction on social media during the on-trip stage and the supply of context-related information, tourism businesses can help tourists to cope with unexpected situations and to continue their travel experience in an efficient and effective manner, which encourages them to make more spontaneous decisions about travel-related components. This may relieve tourists from actively browsing through the web for information and hence contribute to a more convenient tourism experience.

However, with the enhanced opportunities come a number of challenges that businesses intending to adopt SoCoMo marketing need to consider in their strategy. One of the major challenges is that collecting a combination of different contextual information about a person raises questions about how this would affect the consumer's privacy. Taking consumer privacy and security rights into account is especially important when considered that the responsiveness towards mobile promotions strongly depends on the consumer's attitude to mobile marketing (Shankar and Balasubramanian 2009). The second challenge is to cope with the currently existing technological limitations that continue to limit the opportunities of SoCoMo marketing. The list of technological challenges is long. For example, many sources report that the batteries of today's smartphones are not good enough yet. The power of these batteries is often drained quickly by the GPS function for location-based applications (Warres 2012).

4 Conclusions and Future Research

Recent advancements in technologies have led to a growing amount of devices that allow marketers to generate information that is highly personalised and can take into account the situation of the consumer. This conceptual paper investigated the potential of combining social media marketing and context-aware technologies in mobile devices into SoCoMo Marketing. With the growing adoption of smart mobile devices and their expansion into the everyday lives of consumers, SoCoMo marketing is likely going to play a major role in the near future. Especially in tourism where consumers are considered as heavy adopters of mobile devices (Lamsfus et al. 2010) SoCoMo marketing can contribute to a more satisfying experience. In the near future context-aware services will be enhanced with a lot more information that is transmitted without the consumer's consent. The semantic web will bring about technologies that recognize and understand the meaning of content and therefore maximize the potentials of SoCoMo marketing. Those companies that understand SoCoMo marketing now will be able to successfully benefit from new possibilities in the future.

This conceptual paper introduced the idea of SoCoMo marketing by offering a first definition and proposing a framework that can be used as a basis for further research. Future studies can enhance the relations among the components of the model and investigate managerial implications and the requirements for realizing many of the advantages suggested from SoCoMo marketing. They could also focus on exploring the various influences SoCoMo marketing may have on the travel behaviour and how this affects the performance of tourism businesses.

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Content Curation and Narrative Tourism Marketing

Oriol Miralbell, Aurkene Alzua-Sorzabal and Jon Kepa Gerrikagoitia

Abstract This paper explores the communication features of content curation tools based on storytelling and content dissemination in social media from a tourist marketing perspective. Narrative structure of tourist information and self-referential memory stimulate empathy in readers towards the destination and influence their decisions when planning their holidays. Content curation tools integrate different services such as filtering, wrap up and publishing content that can be organized in a sequential form following episodic narratives to be diffused through social media. This fosters debate and conversation between the readers who will in some cases share the content inside their networks. Reactions can be tracked and followed by marketers to review their marketing strategies, to individuate stakeholders among readers and to collect feedback.

Keywords Content curation · Storytelling · Social media · Tourist destination, marketing

1 Introduction

In the new paradigm of communication that derived with the advent of the Internet, tourism marketers focus their strategies on attracting tourists' special interests by personalizing their services, providing better information and intensifying mutual

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communication. The emergence and growth of online social networks in the web 2.0 has meant an extra spin on the change of the communication strategy of destinations and tourism enterprises, so that the communicative speech, in early times, one to many, has become multidirectional, many with many. The tourism industry as all the rest is living in the midst of the network society defined as the new scenario in the network economy, where knowledge, innovation and flexible relationships are key to competitiveness (Castells 2000). In such an intense informational dependent industry, mobility and knowledge sharing have become key components in their functioning, while social networks mean a perfect environment for innovation and marketing.

However, due to their structure of micro, small and medium enterprises, most tourism companies have limited access to resources, capital and knowledge (Walder et al. 2006) and this greatly hinders the integration of ICT as well as the emergence of a cooperative network culture (Hjalager 2002; Peters 2001; Sancho et al. 2004) that could benefit their competitiveness. Also in the vast majority of small tourist destinations, due to their limited resources DMOs and Tourist Boards have often failed to make successful use of social media to attract new tourists or to gain loyalty of their visitors. Thus, social media are becoming though powerful tools for tourism marketing.

2 Social Media and Tourism Marketing

The idea of "user generated content" (Kaplan and Haenlein 2010), is the key distinctive feature that changed the previous stage of the web 1.0, where website owners had exclusive control on the content, since it opened the communication in the Internet to a social collaborative level. All kind of content, in different formats is generated in the Web 2.0 with a strong creative effort of the web users that publish spontaneously in public websites. Inside the web 2.0, the social media help users to reinforce their social presence by adding tools for self-representation and self-revelation. Social Networking sites offer the platforms to the users to build their social networks giving the possibility to (1) create a public profile, (2) manage a list of contacts and (3) have access to the lists of their contacts and to establish new cross-relations (Kaplan and Haenlein 2010).

This new social paradigm in the digital world offers powerful possibilities to increase social communication but requires from participants specific skills to communicate effectively, great abilities in using the social media tools and, a new marketing culture in a digital social environment. The lack of experience of most companies in such a new environment has been compensated with initiatives closer to experimental actions with not well-designed and planned strategies. Tourist boards, more daring and restless in using social networks have been often first movers in their destination in exploiting online social networks for marketing, although there is a lack of research analysing the ROI or the effectiveness of these marketing campaigns.

A false belief of marketers could be to prioritize as communicative strategy in social media marketing campaigns the viral dissemination of information above facilitating discussion and debate around tourism content. By doing so, they would miss much of the information that results from the knowledge exchange between actors in a social network.

In the new communication scenario for tourist destinations, sharing content related to the destination through the online social networks will generate conversation and knowledge exchange between the stakeholders of the destination: the DMO, tourist service providers and the tourists.

This is raising a new challenge for communication in the social networks opening a new strategic line in the tourism business where information and content are so decisive in the process of taking the decision to purchase, to support the tourist during his or her visit and the communication post trip. Tourism companies and tourist destinations can take advantage of social media not only because they can access to their customers, but also because they can make accessible their information in form of content items and the resulting conversations available in online social networks to other consumers. By doing so they will increase the customers' attention, awareness, trial and loyalty levels (Blackshaw and Nazzaro 2006).

3 Content Curation as a New Resource for Tourism Marketing

Content curation is the action of filtering the information on the internet and spreading it accurately and in the interests of certain segments or target audiences. It means to add value to existing information by ordering and distributing this information among those who can best have interest on it. It is not always necessary to add additional content. Often an intelligent filtering (reflective, selective, strategic, effective, functional, useful, etc.) and dissemination of content is effective enough.

When we talk about content we refer to the information used in the web and that can help readers to gain knowledge. Content items can appear in many forms such as text, multimedia (e.g., images, videos), and structured data (e.g. metadata). We see content as normally free and web-based. Its nature and scope "is based on topics and resources that the specific community finds valuable enough to curate" (Rotman et al. 2012).

Curation integrates several activities in its process such as identifying, selecting, validating, organizing, describing, maintaining, and preserving existing objects. Similar to the curation of museum objects (e.g. an art exhibition) where curators work in a narrative explanation of the artifacts, content curators have to be experts of the object in this content (Rotman et al. 2012). In our case, tourism marketers must know about tourist services, tourist attractions, tourist destinations, etc.

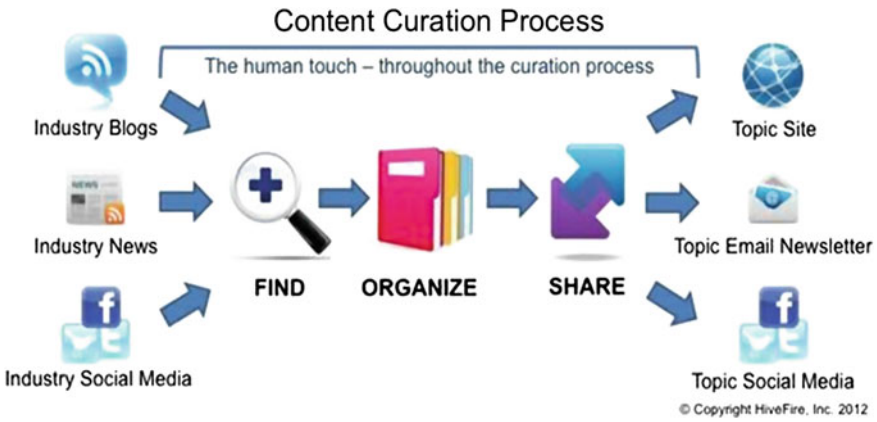

Fig. 1 Content curation process (HiveFire—http://www.curata.com)

In the curation of contents various tools are involved, the main of which is (1) **the "content curation site"** that offers the following services: (a) *finding, filtering and selecting* the contents, (b) then *sorting and posting or publishing them,* and finally (c) *disseminating and sharing content* through social networks. Figure 1 represents these three stages of the process of content curation. First, curators collect information content from RSS feeds of blogs, digital news and social media posts dealing with the topic of interest. In a second level, they filter and organize this content in a digital publication where it is available to readers. In the third part of the process, content curators, share the content, by posting it in specific sites related to the topic of the contents (blogs, destination site, etc.), by sending e-mails to list of followers or by posting it through the social media.

However, it should be borne in mind that in curating content it is especially important to foster a conversation with the audience. Thus, other tools are involved in the process (2) **social media,** i.e. those social networking sites in which operators will disseminate the contents; and (3) **the tools for the analysis of customers' reaction** helping operators to (a) gather information on the activity in the network, (b) determinate which reactions and responses have caused the curated contents, (c) to identify which readers are more active both adding comments or retransmitting the content, and finally (d) what are the networks that arise around both the tags and the topics of the content that have been released, as also the networks structured around the most active and interested readers.

3.1 Features of the Content Curation Sites

In the recent years, there have been developed several content curation sites on the Internet (*ScoopIt, Storify, Paperli, Pulse, Pocket, Buffer, NewsMix, Curata,…*), most of them with two different levels of service: a free one, where users can

access to the basic services, while the premium services (with payment) offer a higher level of control over the content curation activity, such as managing a larger number of topics, to have a larger number of administrators, access to better statistics about the activity, better control over the dissemination channels, etc. In all these content curation sites curators can group the content around specific topics assigning a different web page for each topic. In general, content curation sites available today on the Internet are offering the following features in their services:

For the *process of searching, filtering and collecting the information* available on the Internet, most content curation sites offer the possibility to search contents automatically or manually. Some of these services offer plug-ins to be integrated into the web browsers like *Google Chrome, Mozilla Firefox, Microsoft Explorer*, etc., so that users can publish the information they are reading in the content curation web page just by clicking on the icon in the web browser. They also offer the possibility to extract the information, filtering the existing content on the Internet according to some pre-programmed "tags", with the possibility to gather automatically the information from previously selected sources (blogs and social media accounts like *Twitter, Facebook, LinkedIn, Youtube,* etc.) and digital media (newspapers, broadcasting, etc.). For a successful content curation it is very important how accurate and precisely the site can filter the information, and how fast and easily this can be done. I this case, the best sites offer pre-programmed filtering where the profile of the desired information can be refined very precisely.

When *publishing the information*, most content curation sites offer the possibility to wrap up the content items that have been previously filtered in web pages, so that every page is grouping information of a specific topic. In some cases, the curator can also control the design of the web page. There is the possibility in some sites to publish also the content items inside personal blogs. Or group them in form of a digital newspaper or digital magazine, so that the reader can find the content organized according to themes.

Regarding the *dissemination and propagation of the contents*, all of the content curation sites offer the possibility to use the online social networks, groups and pages for spreading their links to attract readers to their content pages. Curators have also the possibility to disseminate each content item separately, or to publish in the social media account the link to the web page in the content curation site where all the content items are published.

A very distinctive feature of the content curation sites is the *statistical information related to the activity of content curation*, such as the number of content items that have been selected, published and disseminated; what impact they had among the recipients; how many new readers have subscribed to the page in the content curation site; how many readers have rediffused the news; etc. This service is not always available at the free account level but at the premium one.

Alternatively, there exist in the Internet some free social network analysis apps designed to analyse the activity in the social networks where curators are spreading their content like *Facebook, Twitter, LinkedIn*, etc. There exist also several social network analysis tools like *Gephy* or *NodeXl*, to extract information of the network

activity from *Twitter, Facebook* or *LinkedIn* (more information at: http://en.wikipedia.org/wiki/Social_network_analysis_software).

Some features are fundamental for the successful management of social media in general and content curation in special, such as to provide a high level of autonomy to the users in managing information and to access to other members. It is also important that content citation sites provide an open and flexible access to other systems and networks letting users contact and interact with other members and information sources, facilitating also the contact with a larger and more diverse number of groups (Downes 2008; Miralbell Izard 2013; Siemens 2006).

4 Knowledge Exchange and Storytelling Through the Social Media

To understand the factors for success of content exchange in social media we shall consider several theories and studies done in different disciplines in social sciences. Social media provide different levels of knowledge exploitation so that they can be used either for experience-socialization or/and intelligence proliferation (Shang et al. 2011). Taking advantage of these features, content curation is a powerful tool for knowledge transfer or dissemination and for knowledge creation. In Fig. 2 we can see the Knowledge-creation cycle in web 2.0 sites. It is shown how content curation actions participate in a knowledge creation cycle, especially in the combination and internalization of knowledge, while transfer and dissemination occurs in the socialization and externalization phases of the cycle.

In *combining knowledge*, content curators filter the information, using sharing resources such as RSS, social bookmarking or hash tags, and mashing up content from others available in the web. In the *internalization phase* of the cycle, content curators combine information sequentially and add comments, according to a narrative strategy in form of storytelling. Finally, in the *socialization phase*, curators disseminate these contents through social networking sites and the consequent interaction of receivers that generates new knowledge that will be externalized in blogs, digital media or in social media.

4.1 Narratives, Storytelling and Tourism Marketing

Knowledge exchange has important effects on participants that can improve marketing strategies. Some of these effects depend on the type of content and the narrative that can foster emotional reactions in the audience. These reactions are strongly related to *personal experiences* and personal values.

This is especially true in tourism, because tourism is for most consumers an experience lived away from their normal and ordinary live. The importance of this

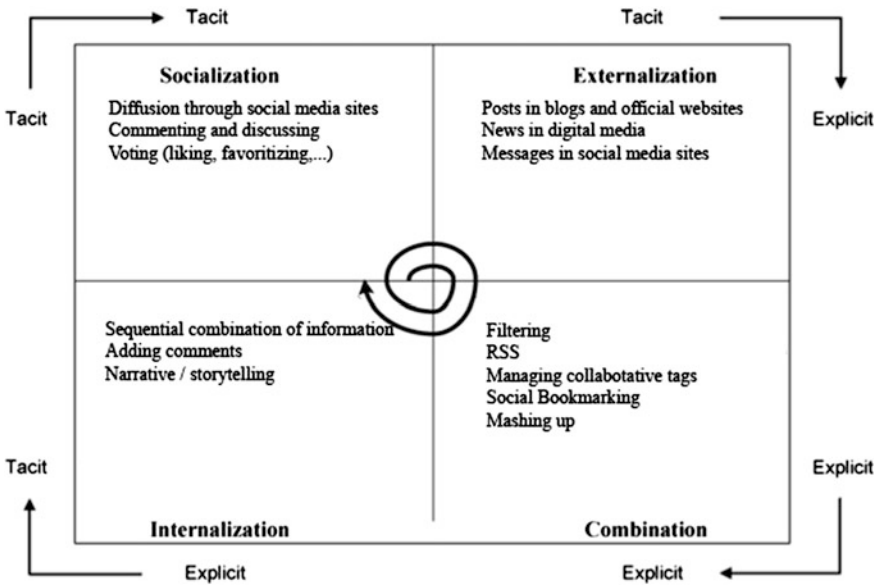

Fig. 2 The knowledge-creating cycle in content curation (adapted by the authors from Shang et al. 2011)

experience is due mainly because it happens or it is located within a "distinctive visual environment" that gives to all sort of activities a special and unique character (Urry 1992). The same as it happens with leisure, tourism becomes here an experience or a state of mind unique and personal (Mannell 1984).

In social media readers can access to *experienced identities* of writers created through actions, attitudes and values projected in the *narrative* of their posts and messages (Tussyadiah and Fesenmaier 2008). In fact, well developed stories can better attract viewers or readers (Hsiao et al. 2013) influencing their emotional reactions (Escalas and Stern 2003) with a *narrative structure* where the writer integrates the traditional parts and an organized *order of the story* (Hsiao et al. 2013).

According to Escalas and Stern (2003) stories are important resources in marketing because they can evoke *empathy* among the readers and generate empathic responses. A story can be seen as facts bundled up in an emotion that can push readers to act in a new way (Maxwell and Dickman 2007). When the memories of the audience's past personal experiences get stimulated, readers will project themselves onto situations and emotions from experiences similar to those of the author (Duan and Hill 1996).

In storytelling *self-referential memory*—those memories of events from one's own life—together with the narrative structure are essential for evoking empathy of the reader, which, in its turn will influence his or her attitude as a consumer (Hsiao et al. 2013). Thus, storytelling demands a strong understanding of the

audience, to be able to react to it and even adapt "the story and the way the story is told to the audience" (Abad et al. 2005).

In content curation marketing strategies, stories are written by others, though curators filter these stories according to their narrative strategy in the means to evoke to the readers the emotions and self-referential memory and triggering empathy to share and comment these stories. They have the resources to disseminate or to transfer this content through the social networking sites to reach their audience that hopefully will share it with their contacts and friends in a word-of-mouth communication way, which can contribute to marketing success.

This narrative strategy through storytelling is not exclusive of consumers but also marketers can create social roles for brands in commercial webs (Wang et al. 2007). With storytelling content curators try to increase consumers' interest, attention and feeling of control, elaborating a narrative made of sequentially ordered news and contents they diffuse through the online social networks to their customers and followers.

Much of the information that individuals keep in their memory and retrieve later has an episodic structure (Fournier 1998; Schank 1990) and has been gathered through their relationships. Thus, in the digital word-of-mouth storytelling inside online social networks chronology and causality are especially important (Delgadillo and Escalas 2004).

Through storytelling marketers provide to consumers "proper's pleasure" (Woodside et al. 2008). As Bagozzi and Nataraajan say "people need help in finding what makes them happy, and this is where marketing comes in" (Bagozzi and Nataraajan 2000). In retrieving, reliving and repeatedly reading stories "consumers find proper pleasure, a sort of catharsis, and experiencing archetypal myths" (Woodside et al. 2008, p. 99).

4.2 Conversation and Content Diffusion Through Social Media

Content curation has the capacity to foster conversation between readers through dissemination in social networks. It involves a new way of filtering information beyond the mere selection and publication of news information, as it requires a strategy, a plan to be integrated in order to provide a narrative of content. In the case of tourism destination marketing, content curation seeks to convey in a sequential format of news and messages those values, resources and factors that capture the interest of tourists and help them to build their understanding and appreciation of the destination. It also reinforces the customer's identity and interest on the uniqueness and particular experience of the destination. Under a marketing perspective it is difficult to think that these narratives can also trigger critical attitudes from the tourist if this attitude has not been caused by negative experiences in previous visits to the destination.

Indeed, one of the features of communication strategies using content curators is to prioritize the content as an exchange currency and as a generator of conversation and debate. Social networks allow, however also virally spreading this information and are not incompatible with encouraging conversation and debate. The process of disclosure or dissemination of the information with content curation using the different social media channels should consider both possibilities choosing the best-suited channels in social media for each of these two actions: viral diffusion or conversation and debate. There are social networking sites like *Twitter* especially powerful and effective for viral communication (Kwak et al. 2010), but much less for debate and conversation, as it is difficult to follow conversations with *Twitter* in a sequential manner. However, social networking sites like *Facebook* and *LinkedIn* allow both actions. On the one hand they are well suited for debate and discussion, but also for viral dissemination, either through the "share" option or adding a "like" mark to the message, i.e. favouring the content that user like best or consider as interesting (Miralbell Izard 2012).

However, the massive success of social media with millions of users and topics makes difficult to find the critical information, even though the use of labels in the messages or "hash tags" has become a successful resource to create groups around different subject and make them visible. Another form of referring interest topics is through the efforts of online consumers in organizing the contents through what is called "digging" and "tagging" (Xiang and Gretzel 2010) that followers can read. Consumers even add very frequently hyperlinks in their messages in social media. Consequently information shared in social media appears also in a substantial amount in search results of search engines (Xiang and Gretzel 2010). Social media are especially used for sharing experiences during the holidays, they influence tourists in the process of making plans for holidays, prior to the final decision. Working as content curators, tourism companies and destinations can find in these communities the online social networks where they can spread their content.

The dissemination of content through the social media has a bigger effect than a mere spread of information, because it offers the possibility to integrate receivers into the network of disseminators where interaction, collaboration and discussion will increase marketing effects. With a strong motivation to give feed-back over word-of-mouth, customers tend to develop feelings of connection with the companies to which they feel almost loyal (Pierce et al. 2003). Consumers, even tend to express a sense of identity with the brand using adjectives of ownership like mine or ours when writing their evaluations (Asatryan and Oh 2008). According to Pierce et al. (2003), consumers show a strong desire to control their relation with the company or the brand through their messages with which they feel a sense of being efficient, intrinsic and extrinsic satisfaction and pleasure in providing advice to others. Social media can help destinations to modulate the responses of customers towards a positive marketing effect. The commitment that the customer/tourist can have with the organization/destination arises from the feeling of connection between customer and the organization in tourism content curation marketing campaigns. Content curation can leverage this sense of identification to

strengthen the bonds of connection between client and destination and get the involvement of the customer/tourist in the retransmission of the curated narrative with added comments. On the one hand this means reinforcing customers' loyalty and, secondly, it allows taking advantage of using online social networks for virtual recommendation through word-of-mouth with friends.

Also important in sharing knowledge is the motivation that individuals find in their relationships tending to develop compensatory behaviours avoiding those that may have a high cost, according to the *Social Exchange Theory* (Emerson 1976). In social media there is a mutual motivation or mutual reinforcement compensation that may not always be monetary but social such as opportunity, prestige, approval or acceptance (Emerson 1976). That should be the reason why in social media there are far more people consuming information than generating it (Pan et al. 2012). According to The Global Web Index (Li 2010; TrendsStream Limited 2010) users of social media tend to be grouped according to four behaviours: (1) *watchers:* consuming content only for decision making; (2) *sharers:* uploading and forwarding information helping others and showing knowledge; (3) *commenters:* reviewing and rating products and comment contributions from others; and (4) *producers:* creating their own content in an effort to express their identity and gain recognition. All of these are target groups for content curation. Only the strategy will have to vary of each one and the outcomes will also be different.

5 Discussion and Conclusions

Content curation offers to tourist marketers a powerful tool for new communication strategies where the narrative of the information in form of content items can generate empathy and positive behaviours with the tourist destination or the services. Given the networked functionalities of this new communication environment, where actors in the destination can share content with tourists, it can drive new working models that facilitate a more collaborative way of marketing the destinations, and can foster the emergence of a new professionals, the tourism digital animators, who are experts in promoting and facilitating the use of online social networks among tourism professionals and organizations in the tourism destinations.

To manage content curation these new tourism professionals must have the skills to develop new narratives that enable interaction with tourists, strengthening their loyalty and serving for better positioning the tourist destination in online social networks. These professionals can help the tourism companies in the destination giving advice and training in the use of social marketing, and supporting the creation of joint strategies for the destination in the social media.

In short, content curation tools offer an opportunity for the development of new narratives around the destination that complete the everyday's information and

become a new communication practice. This would involve actions such as "place making" when creating identity and experiential places with which the tourist can feel identified, while it generates a conversation between tourist and destination through social networks. Content curation tools can improve the reputation and visibility of the destination on the Internet and in online social networks, though it goes a step forward than the mere use of social media as a communication channel by spreading sporadic viral messages, which often consist of repeating the advertising published in traditional media.

In this paper we have explored the communicational features of content curation and the related research to explain the arguments that make of it such a powerful marketing tool. There is a great opportunity for the research and study on the functioning of content curation for marketing, especially to analyse the efficiency of communication strategies and the reactions of customers as collaborators. Even if information and knowledge are intensively spread in the social media, there is much to study on the real dimension of knowledge generation and knowledge exchange. We know that watchers dominate the scene together with sharers, while commenters and producers, who really can add value to information, are scarce. Content curation can be used as an instrument for sharing by publishing and disseminating existing content or it can be used to add value, commenting it but also through an accurate filtering and organization of content items generating new stories for the readers. It would be advisable to explore the convenience and practical use of both strategies.

In the means of studying the impact of tourist information in social media, the authors are working in a specific research project to be finished in 2014, focusing on the use of content curation for marketing tourist destinations in the Web 2.0. This research will observe during two months the content curation marketing campaigns of fifteen DMOs analysing the narratives in the content items, their sequential evolution and their diffusion. Finally, in the research the impact in the social media will be analysed.

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Destination Benchmarking with Geotagged Photographs

Wolfgang Koerbitz and Irem Önder

Abstract Benchmarking tourism destinations is essential to improve and also observe what others are doing right. This process has different steps and choosing the right partners is a crucial one. Although there are many studies about how to benchmark destinations, there are no clear steps that explain how to choose destination partners. Tourists who visit the same destinations can be an indication of destination benchmarking partners. This is an explorative study to identify benchmarking partners of Austrian regions using Flickr photos. First, the regions the tourists had visited in Europe and in Austria were located. Then the destinations that share the most tourists were chosen as benchmark partners. The results show that Vienna and Salzburg can be benchmarked with cities such as Paris and Prague. The smaller regions of Tyrolian Unterland and Traunviertel can be benchmarked with neighbouring regions, which offer similar outdoor activities like skiing and hiking.

Keywords Destination benchmarking · Benchmarking partners · Flickr · Jaccard-coefficient

1 Introduction

Tourism in Europe is growing in terms of arrivals and bednights in the last 5 years ("The European Cities Marketing Benchmarking Report 9th Official Edition 2012–2013," 2013). Thus, competition between European cities and regions is

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also rising. In this case, the cities and regions need to know their competitors and understand the differences and similarities between their city/region and their competitors.

Benchmarking is a way to compare one's performance with the best performer in the field. It involves not only investigating the best practices in the industry, but also evaluating one's own performance and creating a plan that has structured objectives and targets (Boxwell 1994). The main advantage of destination benchmarking is to find out what the best performing destination is doing differently from yours, examine the issues that others are taking into consideration, and use all this information to improve your own destination. This process reveals the strengths and weaknesses of your own destination and shows what needs to be done. Nevertheless, it is not only about comparing your destination to the best performer, but finding a similar destination to yours. For instance, benchmarking Paris with Linz is not suitable since Paris and Linz are not in the same category. They are both European cities, but the size of the cities, the motivations of the visitors to these cities, and the number of bednights they have are not comparable.

One of the most important steps in destination benchmarking is choosing benchmarking partners; there have not been many studies that deal with the methodological aspects of this issue (Wöber 2002). Statistics, industry reports, government sources, and academic papers can be used in the selection process of partners. Also, site visits to potential partner destinations to observe how the other destinations are doing is one way of choosing a partner. Another one is getting feedback from visitors who visit other destinations (Kozak 2004). However, in destination benchmarking research, there is a gap in explaining clearly how to proceed with the selection process of benchmarking partners.

As a result of the gap regarding identifying benchmarking partners, destination benchmarking requires new approaches. Similar type of people visit similar types of destinations and a statistical analysis of trip patterns to these destinations, such as from Flickr photos, may reveal groups of destinations that are competing for the same tourists. They can then be categorized as benchmarking partners. Nevertheless, the choice of benchmarking partners depends on many factors, such as the type of destination (e.g. sun and beach, cultural), the motivation of the tourists (e.g. relaxation, education), and visitor demographics.

In this study, Flickr user photo trails are used to identify the destinations the users have been. Assuming that similar people visit similar types of destinations, the regions that have been visited by the same tourists are identified as benchmarking partners. The users' country of origin and the places visited are the similarity indicators that are used in this study. The concurrence of visits and Jaccard coefficient are used in the analysis. For instance, if the concurrence of Salzburg region and Bavaria visits are distinctively more frequent than Salzburg region and Bratislava region visits, that would be an indication that the Salzburg and Bavaria regions can be benchmarking partners. The Jaccard coefficient was also calculated as a second step to check the similarity of regions.

The main goal of this study is identifying destination benchmarking partners by using Flickr photo trails. The photo trails include all the geotagged photos of a

specific user. To achieve this goal, 1,854 random Flickr users who have been to Austria and their photo trails have been analyzed to identify the European destinations visited and grouped as benchmarking partners.

2 Literature Review

2.1 Destination Benchmarking

Benchmarking is a means to evaluate the strengths and weaknesses of a company as well as to compare the company with the leading company in the industry. McNair and Leibfried define benchmarking as "an external focus on internal activities, functions or operations in order to achieve continuous improvement" (1992). One of the most important steps in benchmarking is choosing benchmarking partners. Razmi et al. (2000) indicate that benchmarking partners are chosen among the quality award winners, business newspaper and magazine articles, conference speakers, consultants, industry and professional associations, and big firms in the same industry. The studies are mainly case studies and specific to one company or one industry and can hardly be implemented by others.

Kozak (2004), classifies benchmarking studies in tourism into two sectors: organization benchmarking and destination benchmarking studies. Organization benchmark studies are about the evaluation of a specific organization and its departments, which are mainly in the hospitality industry, whereas destination benchmarking studies are concerned with all different sectors in tourism such as transportation, accommodation services, hygiene, and cleanliness (Kozak 2004).

Destination benchmarking requires choosing other destinations to construct a comparison. In order to do that, international tourism statistics, industry reports, government sources, and databases that have tourism statistics, e.g. TourMIS, can be used (Kozak 2004). The main methods for choosing destination benchmarking partners include direct observation by visiting other destinations (Watson 1993) and feedback from customers who are visiting other destinations (Kozak 2004). Guest surveys that are conducted by Destination Management Organizations (DMOs) include questions about other destinations visited as well. From this information, DMO's have a chance to see their competitors in the same category. This information is then used by practitioners for creating their benchmarking partners. However, the choice of a benchmarking partner also depends on the categorization of the destination, such as cultural and historic cities and sun and beach destinations, thus the motivation of the tourists, satisfaction level, and demographics of visitors at the destination need to be taken into account (Kozak 2004). For instance, while comparing Mediterranean destinations as summer vacation sites, the length of the seaside promenade, ratio of residents to tourists and the length of beach coastline are some of the benchmarking criteria used in previous research (Kozak 2004).

There is a gap in research that focuses on the visitors of competing destinations or peer destinations, which can be benchmarking partners. However, comparison of destinations with others offering similar types of holidays is one of the best ways to evaluate your own destination and learn more about specific source markets as well (Goodall 1990).

2.2 Flickr Studies

Social media involves interaction between people who share user generated content, such as videos and photographs on virtual communities or networks like Facebook and Flickr, and enable instant feedback. Flickr includes photographs from different users who are from different places and share their photos taken in different parts of the world during their travels. Access to this site is open to anyone to view photos, though uploading photos requires membership, which is free for a basic account.

Online photo-sharing is common among travellers and Flickr, Picassa, Panoramio, and Facebook are used frequently. According to (Lo et al. 2011), 89 % of pleasure travellers take photographs of which 41 % of post them online and around 40 % of them use online photo sharing sites such as Flickr and Picassa, 76 % of them use another type of photo-sharing website in combination with these.

Koerbitz et al. (2013) show that Flickr data is representative of actual tourist numbers in Austria based on the data from Flickr with tags related to Austria and actual bednights statistics. This is an indication of the usefulness of Flickr data and can be used further in tourism research. For instance, potential tourists to a destination can search for photographs on Flickr to gain insight into this destination. Flickr data can show the densely populated areas at a destination and DMOs can take precautions for overcrowding or improve local transportation by providing more buses to those places. The Flickr data can be used to create benchmarking groups that individuals visit during their travels. For example, if a majority of the people who visit the Vienna region also visit the Berlin region, which shows there is a similarity between those regions.

In a recent study by Sun et al. (2013), volunteered geographic information is used to analyze tourist patterns regarding accommodation in Vienna. The study included seasonality analysis and results indicate that accommodation demand shows seasonality. Tourist movements in relation to regions of attractions and the topological characteristics of regions have been examined by Zheng et al. (2012). The data is collected from various websites and a database is built with travel patterns of different tourists. The analysis of tourist flows from one region of attraction to another is done by using the Markov chain model. The results show that the proposed model works well with the four major cities tested. Tourist movements in another major city, Rome, are analyzed and densely touristic areas are identified based on Flickr photos and mobile phone information (Girardin et al. 2008).

Recommendation systems based on geotagged photos is also examined. Jiang et al. (2013) investigate a method to identify tourism attractions based on geotagged photos and estimate the popularity of the attraction based on the number of users' photos. In addition the time the photo was taken and the time the next photo was taken are considered as well as the distance between the two attractions to see a user's travel behaviour. By taking all the previously mentioned facts and the contextual information into consideration, a recommendation system is developed. The results using geotagged photos from Panoramio indicate that the system performs better for users with travelling history.

Mamei et al. (2010) create an intelligent recommendation system that can learn from past tourist behaviours and recommend places and attractions for first time visitors based on the data they retrieved from Flickr. De Choudhury et al. (2010) use Flickr data to create automated travel itineraries based on the photo trials, geolocations of the photo, the length of stay at each place, and travel time between two places where the photos were taken. Their results indicate that the automated itineraries are meaningful and Flickr data is useful in this case.

Previously mentioned research in this area shows that geotagged photos, such as in Flickr, is used in different ways. Also, there is a gap in destination benchmarking studies about how to choose benchmarking partners. Destinations can use Flickr data to see to which other destinations their visitors have been and use this information to identify their benchmarking partners. The destination benchmarking partners need to be similar in a way, such as European capitals or sun and beach destinations, which have similar tourists visiting. Thus, the regions that have the same visitors can be classified as benchmarking partners. In this study, geotagged photos from Flickr that are tagged with Austria are used to identify the benchmarking partners of Austrian regions.

3 Methodology

3.1 Data Collection and Cleaning

The data was collected from Flickr.com by an application that retrieves meta-data for geotagged photos between March and July 2013. The meta-data include the latitude and longitude of where and when the photo was taken as well as information about the user, such as the hometown of the user, gender, and occupation. The data includes the photos that are uploaded on Flickr and tagged by users with Austria and all of its regions, including Vienna, Burgenland, Carinthia, Styria, Upper Austria, Lower Austria, Salzburg, Tyrol, and Vorarlberg. The users were then categorized as residents of Austria or tourists based on their information on their user profiles on Flickr.com. Among them, 1,854 random users who have more than one photo uploaded on the website were chosen and their individual photo streams were collected. The photo streams include all the photos from an

individual user since he/she became Flickr member. Thus, the analysis is not based on one trip but the sum of all the trips taken by that user, which he/she uploaded the photos on Flickr.

The total number of photos collected for this study is 1,785,563. The photos that were taken after 30/03/2013 and photos that were taken outside the European continent were deleted from the study sample. In addition, the destinations where the photos were taken were identified and the number of times a person has been to one destination was disregarded since the focus is to identify destinations that can be benchmarked together. After the data cleaning, the study sample consists of 1,166,053 from 1,854 individual users.

3.2 Data Analysis

In order to analyze the data the NUTS regions of Europe are used for classification. NUTS stands for Nomenclature of Territorial Units for Statistics and are used for subdivision of countries for statistical purposes. For Austria NUTS 2 are the nine states and NUTS 3 include subdivision of these states, which is used to identify the city centres and touristic areas of the regions in this study.

The fitting benchmarking partner for a city or region would be the one which shares the same tourists. In order to do this, all destinations visited by the users in Europe are identified. Since, the focus of this study is to find the benchmarking partners of Austrian destinations, the destinations visited in addition to the Austrian ones in Europe are specified. For instance, the percentage of visitors who have been to Vienna and Paris in comparison to total visitors to Vienna are calculated. The higher the percentage of common tourists visiting same destinations the more likely they can be benchmarking partners. Since, the number of days spent at the destinations is more important than the number of visitors, this visits are weighted. For instance, if one person has been to Vienna five times, it is considered as five visits to Vienna.

4 Results

The majority of the users are Europeans (63.0 %) followed by Americans (28.4 %), Asians (6.9 %), Australians (1.6 %), and Africans (0.1 %). The largest nationality within the sample are Germans (16 %), followed by Italians (14 %), British (7 %), Dutch (6 %), and Spanish (5 %), which is also similar to the actual guest mix share of Austrian tourists and representative of Austrian foreign tourists. The top 5 source markets in Austria in 2012 were Germany, Netherlands, Switzerland, Italy and British.

Country level results show that, visitors who have been to Austria also went to France, Italy, and Germany, followed by Spain, the United Kingdom, and

Table 1 NUTS 3 regions benchmarking groups

Vienna	Salzburg	Tyrolian Unterland	Traunviertel
42.9 % Paris	58.9 % Munich	44.3 % Pinzgau-Pongau	60.4 % Salzburg
37.5 % London (West)	53.7 % Paris	41.7 % Munich	43.3 % Paris
33.9 % Berlin	45.1 % Prague	41.1 % Innsbruck	40.1 % Vienna
33.9 % Prague	40.1 % Traunviertel	38.9 % Berlin	38.5 % Prague
31.5 % Amsterdam	38.5 % Berchtesgadener Land	30.7 % Miesbach	34.8 % Munich

Switzerland in descending order. This shows that neighbouring countries of Austria, such as Germany, Switzerland, and Italy share the same visitors. At the city level, the distribution of places they have visited include Vienna (2.3 %), Paris (1.36 %), London (1.28 %), Berlin (1.24 %), Salzburg (1.1 %), Rome (1.05 %), Prague (1.03 %), Munich (0.97 %), and Barcelona (0.96 %).

There are nine regions (NUTS 2) in Austria. Vienna is both the capital city and the name of the region. Salzburg is a city and the region includes the surrounding areas of the city, and is well known as the birth place of Mozart. These two regions can be classified as city tourism regions since they include the major cities in Austria, which have cultural heritage, host major events and exhibitions, and are hubs for travel. Vienna is located at the centre of the European continent and Salzburg has many international train connections. The Tyrol and Vorarlberg regions are famous mainly for skiing and they can be classified as recreational tourism regions. For the NUTS 3 regions, Tyrolian Unterland is the main skiing region in winter and hiking area in summer. Traunviertel is in Upper Austria region and has touristic areas such as Hallstadt, Atterseee and Wolfgangsee, which are popular in the summer season. The Styria, Carinthia, Burgenland, Lower and Upper Austria regions are good for biking, hiking, and other nature based sports, however there are not many distinctive features for these regions to classify them for benchmarking reasons, thus the results are focused on city and recreational tourists, which include the four aforementioned regions.

Table 1 shows the percentage of visitors who have been to the four Austrian regions as well as other European regions. For instance 42.9 % of visitors of Vienna have also been to Paris, thus Paris and Vienna can be benchmarking partners. In this case Vienna has only cities as benchmarking partners, whereas Salzburg has a mix of cities and regions. For Salzburg, the percentage of visitors who have been to Munich, Paris, and Prague in addition to Salzburg is over 40 %. For rural areas such as the Tyrolian Unterland and Traunviertel regions, the results suggest that major European cities such as Paris and Berlin can be benchmarking partners as well. However, benchmarking Traunviertel with Paris would not be realistic since they differ in their size and touristic offers.

The cities like Paris, Berlin, and London, which are major European destinations, attract more visitors than Traunviertel or other regions in Austria. Thus, the

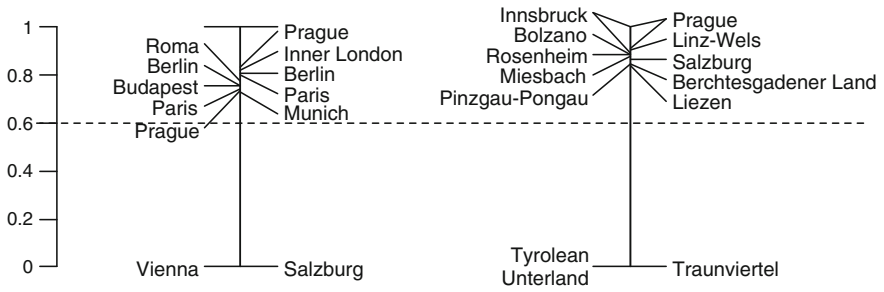

Fig. 1 Benchmarking partners identified by Jaccard-coefficient

chances are higher that visitors who have been to Austria have also been to these major touristic destinations. Taking this into account, a dissimilarity measure, the Jaccard-coefficient, is computed by using the vegan package of R (Oksanen et al. 2013). The Jaccard-coefficient is a suitable distance measure for binary data as it is asymmetric where matching zeros are not counted. Cities which are seldom visited by tourists and therefore show matching zeros are not rated as more similar in comparison to cities which occur more often together. The fitting benchmarking partner would be the one that shows the highest similarity with the target destination and have a value closer to zero.

Figure 1 shows that Vienna is most similar to Prague (0.736), followed by Paris (0.743) and Budapest (0.756). In addition, the benchmarking partners for Vienna and Salzburg are similar to the results in Table 1, which are major European cities. But for Tyrolian Unterland and Traunviertel, the partners are mostly neighbouring regions, which have similar touristic offers, such as outdoor activities like skiing and hiking.

Benchmarking destinations can also be done according to where the tourists come from and each source market can have a different benchmarking group. NUTS 2 regional results indicate that tourists can be divided into two main groups: non-Europeans who come from mainly USA or Canada and are long haul travellers and the short haul travellers, which include tourists coming from countries neighbouring Austria.

From this perspective, the results indicate that tourists who visited Vienna and are from neighbouring countries also visited more diverse destinations compared to non European visitors; though a higher percentage of non European visitors visited France and the UK than neighbouring country visitors who have been to Vienna. On the other hand, visitors to Tyrol region differ in their destination choice based on trip type (short vs. long haul). The ones that are coming from neighbouring countries also mostly visit neighbouring regions, whereas the non European visitors also visit destinations that are further away from Tyrol. In this case, Tyrol can have two different benchmark groups based on where the visitors are coming from (Table 2).

Table 2 NUTS 2 regions benchmarking groups

	Vienna (NUTS 2)		Tyrol (NUTS 2)	
Neighbouring country visitors	41.2 %	Berlin	60.4 %	Upper Bavaria
	35.6 %	Inner London	51.3 %	Berlin
	33.4 %	Ile de France	43.7 %	Eastern Switzerland
	31.2 %	Central Hungary	42.8 %	Salzburg
	31.0 %	Lazio	42.8 %	Schwaben
Non European visitors	66.8 %	Ile de France	52.7 %	Upper Bavaria
	52.5 %	Inner London	47.3 %	Veneto
	47.1 %	Salzburg	46.2 %	Ile de France
	45.9 %	Lower Austria	44.1 %	Inner London
	45.5 %	North Holland	37.6 %	Noth Holland

5 Conclusion

Destination benchmarking is an important concept in tourism in order to ensure continuous improvement. However, the literature does not clearly specify how to choose destination partners. Indications regarding the correct benchmarking partners for destinations can be found by retrieving information from Flickr and, more specifically, Flickr users. Since similar people visit similar types of destinations that can be identified as benchmarking partners, the user's country of origin and the places visited are used as similarity indicators to categorize destinations. The concurrence of visits and then the Jaccard coefficient was used to refine the categories.

The results show that city regions of Austria (Vienna and Salzburg) can be benchmarked with other European city regions, such as Paris, London and Berlin. Long haul travellers coming from the USA and Canada have also often been to different European regions that are not close to each other geographically. Thus, the benchmarking partners for this specific source market are heterogeneous. On the other hand, short haul travellers coming from neighbouring countries of Austria are mainly visiting German and Italian regions and not travelling far in distance, thus their benchmarking partners are in the same regions as the Austrian destinations.

This study shows an innovative way of using digital footprints that can easily be found on the internet to classify destination benchmarking partners. However, the study does not propose to replace the existing methodologies that are used in traditional benchmarking studies, such as data envelopment analysis. It is a new approach and interpretation of digital footprints such as geotagged photos found in Flickr for tourism industry.

6 Implications, Future Research and Limitations

Destination benchmarking is important for destination managers to see other sides by investigating their benchmarking partners and how similarly or differently they conduct business. One of the most important steps in this process is to find the right benchmarking partners. The main implication of the study is that destination benchmarking partners can be identified by using data that is freely available on the internet. The DMOs can retrieve this information and include it as an indicator of benchmarking destinations in addition to the others they normally use. New trends among tourists can be observed by this type of analysis as well, such as new points of interest or new destinations that are increasing their number of tourists. The Flickr data also shows when tourists are visiting various parts of the country and this can be used for assessing seasonality of destinations.

This study may not be generalized since the Flickr users may not be representative of the whole world population. The results could be different if the data is taken from another photo sharing platform such as Panaromio or Instagram. In addition, the data in this study includes visitors to Austria, while analyses of another country could have different results. Thus, it is recommended that this study is replicated for other parts of the world and on different platforms as well. The results of these studies can be confirmed by conducting additional benchmarking analysis with the actual benchmarking partners.

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The Adoption of Pinterest for Destination Marketing: The Case of Austrian Destinations

Christian Maurer and Bianca Hinterdorfer

Abstract The internet and social media play a major role as information sources for tourists and travellers in the travel decision making process. Since the tourism product is intangible, travellers have to rely on images and descriptions regarding travel products and services. Images are subconsciously more influencing than text. Therefore, online photo sharing platforms such as Flickr or Pinterest offer great potential for marketing in the tourism industry. This paper introduces the opportunities of Pinterest in the tourism industry and analyses its usage among Austrian destination management organisations (DMOs). The Pinterest outlets of three Austrian DMOs are analysed and benchmarked with the Pinterest website of the Swiss National Tourist Organisation. Moreover, an online survey was conducted among Austrian DMOs. The results indicate that the usage of Pinterest is still rather limited. Nevertheless, the prevailing opinion towards photo sharing websites for marketing purposes in general and towards Pinterest in particular is positive.

Keywords Pinterest · Online photo sharing platform · Social media adoption · Social media marketing · Destination marketing

1 Introduction

Nowadays for many internet users social media play an important role in their everyday lives. The development of Web 2.0 applications allow people to actively participate in the social media world with very little technological knowledge

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(Harrison and Barthel 2009). Since many customers can be reached via these applications social media marketing has become an integral part of the marketing strategy of tourism businesses and organisations (Inversini et al. 2012). In particular photo sharing websites offer great potential for marketing in the tourism industry because images are of high significance in the inspiration stage of the travel life cycle (Tnooz 2012a). The latest and fastest growing photo sharing platform in terms of user numbers is Pinterest (Hempel 2012). However, so far only few studies (e.g. Hempel 2012; Pitta 2012; Tourismuszukunft – Institut für eTourismus 2012; Tnooz 2012a, 2013) have explored its marketing potential for tourism destinations and its role in different phases of the travel life cycle.

The aim of this paper is to analyse the potential and usage of online picture sharing platforms as a marketing tool for Austrian destination management organisations (DMOs) on the example of Pinterest. The functions of the Pinterest website and its potential for marketing tourism destinations are explored. Furthermore, an online survey aims to discover the reasons for the usage or non-usage of Pinterest among Austrian DMOs. Therefore, the following research questions have been stated:

- To what extent do Austrian DMOs use Pinterest?
- What are reasons for using or not using Pinterest for destination marketing?
- In which phases of the travel life cycle is Pinterest used by Austrian DMOs?
- What features determine good practice of using Pinterest for destination marketing?

This paper is divided into five chapters. While Chap. 1 provides the introduction, Chap. 2 gives an overview of the theoretical background. Chapter 3 is dedicated to the methodology. The subsequent chapter discusses the results of the study followed by the conclusion.

2 Usage of Social Media and Pinterest in Tourism

2.1 Social Media Marketing in Tourism

Social media can be defined in different ways. According to Tuten (2008) social media are determined by the creation of user-generated content, co-creation and commenting as well as sharing opinions on Web 2.0 applications. The latter can be regarded as web pages that use a two-way stream of communication between users. In this way, internet users can socialise online and share their own user-generated content. Types of Web 2.0 applications include among others file-sharing sites, blogs and social networks (Dooley et al. 2012).

Social media emerged in 1994 when the first blogs were published. Since then the web has changed and technological improvements have set the ground for Web 2.0 applications, which have caused a shift from a read-only network to a

read-and-write culture (Gillin 2009; Michelis and Schildhauer 2012). Users can create an online presence and connect with other users with very little technological knowledge (Kaplan and Haenlein 2010). Consequently, social media has become part of the everyday's life of millions of internet users (Kaplan and Haenlein 2010). According to eMarketer (2012) 1.2 billion people worldwide used a social network site at least once per month in 2011. This number has increased to 1.43 billion in 2012 and forecasts show a further increase of 29 % until the year 2014. In general social media can be classified into three categories which are social networks, blogs and media sharing platforms (Kaplan and Haenlein 2010).

On social networking sites users create personal profiles with information such as photos, videos, audio files or blogs to connect with friends and colleagues, access their profiles and send instant messages. Social networks have gained high popularity, especially Facebook, Google + and MySpace, which are the largest ones in this category (Kaplan and Haenlein 2010).

Media sharing platforms, such as Flickr, Panoramio, YouTube or Vimeo, offer users the possibility to share predominately videos or photos. These platforms are gaining in popularity as a big part of the content shared via social media nowadays consists of photos and videos (Lanner et al. 2010). Media sharing platforms help people make content available to others, and to enable new ways of organizing photos and videos. For businesses, using media sharing platforms provide an opportunity to reach a large audience, but also facilitate posting, tagging and organisation of the visual content. However, successful implementation of media-sharing platforms for marketing benefits also requires consumer engagement beyond mere viewing of the content. The latest development of photo and video sharing platforms is Pinterest, which was founded as a closed beta version in March 2010 (Miller 2012).

As social media is gaining more and more popularity, also social media marketing is continuously growing in importance. Social media provide a high level of interactive communication and user engagement which other media are lacking. Therefore, social media can be very effective for marketing purposes. Charlesworth (2009) considers social media marketing as any online marketing strategy or tactic which uses social media as the medium for its communication, including advertising on social networks, viral marketing and social media optimisation. Moreover, social media marketing is characterised by user control, freedom and peer-to-peer communication. These new rules need to be taken into consideration by organisations in order to conduct successful social media marketing (Tuten 2008). Consequently, an online marketing strategy of DMOs should not only consist of the corporate website, but should also include marketing activities on various online channels, in particular through social media (Inversini et al. 2012). Social media marketing also offers great potential in the tourism industry as the internet is one of the primary sources where tourists seek and receive information regarding their holiday decisions (Parker 2012). According to Stickdorn and Zehrer (2009) the customer journey consists of a defined number of touch points between a customer and a service provider, which are either direct or indirect through websites, tourist guide books or mouth-to-mouth communication.

However, what has to be emphasised is that the touch points are not only important in the pre-trip phase, but are also accessed in the post-service period to share the experience or review the product. The process is divided into six key phases that take the traveller from an initial inspiration phase to a planning stage and finally to the booking and consumption of the travel experience. The consumption of the tourism service is followed by a post-travel phase consisting of reflection and sharing of the travel experience (Egger 2007).

According to the Gallup Organisation (2011) the internet is the second most important information source for EU citizens when deciding about holidays after recommendations of friends and colleagues. A large amount of published and shared data on the internet and in social networks consists of photos and images which play an important role in the tourism industry because the tourism product is intangible (Lanner et al. 2010). Thus, travellers have to rely on images and descriptions in the decision making process. Images are subconsciously more influencing than texts and descriptions, which results in a high significance of pictures for marketing activities in the tourism industry (Tnooz 2012a). Taking these factors into consideration it can be stated that media sharing platforms such as Pinterest should be of interest for marketers in the tourism industry. This can be confirmed by the popularity of many travel brands available on Pinterest. According to Tnooz (2012b, 2013) travel brands are popular on Pinterest because users are usually pinning pictures about dreams, plans and hopes for the future, which could also be their dreams and plans for travelling.

2.2 Pinterest

Pinterest takes advantage of the importance and power of images since "sight is our most powerful sense" (Rosen 2005). Images often trigger emotions and grab the attention of people without using words. Everyone who is able to see can perceive images easily. Furthermore, almost everyone who owns a camera, a mobile phone and/or a computer can take pictures, alter and publish them online, which demonstrates the ease of the image production and also implies a movement towards an image-based culture (ibid.).

Pinterest was founded in March 2010. At that point in time Pinterest was still in the beta testing state and only available upon invitation of friends and colleagues (Miller 2012). In August 2012 the site was opened for everyone to register for free (The Pinterest Blog 2012). The mission of Pinterest is to connect everyone in the world through the 'things' they find interesting based on shared tastes and interests (Pinterest 2013a). Since its launch in March 2010 Pinterest has undergone a phase of enormous growth in terms of user numbers. From October 2011 onwards a steep growth from approximately one million unique visitors to 20 million unique visitors in April 2012 could be noted. This was followed by a short period of stagnation before another growth period started in July 2012. In November 2012 Pinterest counted 27 million unique visitors (Compete Pulse 2012).

Pinterest is an online photo sharing platform which allows its users to collect, organise and share pictures from different websites. The word Pinterest is an amalgam of the two words 'pin' and 'interest'. Users can create different pinboards on which they collect images, so-called pins. Users need to install the Pin It bookmarklet in their bookmark bar in order to be able to pin images from different websites. Once this widget is installed it allows users to pick images from any website and pin them onto Pinterest. The URL of the source is automatically taken and the picture will always link back to the original website. Users can flick through boards created by other people to get inspiration and repin images to their own boards. Users can also follow other people on Pinterest and will consequently see pins of the followed users in real-time in their Pinterest home feed, which is the collection of all pins from followed pinners and boards (Pinterest 2013a, b). The application can be accessed via the URL www.pinterest.com but it can also be downloaded for free as a mobile phone application (Pitta 2012). Businesses can also create specific business accounts with verified websites and have the possibility to use Pinterest web analytics. With this tool pins, repins, impressions and clicks on one's Pinterest page can be measured (Pinterest 2013c).

Pinterest provides various advantages for businesses in terms of social media marketing. The most frequently mentioned benefit of using Pinterest for marketing purposes is the referral traffic. Whenever users pin, repin, comment or like images on Pinterest it drives traffic back to an organisation's website (Tnooz 2013). One of the most discussed downside is the usage of images without permission of the originator. Users are enabled to pin photos from any website on the internet, even if the website provider does not use Pinterest. However, Pinterest reacted to this issue and created the nopin tag, which can be included on any website in order to opt out that images are being pinned (Loren and Swiderski 2013).

Pinterest also provides great opportunities for DMOs since vacation planning usually includes a decision for a destination. The first decisions of tourists concerning a destination happen in the dream or inspiration stage, in which pictures are the most basic elements. Research has shown that images have a greater influence on decisions, dreams and aspirations than texts (Rosen 2005). Consequently, Pinterest is an effective tool for DMOs to engage users in the dream or inspiration stage and influence their decisions (Tnooz 2012a, b). Pinterest offers the unique chance for destination marketers to create imaginary worlds, which arouse customers' desires, and hence might positively affect the purchase decision of travellers (Tourismuszukunft – Institut für eTourismus 2012).

3 Methodology

A combination of an in-depth literature review and an empirical survey were deployed in order to answer the research questions in this paper. For the purpose of gaining a complete understanding of Pinterest and its usage among Austrian DMOs the triangulation approach of a qualitative case study analysis and a

complementary quantitative online questionnaire have been applied in order to gain a broader and more complete picture.

The Pinterest pages of three Austrian tourism destinations have been analysed in an explanatory form in order to gather characteristic features of good practice examples of the usage of Pinterest for destination marketing. The selection of three cases was based on a purposive approach (Veal 2006). Cases of the same sector and of comparable geographical locations have been selected. Furthermore, the decision was based on the different amounts of pins and levels of activity on the Pinterest pages in order to get a balanced view. Consequently, the Pinterest pages of the three DMOs Austrian National Tourist Office, Lower Austria Tourist Office[1] and Gasteinertal Tourist Office[2] were selected for the case study. After a comprehensive research on Pinterest, the site of the Swiss National Tourism Organisation has been selected as a benchmark case, because it operates a Pinterest page with many followers, frequent pinning and interaction with other pinners. A comparative analysis of the four cases was conducted during one day in February 2013 with a focus on the following criteria:

- general characteristics: date of the first pinned photo, language used on the site, the amount of pictures, pins, likes and followers
- update frequency: photos pinned during the last month, date of last pin
- content: topics, number of group boards, source of pinned photos

In order to answer the stated research questions a respondent-completed online questionnaire was emailed to the total population of 110 DMOs in Austria including the national, provincial and regional DMOs. The questionnaire sought to find out the participants general knowledge of social networks and photo sharing platforms for marketing activities and if, how and why Austrian DMOs use Pinterest. The questionnaire consisted of closed and open-ended questions and contained filters which resulted in different sets of questions. The participants who did not know Pinterest were asked if they use any other photo sharing platforms. Those respondents who know Pinterest but do not use it were asked about the reasons for the non-usage of Pinterest. The destination marketers who use Pinterest were questioned about their behaviour on Pinterest and reasons for using Pinterest. Finally, all participants were asked about their general attitude towards photo sharing websites and demographic questions about the DMO (e.g. location, number of available beds in the destination, number of arrivals, annual marketing budget).

The questionnaire was pre-coded and pre-tested and then published on www.limeservice.com. The link to the questionnaire was emailed to the DMOs on 4 February 2013. Frequency tables and descriptive statistics were produced for a

[1] Lower Austria is one of the nine Austrian provinces.

[2] Gasteinertal is a tourism destination in the province of Salzburg.

Table 1 Comparison of the case studies

	Austrian national tourist office	Lower Austria	Gasteinertal	Swiss national tourist office
General characteristics				
Pinterest URL extension	Austriatravel	Loweraustria	Gasteinertalcom	Myswitzerland
First pin	February 2012	June 2012	May 2012	June 2012
Language	English	German	German	English
Amount of pins	263	145	117	1.713
Followers	262	26	26	1.433
Update frequency				
Last pin	2 weeks ago	3 weeks ago	29 weeks ago	2 days ago
Pins in January 2013	7	6	0	47
Content				
Group boards	3	0	0	10

general picture and to describe the data. Moreover, explanatory research in form of crosstabs and regression analysis was used in order to test relationships between variables. The data analysis was carried out with SPSS.

4 Results and Discussion of Findings

First of all, the results of the case study analysis will be presented followed by the outcome of the online questionnaire.

4.1 Case Study Analysis

The findings of the case study analysis are summarised in Table 1.

It can be seen that the usage of Pinterest amongst Austrian DMOs is still in its early stages. The Pinterest pages of Gasteinertal and Lower Austria Tourist Office are not updated on a regular basis. The case study analysis also reveals the importance of a high update frequency and interaction with the pinners through group boards in order to achieve a high number of followers. This relationship can especially be seen in the cases of the Austrian and Swiss National Tourist Organisations, where one can find regular pinnings and the usage of the group boards. Moreover, the Austrian and Swiss National Tourist Organisations operate their pages in English whereas Gasteinertal and Lower Austria give the description of the photos in German. The different language versions might be related to the different target groups the mentioned organisations are interested in. In order to receive referral traffic back to the website, it is important to pin a high amount of

photos from the destination's website and it has to be guaranteed that all links are working. Finally, the photos should be of high quality and include meaningful descriptions to attract potential customers. Furthermore, none of the cases provides the Pin It button or a link to Pinterest on their customer-oriented website, which means users are not informed about the presence on Pinterest.

4.2 Adoption of Pinterest and Attitude towards Online Photo Sharing Platforms in General

Out of 110 Austrian DMOs 53 completed the online questionnaire, which amounts to a response rate of 48 %. The majority of the responses are from destination management organisations located in the province Tyrol (28 %), followed by DMOs in Upper Austria (21 %) and Salzburg (19 %). No response was received from the province of Vorarlberg. Only 15 % of the respondents use Pinterest for marketing activities whereas 43 % do not know Pinterest. Another 42 % know the application but do not use it. The reason why so many DMOs do not know or use Pinterest for marketing activities (in total 85 %) may be based on the fact that Pinterest was only opened to the public in August 2012 (The Pinterest Blog 2012).

The relationship between the usage or non-usage of Pinterest and several other variables has been tested using cross tabulations. No significant relationship can be observed between the province in which the DMO is located and whether Pinterest is known to them or not. Moreover, no significant relationship between the online marketing budget and the usage or non-usage of Pinterest could be observed.

Figure 1 illustrates the general opinion of the respondents towards online photo sharing websites, including both users and non-users of online sharing platforms. The interviewees were asked to rate the given statements (closed questions) on a four-point Likert Scale ranging from strongly agree, rather agree, rather disagree, to strongly disagree.

It is apparent that the biggest challenges for DMOs are providing enough photos of high quality and updating photo sharing websites regularly. However, the potential of online photo sharing platforms for staying in contact with their customers is recognised by the majority of DMOs. Moreover, more than half of the DMOs agree that online photo sharing websites contribute to a higher visibility in search engines, bring new customers and can be used as a channel for informing customers about new products and offers. Interestingly, the respondents seem to have a rather balanced opinion regarding the potential of online photo sharing websites to drive traffic back to the DMO's website.

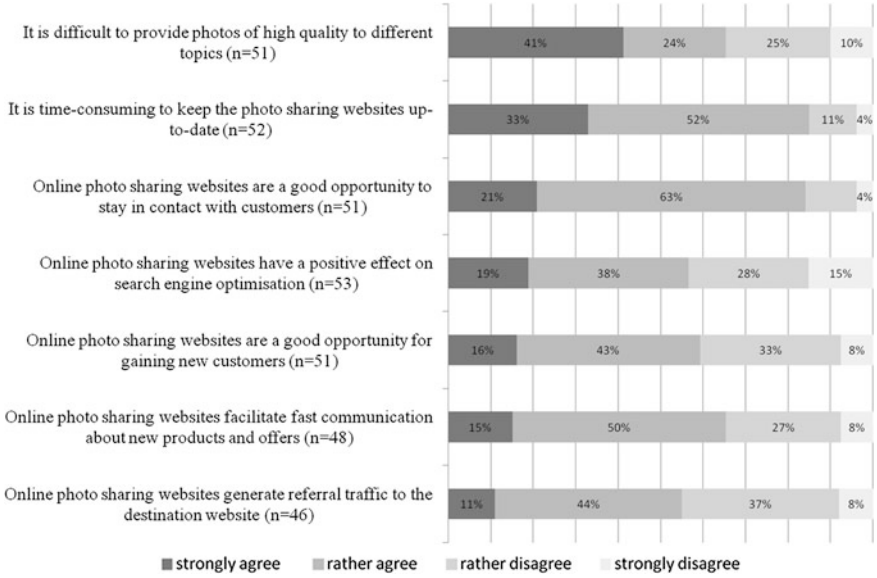

Fig. 1 General attitude towards online photo sharing websites

4.3 Reasons for not Using Pinterest

Those DMOs that know Pinterest but do not use it (22 DMOs or 42 %) were asked about the reasons for the non-usage. Figure 2 illustrates that the majority of the DMOs use other photo sharing platforms (mainly Flickr) instead of Pinterest. More than half (12) of the DMOs do not have enough staff resources to maintain this platform and three DMOs think that Pinterest is not suitable for marketing purposes in tourism. Some respondents added that they do not use Pinterest due to copyright concerns regarding the photos. Moreover, it was stated that Pinterest was quite new and that the application might only be a current hype in the social media environment.

Finally, respondents were asked about their general opinion about Pinterest. Three statements had to be rated on a four-point Likert scale (strongly agree = 1, rather agree = 2, rather disagree = 3, strongly disagree = 4). The statement that Pinterest is a suitable marketing tool for organisations reached a mean of 2.18. The statement that Pinterest is a suitable tool for marketing activities in tourism revealed a mean of 2.05. Finally, participants were asked to rate the statement whether marketing on Pinterest can increase the desires of tourists to travel to a certain destination. The analysis of these responses results in a mean of 1.82. This indicates that in general DMOs have a rather positive attitude towards Pinterest even if they do not use it.

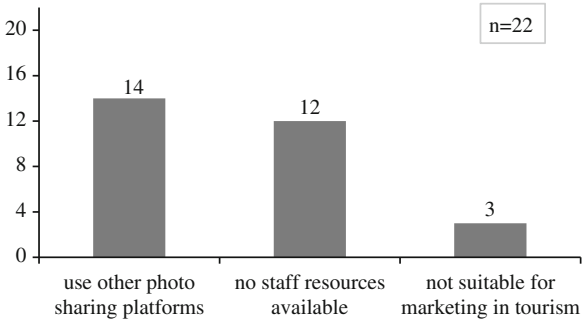

Fig. 2 Reasons for not using Pinterest

4.4 Reasons for Using Pinterest

Only eight DMOs stated that they use Pinterest. However, when it comes to the usage of Pinterest, six of the organisations that apply Pinterest are located within two provinces Tyrol and Salzburg. In total, DMOs of only four Austrian provinces out of nine use Pinterest. The two most important reasons are to gain new customers and to get more referral traffic back to the DMO's website. Other important goals are to improve the destination's image and reputation via Pinterest. Three DMOs believe that customers' buying decisions can be influenced via Pinterest. However, none of the respondents stated that Pinterest is used as a tool for market research. Although, Pinterest apparently offers great opportunities to gain insights into customers and potential customers with an onsite web analytics tool for business account users (Pinterest 2013c).

The respondents were also asked to select from a list of topics (closed question, multiple answers were possible) those to which they pin images on their Pinterest pages. All respondents stated that they pin photos about scenery and nature, followed by culinary (seven mentions), culture, sports, events and activities (each with four mentions), cities and regions (three mentions), and finally accommodation (one mention). Moreover, respondents had to rank how the six stages of the travel life cycle can be integrated on Pinterest. The majority of DMOs believe that Pinterest is best suited for the inspirational stage, followed by the planning stage, reflection, sharing, and experience stage. The suitability of Pinterest in the booking phase was ranked on last place. Nevertheless, research indicates that Pinterest can be useful in the booking phase if pictures link to the websites of tourism providers where users can find bookable offers (Tourismuszukunft – Institut für eTourismus 2012).

Additionally, the amount of photos, boards and followers of the DMOs were elicited through the online survey. The median of pinned photos on the investigated DMOs' Pinterest pages is 27.5. The median of existing boards' sums up to 3.5 and the median of the DMOs' followers is 17.5. Furthermore, the relationship between the amount of pinned pictures and the amount of followers has been tested with the correlation coefficient (r). No significant relationship could be observed

between the two variables 'amount of pinned photos' and 'amount of followers' ($r = 0.21$). Regarding the frequency of pinning photos, the online survey reveals that 38 % of those DMOs that use Pinterest pin new photos less than once a month whereas the others update their Pinterest page at least once a month. Finally, the participants of the online survey were asked about the usage of group boards and the Pin it button. 13 % stated that they use these boards and the Pin It button on the DMO website has been implemented by 25 %.

5 Conclusion

The internet has changed from a read-only network to a read-and-write culture. This transition is mainly due to technological improvements and the steadily increasing number of social media users. Nowadays users need little technological knowledge for participating actively in the social media world. Not only has social media gained a high popularity amongst users, but since the internet is one of the most important information sources for tourists social media marketing provides great opportunities for DMOs to achieve their marketing objectives.

User-generated content, one of the main characteristics of social media, nowadays consists to a large extent of photos and videos. Therefore, online photo and video sharing websites, such as Flickr and Pinterest, have become very popular and attract millions of users. On Pinterest users can publish, organise and share pictures found on the web via virtual pin boards. This website especially provides great marketing opportunities for the tourism industry, because the tourism product is intangible and therefore tourists have to rely on descriptions and images of the products and services. Images are subconsciously more influencing than texts, especially in the inspirational stage of the travel life cycle.

The case study analysis revealed that Pinterest is not yet very popular amongst Austrian DMOs. However, the benchmark case study of the Swiss National Tourist Organisation shows that the platform offers great potential for tourism organisations. The results of the online survey supported the conclusion that Pinterest is still in its early stages and not yet used by many Austrian DMOs, although, the majority of the respondents already know the application. The general opinion about Pinterest as a marketing tool in the tourism industry is rather positive. DMOs which already use Pinterest aim mainly at gaining new customers, getting more referral traffic back to the website and improving the destination's image and reputation. Both the literature review and the empirical research provide evidence that Pinterest is suited best for the inspiration stage of the travel life cycle. DMOs should engage in Pinterest activities if this platform is also used by their target customers.

As research on the usage of Pinterest in tourism is still at a preliminary stage, this study highlighted the potential of Pinterest for marketing purposes in regards to Austrian DMOs. Moreover, the number of case studies for this research was limited and therefore more data could be collected from other cases. Another

limitation of the survey is, that the focus was on Austrian DMOs and therefore the results cannot be generalised for DMOs in other countries where Pinterest might already be more popular and widely applied. Future research projects could also investigate the application of Pinterest in other tourism sectors such as hospitality or transportation.

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Activity and Influence of Destination Brands on Twitter: A Comparative Study of Nine Spanish Destinations

Frederic Guerrero-Solé and José Fernández-Cavia

Abstract Tourist destinations have started using Twitter as a new platform to provide information to travellers. However, it is still unclear what the future role of this social network is and how tourist destinations will use its characteristics to improve their influence and impact on the network. This study analyses the activity of nine Spanish tourist destinations and explores their influence on Twitter considering the number of followers, retweets and mentions. We conclude that while some of these destinations are using intensively Twitter and have a considerable influence on it, other destinations have little impact and need to improve their strategies to achieve their objectives. The study is a first step to explore the keys that explain the success of the DMOs on Twitter.

Keywords Destination brand · Social media · Twitter · Influence

1 Introduction

Social media are now important channels of communication both for commercial brands in general (Chu and Kim 2011) and specifically for destination brands (Lim et al. 2012; Ali et al. 2010). To date, in the tourist sector, some of the most popular Web-based social platforms are social networks (e.g., Facebook), photo-sharing websites (e.g., Flickr or Instagram), video-sharing websites (e.g., Youtube), review sites (e.g., TripAdvisor), blogs (e.g., aluxurytravelblog), virtual communities

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(e.g., minube.com), or microblogging platforms (e.g., Twitter). All of these online tools have been explored, tried and experienced not only by individual travellers but also by tourism services providers as well as by tourism destinations too.

However, as it happens with any new technology that comes to play, DMOs take some time to learn how to use web 2.0 tools, and how to take real advantage of them. DMOs, though, are highly interested in developing social media campaigns, as they are supposed to be capable of not only disseminating information, but also values and brand image (Park and Kim 2008). Thus, DMOs have come to use social media as part of their communication strategy, together with traditional advertising, publicity, official websites and mobile marketing.

Among other social media, two sites are especially salient for Spanish destinations: Facebook and Twitter. In these two networks, the presence of commercial brands has become a must. Facebook, the most influential social networking website in the world, has been extensively used by destinations (Stankov et al. 2010). Twitter is a micro-blogging platform that allows users to publish and share short texts than no more of 140 characters. Photos and videos can also be shared, and users can follow other users and spread their messages through the networks of contacts. The emergence of SNS such as Twitter has opened new possibilities in the field of tourist communication. Twitter has experienced a huge growth in the past years, and it currently has more than 200 million active users all over the world. Its simplicity and characteristics make it a perfect platform to quickly publish promotional and instrumental information for tourists, such as places to visit, events, news or the weather forecast. Some authors have highlighted an essential characteristic of this platform: the conversational nature of Twitter compared to Facebook (Hvass and Munar 2012).

Currently, most Spanish tourist destinations have a Twitter profile. DMOs use Twitter to inform about their offer, to report their actions and to contact actual visitors. But there are not many studies that try to assess the efficacy of such efforts. So it is still unclear what is the role played by this platform in the diffusion of contents. This is precisely one of the main objectives of our analysis: how active are tourist destinations on Twitter? How influential are they? How many followers, retweets and mentions do they have? And how interconnected are those tourist destinations on the network?

To answer some of these questions, this study analyses the activity, influence and interconnection of the official Twitter profiles of nine Spanish destination brands: @viveandalucia, @sevillaciudad, @c_valenciana, @lariojaturismo, @costabrava, @turisriasbaixas, @santiagoturismo, @Visita_Madrid and @turismodemalaga. The sample was selected following a previous research on web positioning that precisely analysed these nine destinations.

2 Background

Kaplan and Haenlein (2010) defined Social Media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content". So tourists use social networks at the moment of planning their trips, choosing a hotel of selecting a destination (Bronner and Hooh 2011) but they also use them to share experiences during the journey, to post reviews and recommendations, and to spread stories, opinions and photographs (Xiang and Gretzel 2010).

Electronic Word-of-mouth (eWOM) works differently from traditional WOM, as in the former there's no face-to-face interaction and the people involved can even be totally strangers (Sen and Lerman 2007). Furthermore, information and opinions that could be exchanged via eWOM are vastly superior in number and diversity than those generated through personal contact (Hennig-Thurau et al. 2004). The lack of personal knowledge can also allow corporations (or destinations) to use these channels for communicate their brands pretending that the messages are sent by fellow consumers or just assuming explicitly their identity and promotional ends.

Travellers use eWOM news, tips and reviews as a reliable source of information in order to diminish the perceived risk when buying online tourist services (Litvin et al. 2008; Ayeh et al. 2013). But the content of social media platforms is not under the sole sender's control anymore. Now a destination brand is shaped also by the opinions, stories, images and comments of the users of social media (Lim et al. 2012). So these authors recommend DMOs to use UGC to deliver messages that marketers want to disseminate and to regularly monitor and exploit UGC to drive brand development.

As Tussyadiah and Zach (2013) point out, a tourism experience is shaped by the interaction both in real and virtual environments, and therefore destinations should remain attentive to the way travellers use social media and to the information they publish and exchange. Nevertheless, as it has been demonstrated in the case of airline companies (Hvass and Munar 2012), tourism organizations in general lack of clear social media communication strategies as most of them are still working in an exploratory stage.

3 Method and Data

We used a common application based on the Twitter Search API and collected all the tweets created by or containing the nine usernames of the tourist destinations from December 12, 2012 to May 9, 2013. The dataset contained $N = 39{,}525$ posts, of which $NT = 24{,}049$ where tweets and $NR = 15{,}476$ retweets, from $NU = 10{,}092$ distinct users. Then, we exported the dataset to a customized database that calculates the activity, retweets and mentions of all those users in

that period, the key factors to calculate the impact on Twitter (Cha et al. 2010). In our study, we do not consider the impressions of the messages, as we evaluate impact considering the behaviour of the users, and not the hypothetical reach of the messages based on the number of followers of the accounts.

4 Results

From this dataset, these were identified: how many tweets did the destinations post, how many of them were retweets, how many times the posts of the destinations were retweeted, and finally, how many times the tourist destinations were mentioned, as well as the number of followers at the end of the period (see Table 1).

As we can see in Table 1, @viveandalucia is the most active of the nine accounts, followed by @c_valenciana and @turisriasbaixas. On the other hand, @turismodemalaga has a very low rate of activity compared to the other destinations. @viveandalucia is also the most retweeted user and the most mentioned.

From these data, we can distinguish two main typologies of users that probably obey to two different strategies in the diffusion of information:

- Active users: those that post more original messages (tweets) than retweets, such as @viveandalucia, @sevillaciudad, @costabrava, @turisriasbaixas, @santiagoturismo and @turismodemalaga.
- Active retweeters: those that retweet messages more than they post original tweets, such as @c_valenciana, @lariojaturismo and @Visita_Madrid.

This is one of the first questions a DMO has to consider when it develops its strategy in social networks. Will DMO spread its own information or, on the contrary, will distribute and retweet the information created by other sources? This decision can have a great impact on the influence of the DMO, on its image and credibility on the network, and also on the number of followers it can have. On the other hand, retweeting the information of other sources can be a way to establish formal or non-formal alliances with these sources that will spread the information created by the DMO.

Despite a very little number of DMOs being analysed, we also calculated the correlations between activity, retweets, retweets received, mentions and followers. One of the main results (see Table 2) is that the number of mentions is strongly correlated with the activity of the DMOs and the number of followers. As other studies have shown (Cha et al. 2010), the number of followers has no influence on the activity, the retweeting strategies or the number of posts retweeted; however, our research show that the number of mentions can be influenced by the number of followers an user has.

Rank of influence. Despite there are diverse metrics to calculate the influence rank of Twitter users (see, as an example, Weng et al. 2010), we developed our

Table 1 Activity, retweets and mentions of the nine tourist destinations users from December 12, 2012 to May 9, 2013

Twitter user	Activity	Tweets (RT)	Retweeted	Mentions	Followers
viveandalucia	3,494	3,276 (218)	672	5,984	26,643
c_valenciana	1,583	**692** (**891**)	119	1,734	16,661
turisriasbaixas	1,527	1,381 (146)	111	734	7,320
santiagoturismo	1,390	1,087 (303)	287	630	6,365
Visita_Madrid	1,258	**522** (**736**)	82	598	3,397
costabrava	1,093	744 (349)	400	2,027	8,013
lariojaturismo	861	**223** (**638**)	438	1,472	16,945
sevillaciudad	620	520 (100)	293	1,965	29,646
turismodemalaga	252	228 (24)	64	376	8,152

Table 2 Correlations between activity, retweets, mentions and followers

	Activity	Tweets	Retweets	RT	Mentions
Tweets	**0.947****				
Retweets	0.076	−0.249			
RT	0.608	0.634	−0.134		
Mentions	**0.822****	**0.832****	−0.103	**0.835****	
Followers	0.323	0.366	−0.160	0.581	**0.697***

$^{*}p < 0.05$; $^{**}p < 0.01$

own algorithm to calculate users influence (Table 3), based on their activity, retweets, mentions and the number of followers. The rank considers the mean followers by user in the network defined by the data collected, and assigns a weight of 0.5 to retweets and 0.75 to mentions. Afterwards, the rank is normalized.

From this rank we can conclude that the most influential account is @viveandalucia, which is also the most active, the most retweeted and the most mentioned of the nine destinations. Another conclusion is that there is no relationship between the activity and the influence of the DMO. It is particularly evident in the cases of Visita_Madrid and turisriasbaixas, two of the most active and less influential users of the network.

4.1 Intersecting the Communities of Retweeters

Another question is whether the different destinations are somehow connected. Many of the network analysis are focused on the direct connections between users, considering the mentions, replies and retweets between them. However, another way to detect whether two users are connected or not is the calculation of the intersection between the communities of retweeters of those users. From this point of view, the bigger the intersection between the communities of retweeters of two users is, the more are these users connected.

Table 3 Twitter rank of influence of the network

Twitter user	User name	Rank
viveandalucia	Vive Andalucía	150.83
sevillaciudad	Sevilla	43.57
c_valenciana	Comunitat Valenciana	29.21
lariojaturismo	La Rioja Turismo	20.06
costabrava	Costa Brava Pirineu	14.05
spain	Spain	11.10
turisriasbaixas	Turismo Rías Baixas	10.55
Santiagoturismo	Turismo de Santiago	7.83
Visita_Madrid	Madrid	3.27
turismodemalaga	Málaga Ciudad Genial	3.06

To do this, we first identified the 250 most retweeted users in the network. Afterwards, we used a customized application and identified the communities of users that retweeted a certain user. Then, we selected the 250 top retweeted users. In sum, they were retweeted 9,904 times (0,025 % of the users had the 64 % of NR, the number of retweets).

The final step was the creation of a 250 × 250 matrix (M) with the values of the intersection between communities of retweeters. That is,

$$Mi, j(Ri, Rj) = Ci \cap Cj / Ci \cup Cj \quad (1)$$

where *Ci* and *Cj* are the communities of users retweeting users *Ri* and *Rj*, respectively, and *Mij* ranging from 0 (no intersection) to 1 (total intersection).

The values of the intersection matrix *Mi*, *j* were then imported to Cytoscape to create the resulting network. The vertices of this network are the 250 most retweeted users, and the edges are the intersection of the communities *Mij*. We selected only those intersections with a value bigger that 0.05 (similarity threshold) and identified 6 clusters, 204 nodes (of the 250) and 1,224 edges. Obviously, because of the process of data collection, that considered those messages created by the DMOs or that contained their usernames, the nine DMOs were among these top influential users, as shown in Table 3.

From Fig. 1 we can conclude that the destinations are poorly interconnected, and that there are very few users that retweet posts from different destinations. In particular, we have to mention the weakness of the cluster of the Galician DMOs @turisriasbaixas and @santiagoturismo. However, there is an exception in the case of Andalusia: the three Andalusian destinations (@viveandalucia, @sevillaciudad and @turismodemalaga), are interconnected by their communities of retweeters.

We also have to note the presence of some users of the network (@Spain, @minube, @guiarepsol and @marilarv) that link the different geographical clusters. In particular, the official account of Tourism of Spain (@spain), with more than 80 thousand followers, the company minube (@minube), focused on tourism

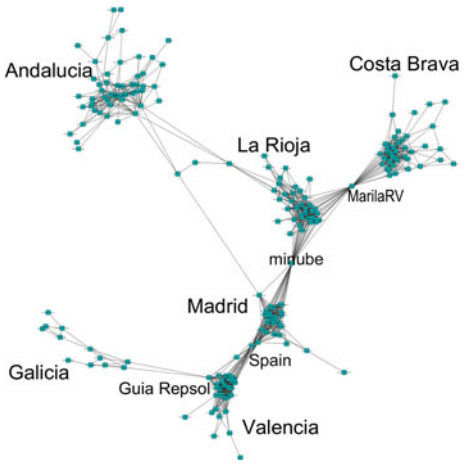

Fig. 1 Network of the most influential users considering the intersection of their communities of retweeters

information, with around 40 thousand followers, and Guia Repsol (@guiarepsol), with around 21 thousand followers. In our network, they play the role of bridges between clusters of users.

5 Conclusion

We can conclude that the destinations strongly differ in their activity and influence. The most active and influential are the Andalusian accounts @viveandalucia and @sevillaciudad. In contrast, the official account of Madrid, although it is one of the most active accounts, has a very little influence on Twitter because of the few number of followers it has. In fact, it is the destination with less followers among others analysed in this study.

Consequently, these results are not always consistent with the level and dimensions of the DMOs responsible for the promotion of the destination brands. The first level—region or, in the Spanish governmental organisation, autonomous community—is represented in the sample by "Andalucia", "Comunitat Valenciana" and "La Rioja". These three destination brands are quite well positioned in the ranking, so we can assume an active participation in Twitter by the corresponding DMOs. The second level is provincial, an area or territory smaller than a region, and is represented in the study by "Costa Brava Pirineu" and "Turismo Rías Baixas". They position number five and seven in the ranking, according to their dimensions and importance.

The third level is city, which is represented by Sevilla, Santiago de Compostela, Madrid, and Málaga in our sample. The best position is for Sevilla, which is a strong tourism brand. However, as we have already mentioned, the position of Madrid, the capital of Spain, does not align with the relevance and importance of

the brand. Consequently, it is necessary to deeper analyse the reasons certain DMOs have a very weak influence on Twitter despite of their dimension.

From our method of calculating the intersection of retweeters, we can also conclude that, in general, the Spanish destinations are poorly connected to each other. We can observe a connection only when the destinations are geographically close.

5.1 Discussion and Implications for Future Strategies of DMOs in the Diffusion of Information

The method we have developed is only an indirect way to calculate the interconnectivity between Twitter users. We are also interested on what types of information users retweet from the tweets of tourist destinations, what types of information and from whom the tourist destinations themselves retweet. Do they have preferred sources of information? Do they have permanent retweeters? What are the dynamics of diffusion of their information? How can they achieve their objectives and increase their impact on the network? In this sense, considering that the creation of a broader network may be one of the main objectives of the destinations, the diffusion of the information posted by the tourist accounts is as important as the information of other accounts retweeted by them. Considering the results of our research, we suggest some strategies to the Spanish DMOs to increase their influence on Twitter:

1. **Find a balance between posting and retweeting**. DMOs need to improve their strategies of tweeting and retweeting and find a balance between posting their own information and the information of other sources that can be related to their objectives (museums, theatres, tourism companies, administrations and so on). Considering that the influence of the retweets on impact is bigger than the influence of activity, DMO should find strategies to foster the retweeting and the diffusion of their posts.
2. **Promote formal and non-formal agreements with other users**. In this sense, DMOs should promote their relationship with other Twitter accounts that can retweet their messages and, consequently, make their visibility and influence on the network increase.
3. **Promote conversations and the mention of their account**. Mentions also have an influence on impact and visibility. Consequently, DMOs need to increase the mentions of their accounts that, at the same time, can have a positive impact on the number of followers.
4. **Have information about the users that retweet DMOs messages and mention their accounts**. DMOs need to know who retweet their posts, as well as the activity and the number of followers of these users. Considering the viral nature of the diffusion of information on the network, this is a critical point if they want to improve their impact.

5. **Disseminate information of other DMOs**. Despite the obvious and legitimate competence between DMOs, they should try to make an effort disseminating the messages of the rest of DMOs and establishing strategic alliances transcending beyond the geographical boundaries.

This study is a first step in analysing the impact of the tourist destinations in Twitter. Although we have not yet finished the process of research, we have also analysed the content of the tweets posted by them and found the subjects they talk about: music, concerts, museums, festivities and different kinds of events that can be of interest of the travellers. We have also identified the more used hashtags by the destinations and the number of links in their posts, as well as the language they use in writing their posts. This content analysis will complement the network analysis we have already implemented, will allow us to detect the best strategies in the use of hashtags, links, multimedia and multiple languages in Twitter and will help us find some clues in the success of DMOs on Twitter.

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Part III
Emotion and Sentiment Analyses

How Emotional Do We Get? A Closer Look into the Trip Advisor Dialogue

Astrid Dickinger and Lidija Lalicic

Abstract In light of the rapid development of social media industry players need to become more strategic in their online interactions with tourists. Research on online reviews and how to best respond to them is inconclusive. Therefore, the first aim of this study is to gain an understanding of the presence of emotions in hotel reviews and manager responses. Second, this study investigates how the level of emotions of online hotel reviews and online management responses vary according to hotel classification and review rating. Conclusions are drawn from a quantitative text analysis on 440 reviews and 440 responses from Trip Advisor. The results suggest that management significantly need to consider strategies for online dialogue in order to retain satisfied customers as well as a positive online reputation.

Keywords Emotions · Analysis of blogs and reviews · Quantitative content analysis

1 Introduction

Social media have evolved rapidly into major opportunities and challenges for businesses in the hospitality and tourism sector (Sparks et al. 2013). One of the significant effects of the social media development is the opportunity for tourists to communicate key attributes and experiences related to sights, accommodations and destinations. This implies that marketing content is not only communicated

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through marketers anymore (Sparks et al. 2013). The customer is increasingly gaining power and control which forces organisations to enter into a dialogue with them (Brinkhorst and Dekker 2009). Consequently an increasing number of service providers have started to take an active role in social media information exchange by responding to tourist reviews on review websites such as Trip Advisor. Revinate's (2011) study shows a significant interest of tourists (71 %) perceiving a management response as important. Menon and Dubé (2007) show that consumer's base their service evaluations on provider responses to a certain extent. According to Hong and Lee (2005) responding and interacting with the customer has spill-over effects such as customer loyalty, satisfaction and positive electronic word-of-mouth. Therefore, for businesses this post-purchase phenomenon is of special interest (Soscia 2007).

Hence, service staff should be able to identify customer emotions and related coping styles and employ a targeted approach to recovery strategies (Tsarenko and Strizhakova 2010). Managing the above mentioned online dialogue successfully becomes a competitive tool of service organisations. Richards and Hackett (2012) show that the ability of service providers to regulate emotions is beneficial in fostering strong relationships with customers. Additionally Kernbach and Schutte (2005) find that the ability of a service provider to accurately, and effectively perceive, express, understand and regulate emotions in him or herself and others is a significant determinant of customer satisfaction. The dyadic interaction between the service provider and the customer and the influence of emotions in the customer role becomes more important in the era of social media (Mok et al. 2008). However, there is a void in research regarding tourists' dissatisfaction cognition, emotions and coping strategies in the form of complaint actions following dissatisfaction with the performance of a tourist product (Donoghue and de Klerk 2012; Harrison and Beatty 2011). Furthermore, there is a lack of understanding about service provider responses, coping strategies and service recovery strategies in this particular setting. McColl-Kennedy et al. (2011) argue that marketing research and practitioners are interested in better understanding customer emotions, especially negative emotions as they are often present in customer-employee interactions. Therefore, the study at hand will (1) analyse tourist emotions in online hotel reviews (2) detect service provider responses (3) provide insights in the current online dialogue on third-party review websites. Menon and Dube (2000) postulate that training service personnel to respond appropriately, especially in the context of negative emotions, is not a one-shot effort. Service staff first needs to learn how to recognize, monitor, and control their intuitive response that is divergent to customer expectation (Menon and Dube 2000). Therefore, it can be argued that the study at hand contributes to the understanding how to monitor customer emotions, and become aware of personnel's emotion regulation in the online dialogue in social media spaces.

2 Literature Review

2.1 Computer-Mediated Communication

The Internet allows tourists to express their experiences with services, products and other resources provided by tourism destinations. It has been argued that one of the main characteristics of Web 2.0 is the creation of user generated content (UGC). Munar (2011) demonstrates that when tourists return from their holiday they upload text presenting their opinions and memories of the travel experience. The review genre is based on the critical evaluation of a tourism product or experience and acts as recommendations for potential tourists. Tourist namely air their personal reflective considerations, containing their impressions, beliefs and attitudes of their tourism experience (Munar 2011; Maurer and Schaich 2011). For that reason review websites, blogs and so on act as virtual mediators.

This kind of recommendation is one of the most important types of information for tourists interested in travelling, and perceived as the most reliable information source for potential tourists (Dickinger and Mazanec 2008). The interaction with the service provider through these online review platforms is positively associated with the actual sales of hotel rooms (Ye et al. 2009). However, the interaction with computers instead of humans for communication can elicit profound changes to individuals' internal states and a business organisation (Shank 2013). This is especially true since CMC is nowadays the first primary method of interaction (Shank 2013). It has been argued that CMC creates freedom to express opinions and experiences due to its anonymity and indirect way of communication (Derks et al. 2008). Consequently, CMC is packed with emotions despite the absence of emotional embodiment as opposed to face-to-face communication; CMC reinforces the expression of emotions (Derks et al. 2008). Positive emotions are expressed to the same extent in both communication types, whereas in online communication more negative emotions can be found (Derks et al. 2008). Shank (2013) reveals that computer identity alters the impression of the organisations' responsibility and control. This results in more moderate reactions for computer interactions, reactionary behaviour justice and evaluation impressions (Shank 2013). Therefore, the understanding of the use of CMC by tourists and its impact on tourists' experiences becomes even more important (Walls et al. 2011; Han and Jeong 2013). Online web-based service encounters are likely to be evaluated on the basis of respectfulness, appropriateness of communications, and level of care provided by service representatives, which stresses the importance of the study at hand (Shank 2013).

2.2 Expressed Emotions

Expressed emotions reflect tourists experienced emotions which are written down and well-over though when expressed (Miao et al. 2011). Han and Jeong (2013) reflect the fact that expressed emotions are antecedents of customer satisfaction, willingness to return, word-of-mouth and loyalty intentions; these are all fundamental goals for every business. Han and Jeong (2013) support the notion that overall service quality and image are cognitive components contributing to eliciting favourable and unfavourable consumption-based emotions. Han and Jeong (2013) argue that consumption emotion can be defined as affective responses generated by specific consumption experiences. Despite that, a debate about the basic emotions has been going on for a long time among researchers. Common agreement can be found in the fact that emotions are short-lived, direct, intense reactions to events that happen in an individual's environment (Beedie et al. 2005). Researchers additionally argue that emotional responses are under the influence of cognitive processes (Han and Jeong 2013), meaning that emotions can affect individuals' thinking and behaviour which will lead to long-term consequences for quality of life (Fredrickson and Losada 2005). Han and Jeong (2013) argue that there are two kinds of consumption emotions, which are positive emotions and negative emotions. Han and Jeong (2013) discuss the measurement of emotions and developed an emotional scale with comfort, annoyance, stimulation and sentimentality as basic emotions in an up-scale restaurant setting. Van Dolen et al. (2004) argue that there is overrepresentation of negative emotions when capturing customer emotions. This implies an ongoing discussion consensus regarding fundamental human emotions and their causes. Ultimately, many authors agree on six basic emotions, which are *joy*, *surprise*, *fear*, *anger*, *sadness and disgust* (Lazarus 1991).

2.3 Customer Emotional Responses

Donoghue and de Klerk (2012) argue that the cognitive appraisal approach, introduced by Lazarus and colleagues, is an especially relevant approach for understanding the emotional responses of consumers in the marketplace. Watson and Spence (2007) argue that it has been applied in various disciplines to understand peoples' emotions and behaviour when they are confronted with a stressful situation. The cognitive appraisal theory observes the fact that emotions arise in response to appraisals one makes for something of relevance to one's well being, and once elected, emotions prepare one to cope in an adaptive manner (Soscia 2007). During the first appraisal part, the consumer determines if the encounter is harmful or threatening, which as Donoghue and de Klerk (2012) argue reflects primitive, simple emotional consequences. The secondary appraisal is a complex evaluative process according to Donoghue and de Klerk (2012) which takes available coping options into account; the customer will apply a particular

coping strategies or a set of strategies effectively. The specific emotions that result from cognitive appraisal vary according to the acknowledgment of accountability for the stressful situation (Soscia 2007). Lazarus et al. divide the coping between problem-focus coping where consumers attempt to manipulate the environment to reduce stress by e.g. writing on a review website, or emotion-focus coping where consumers aim to reappraise the environment and inform their social network about the experiences. A third coping strategy has been identified by Kim et al. (2010), known as avoidance, where the customer simply does not voice his compliant and remains silent. Coping strategies strongly relate to the consumers' competence to deal with emotions, which can be perceived as a set of social skills that involves the management and control of intrinsic emotions as well as emotions elicited from a given interactional exchange (Mok et al. 2008). According to Tsarenko and Strizhakova (2010) this can provide insights into customer's affective response and one's accuracy in emotional appraisal and management.

2.4 Service Provider Responses

Literature on the interpersonal view of emotions indicates that the salespersons' instinctive responses to customer emotions may depend on the nature of the emotion (Menon and Dube 2000). However, in order to respond with an appropriate expression of emotions, emotional display rules might be taken into account by organisations. According to Diefendorff et al. (2005) this increases the likelihood that employees will need to actively regulate their emotional displays. As Richards and Hackett claim that emotion regulation may be beneficial in facilitating social exchange and make interactions between service providers and consumers more predictable. Service providers' reappraisal has the potential to reduce the experience of negative emotions and allows for more constructive social interaction (Richards and Hackett 2013). Conclusively, it can be argued by recent studies that an accommodative response evokes positive cognitive responses and a favourable effect on how consumers evaluate the company (van Noort and Willemsen 2011). Different studies have put emphasis on the impact of service interaction quality in relationship with satisfaction and relationship building (van Dolen et al. 2004; Mok et al. 2008). Service providers' possibilities to respond are categorized in four forms; instrumental, emotional, hybrid and no support. According to Menon and Dubé (2007) instrumental support of the service provider actively attempts to alter the situation and enable movement towards the particular goal. Whereas the emotional support extends empathy and understanding while showing affiliation and reassurance and aiding in an individual's emotion management (Menon and Dubé 2007). The hybrid response is a combination of emotional with instrumental support, especially for angry customers this should lead to higher service evaluation (Menon and Dubé 2007). Additionally they argue that companies need to log and formally thank the customer when they receive compliments by the customer.

3 Theory Development

The expression of tourist holiday experiences through CMC allows the customers to be more open in opinion expression and more extreme (Derks et al. 2008). According to Soscia (2007) coping perspectives suggest greater differentiation among negative emotions than among positive ones due to their emotional regulation. Research has shown that there is a greater variety of response options to cope with potentially bad situations than is needed to cope with potentially good ones (Soscia 2007). As Donoghue and de Klerk (2012) show, specific emotions such as anger and disgust are often much more strongly linked to behaviour of dissatisfaction which would appear to be an important variable in linking product selection with negative outcomes such as negative word-of-mouth and complaining. The current study expects, thus, a higher level of expressions containing negative valence in online hotel reviews:

H1: *There are more negative valenced expressed emotions than positive valenced expressed emotions in online hotel reviews.*

According to Giardine and Frese (2008) research confirms the fact that if one person in an interaction expresses positive or negative feelings the other person tends to experience a corresponding affective state. Different researchers postulate the concept of emotional contagion, which is defined as individuals 'tendency' to mimic and synchronize facial expressions, vocalizations, postures and movements with those of another person and, consequently, to converge emotionally. Menon and Dube (2000) show that a majority of salespersons' response to anger were mimicking customer displays of anger. Controversially, Dasborough and Ashkansay (2002) postulate that the online world allows service providers to respond in more constructive ways with a reduced level of negative emotions because they have time to consider their response. Therefore, the study at hand expects the following:

H2: *Services providers' responses are emotionally regulated and thus contain fewer negative valence expressed emotions, but merely contain positive valence emotions.*

Additionally the rating system at the third-party review website Trip Advisor can be a parameter for understanding customers emotion regulation as it is perceived as a venting tool for complains. Negative emotions arise in events of dissatisfaction which can stem from provider lame or basic service failure, thus, angry customers display certain behaviour (Menon and Dube 2000). Tourists can rate their experience according to a rating scale and it can be expected that emotions vary according to overall ratings on Trip Advisor:

H3a: *A high level of negative valence expressed emotions can be found in low overall review scores, and high level of positive valence expressed emotions can be found in high overall review scores.*

In the event of negative reviews or complaints the natural response from a hotel may well be to not provide support or help. Although angry customers would expect apologies or compensations they were faced with mimetic responses to their anger (Menon and Dube 2000). Research in the field of psychology shows that display of anger by one party is a threat and leads to a display of anger by the other party, making it a very contagious emotion. Service recovery literature deals with the design and delivery of positive provider response strategies. Thus, if a review is negative, a rather cheerful and positive answer should follow in order to keep satisfied customers, whereas a positive review receives a positive response to confirm the customers' feelings, therefore we suggest:

H3b: *The level of valence expressed in emotions displayed in management responses and the overall review score is not related.*

In a five star hotel one would expect positive emotions regarding the experience and in the event of a service failure very harsh criticism as this is unexpected in a well rated hotel (Hypothesis H4a). The ability to show positive emotions is a marketable product/service attribute in the service industry (Van Dijk et al. 2011). Consequently successful service providers can identify the emotional state of a customer and also classify the emotion they are in. Accordingly, service personnel in higher class hotels are well trained and can better handle responses to negative reviews, which results in Hypothesis H4b;

H4a: *The hotel classification is not related to the valence level of expressed emotions in tourist reviews.*

H4b: *The hotel classification is related to valence level of expressed emotions in service responses: high class hotels have more positive valences, whereas low class hotels have more negative valence responses.*

4 Methodology

4.1 Sample Selection

Data was collected from the review website Trip Advisor in March 2011. Trip Advisor is an online review site with globally more than 50 million monthly visitors (Kim et al. 2011). The dataset contains 440 reviews and 440 responses. A maximum of ten reviews and responses were randomly collected from the 91 cities in the world with most tourist arrivals (Bremner 2010). The data collected contains the review, the management response to the review, the overall rating the reviewer provides, the star rating of the hotel and overall ratings. Furthermore, Trip Advisor asks reviewers for ratings regarding value for money, location, sleep quality, room, cleanliness and service, which are also part of the dataset for this research.

4.2 Emotions Measurements

Guests' emotional reactions to a hospitality service experience are an additional predictor of loyalty behaviour which goes beyond simple attribute or operational ratings. They postulate that text does not only communicate informative contents but also attitudinal information including emotional states. According to Han et al. 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 the structural dimension approach that assumes that emotional states are related to one another in a systematic manner rather than independent of one another. However, Han et al. postulate that this way is not sufficient to assess the entire domain of consumption-based emotional reactions. Laros and Steenkamp (2005) additionally propose to introduce a hierarchy of consumer emotions since emotions can be considered at different levels of abstraction (most general, basic emotion level, and subordinate level). Due the discrepancy of emotions theories in general as well as in tourism studies in combination with the rather explorative setting of this paper, the study at hand decided to use the main six identified basic emotions as guidance. This study applies a categorical approach based upon six basic categories of emotions; *joy*, *fear*, *sadness*, *disgust*, *anger and surprise*. As Laros and Steenkamp (2005) argue, basic emotions allow the understanding of consumers feeling effectively.

4.3 Content Analysis

The content analysis is carried out using the software package WordStat. WordStat compares a list of words selected by the researcher (dictionary) against the text loaded into the software and returns the frequencies with which these words occurs in the texts (Pollach 2011). The dictionary is developed based upon words expressing the basic emotions; a contend summary of the main key words can be found in Table 1.

5 Results

5.1 Descriptive Results

Through the use of a running tally of category occurrence, the final output consists of the categories and the percentage of words that are assigned to each category. Investigating the frequencies we find that joy (54.3 %, 3,367 words) is the most frequent emotion in the overall corpus of text, followed by surprise (30 %, 1,857 words), sadness (5.5 %, 342 words), anger (5.1 %, 313 words), disgust (3.8 %,

Table 1 Emotions and related key words

Emotions	Key words
Joy	Cheerful, comfortable, enjoy, compliments, pleased, appreciate, delightful, enthusiasm, fun, glad, favour, good, happy, joy, joyful, nice, pleasant
Fear	Abhorrence, agitation, angst, anguish, anxiety, apprehension awe, concerns, creeps, despair, despondency, discomposure dismay, disquietude, distress
Sadness	Depress, disappoint, dissatisfy, grief, miserable and regret, comfortless, hopeless, somber, inconvenience, miserable, sorrowful, sorry
Disgust	Afraid, aghast, alarm, anguish, anxiety, blush, crisis, dangerous, desperate, disgust, disgusting, dislike, distress, dread, dreadful, envy, fear
Anger	Annoyance, hate, irritate, unkind; arrogance, attack, beaten, demolish, complain, critique, cry, destructive, disagreement, discontent, exasperation
Surprise/ glory	Admire, attractive, fantastic, magnificence, amazing, excellent, extraordinary, gracious, magnificence, splendid, wonderful

233 words) and fear (1.4 %, 84 words). This reflects a high level of positive valence emotions in reviews as well as in responses. Nevertheless, sadness can be seen as the third ranked emotion and has negative valence.

5.2 Hypotheses Test

Table 2, indicates which type of emotion is used in reviews as opposed to responses. A Chi square-test shows significant differences regarding all emotion types. The high level of surprise is mostly accountable to reviews, whereas the use of joy is significantly more frequent in responses. In terms of anger and fear the reviews score higher than responses. Hence Hypothesis 1 is not supported; there is a significant higher level positive laden emotions (surprise and joy) than negative (anger and disgust) ones. Hypothesis 2, expecting less negative valence emotions to be found in service provider response is supported by the small percentage of words reflective of negative valence (fear, disgust and anger).

In Table 3 the column signifying 1 means bad overall rating, 2 indicates average rating and 3 indicates good overall rating on Trip Advisor. The results show some degree of consistency in that if a review is good it contains elements of surprise and joy expressed by tourists. If the overall rating is negative it also contains significantly more terms expressing disgust, sadness and anger. An example is: '*I will never stay at that a hotel again it was horrible service*'. Hence the hypothesis H3a is supported as seen in Table 3. Interestingly is the level of joy is stable among the three rating levels for the reviewers. When looking into the results for manager responses we find that when a review is positively rated we also find positive tonality in the responses with over 50 % of joy related expressions, see Table 4. An example is '*Thank you so much for such a nice review*, *we are delighted to learn that you enjoyed your stay at us*'. This would hint at the fact that management shows some 'mimicking' behaviour. However, when a review is

Table 2 Percentage of emotions by reviews and responses

	Review (%)	Response (%)	Chi2	P(2-tailed)
Surprise	46.1	14.4	1,172.01	0.00
Joy	34.7	73.3	1,917.39	0.00
Anger	7.9	2.3	201.05	0.00
Disgust	6.3	1.3	164.14	0.00
Sadness	4.2	6.8	181.81	0.00
Fear	0.8	1.9	48.88	0.00

Table 3 Chi square-test–emotions in reviews and trip advisor rating

	Column (%)				Row (%)			
	1	2	3	Chi2	p	1	2	3
Surprise	23.1	38.7	53.9	254.49	0.00	16.8	11.5	71.7
Joy	43.2	42.8	37.2	4.77	0.19	33.5	13.5	52.9
Anger	12.7	8.4	4.1	40.20	0.00	53.7	14.5	31.8
Disgust	12.7	4.1	2.4	86.00	0.00	68.1	8.9	23.0
Sadness	7.2	5.0	1.8	33.00	0.00	57.0	16.4	26.6
Fear	1.0	1.0	0.6	0.41	0.06	38.5	15.4	46.2

Table 4 Chi square-test emotions in responses and trip advisor rating

	Column (%)				Rows (%)			
	1	2	3	Chi2	*p*	1	2	3
Surprise	23.5	39.7	**57.3**	4.391	0.222	33.1	10.4	56.5
Joy	28.6	32.5	28.0	8.039	0.045	33.1	13.1	53.7
Anger	15.1	9.6	4.5	23.92	0.00	**62.0**	14.1	23.9
Disgust	15.2	4.7	2.6	22.73	0.00	69.0	14.3	16.7
Sadness	7.6	5.8	1.8	125.61	0.00	70.1	15.0	15.0
Fear	1.2	1.1	0.7	7.26	0.064	46.6	19.0	34.5

bad there is a significantly higher level of sadness expressed in the responses. So managers seem to respond to anger and disgust in an effort to resolve the situation and express their apologies. An example is '*Please accept my since apologies got the unfortunate experience you had*'. Thus, hypothesis 3b is supported, since there is no relationship between negative rating and negative emotions displayed or vice versa. However, there is room for improvement as anger is primarily to be found in responses to negative reviews. One example illustrating this: 'W*e are not magicians but just simple hotel managers*, *we are not able of increasing numbers of room after midnight*'. Thus, management should work on strategies to appropriately communicate with dissatisfied customers.

Hypothesis 4a, referring to overall hotel classification not being related with tourists' valence of the expressed emotions is partly accepted (displayed in row and column percentages in Table 5). The results indicate that for all emotions but

Table 5 Occurrence of emotions in reviews of 1–5 star hotels

	Column (%)							Row (%)				
	1	2	3	4	5	Chi2	p	1	2	3	4	5
Surprise	54.3	31.9	41.1	45.9	43.1	60.32	0.00	2.7	8.5	23.6	35.3	29.9
Joy	37.1	43.9	40.4	37.1	40.8	25.02	0.00	2.0	12.5	24.8	30.4	30.3
Anger	1.4	9.6	8.2	5.8	7.8	10.91	0.05	0.4	14.9	27.3	26.0	31.4
Disgust	7.1	9.0	6.0	5.3	4.8	4.79	0.44	2.6	17.8	25.1	29.8	24.6
Sadness	–	3.7	4.1	4.8	3.0	4.93	0.42	10.9	25.8	40.6	22.7	–
Fear	–	1.9	0.2	1.1	0.5	8.97	0.11	26.9	7.7	46.2	19.2	–

Table 6 Occurrence of emotions in responses of 1–5 star hotels

	Column (%)						Rows (%)					
	1	2	3	4	5	Chi2	p	1	2	3	4	5
Surprise	33.3	12.3	15.1	17.2	15.9	14.02	0.01	1.8	7.9	25.8	36.9	27.6
Joy	53.8	71.3	69.3	70.7	71.8	14.02	0.00	0.7	10.4	26.7	34.2	28.0
Anger	4.2	3.8	3.2	1.5	2.4	5.39	0.37	1.4	15.5	35.2	21.1	26.8
Disgust	–	2.7	2.9	1.4	1.3	5.26	0.38	–	19.0	38.1	23.8	19.0
Sadness	4.2	7.5	8.7	7.3	6.8	4.94	0.86	0.5	10.3	31.3	33.2	24.8
Fear	–	2.4	2.3	3.0	2.7	2.00	0.84	–	12.1	22.4	37.9	27.6

for disgust and fear the hotel categories exhibit significant differences ($p < 0.012$). It can be argued that disgust and fear are not dependent on hotel category. Noteworthy are the positive values for the emotions surprise and joy throughout 1–5 star hotels (looking into columns), which rejects the hypothesis. However, the row percentage indicates that mainly 4 and 5 star hotels receive the overly positive surprise comments (45.9 and 43.1 % accordingly). Hypothesis 4b, testing the level of valence of expressed emotions in management responses and the overall hotel classification is not supported, see Table 6. The differences regarding the level of emotions according to hotel classification in managers' responses shows that surprise is significantly more represented in 1 star hotels. This might be due to a surprise about good quality which might not be taken for granted in a hotel with low classification and the service provider does not expect positive comments. Joy shows significant results between hotel categories with higher rated hotels with more frequencies regarding this emotion. The other categories do not display significant results and, thus, hypothesis 4b not supported.

6 Conclusion

This study helps to understand the different emotions used in online hotel reviews and online manager responses. As Mok et al. (2008) state a study of this kind can shed light on how customers utilise their ability to manage emotions to shape and

influence their experiential outcomes of services. As Laros and Steenkamp (2005) argue different emotions can elicit different behavioural consequences, therefore service providers need to know for example which feelings elicit emotions such as sadness or anger. The high level of surprise and joy expressed by tourists indicate that Trip Advisor is not just a venting-tool for complaints, but tourists do want to express their positive experiences with the service provider (Gretzel et al. 2007; Yoo and Gretzel 2008). For managers this is an important issue to consider since tourists want to stay in touch with them. This implies the fact that the development of adequate response strategies is crucial, and as this study shows, there is still a room for improvement towards more positive valence responses. In addition, given the fact that customers regulate their emotions only in case of positive experience with feelings of surprise/glory and joy, service providers can take upon this. Customer loyalty and future repurchase intentions need to be considered as important follow-up aims. Additionally this study confirms the fact that consumers use one or more coping strategies in order to deal with their post-experiences (Donoghue and de Klerk 2012). Also this is a significant matter for service providers to deal with in an online setting especially considering right service recovery action. Additionally the crucial role of this kind of third-party review websites which are open to a broad audience should not be overseen by practitioners. Previous research shows that tourists seek their information through online review websites which can negatively affect potential hotel guests and repeat visits. Despite the contributions made in this study a set of limitations need to be considered, which open up avenues for future research. The emotions are not explored in a holistic setting and the interaction dynamics have not been in-depth considered. This implies that a more carefully text-mining approach is needed to reveal emotions of service recovery actions- theories or emotional regulations. This is needed in order to reveal the direct links between triggered emotions and corresponding emotions of providers, which has not been explored by the current study either. As Varela-Neira et al. (2008) argued there is significantly further investigation need in the field of services failures and recovery.

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Sentiment Analysis: Extracting Decision-Relevant Knowledge from UGC

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Abstract Electronically available user generated content (UGC) dramatically increased in recent years and constitutes a highly relevant information source not only for other customers but also for tourism suppliers. Customer needs and their perception of consumed products can be extracted from UGC and represent a valuable input to product enhancement and customer relationship management. A prerequisite to that end is an automatic extraction of decision-relevant knowledge from UGC with a sufficient quality. This paper presents a novel approach for extracting decision-relevant knowledge from UGC and compares different underlying data mining techniques concerning their accuracy in topic and sentiment detection of textual user reviews. The complete extraction process is implemented and evaluated in the context of the Swedish mountain tourism destination Åre.

Keywords User generated content · Data mining · Opinion mining · Sentiment analysis

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1 Introduction

User generated content (UGC), in the form of product reviews and ratings, shows a huge potential to reduce information asymmetries in tourism markets, related to product quality and customer segment specific suitability. Today, product rating and feedback functionality is offered to customers on most online travel platforms, leading to a dramatic increase of available UGC. Product reviews constitute a highly relevant information source for other customers, supporting their travel planning and decision making, as well as for tourism suppliers as a valuable knowledge base to enhance tourism service quality (Lexhagen et al. 2012). More than 65 % of users already use review sites when making up their travel decision and more than 95 % of users consider review sites as credible (Kensik and Wachowiak 2011), stressing the importance of UGC also for tourism managers. However, the arising challenge for tourism managers is to find relevant reviews and analyse them efficiently, which necessitates an automatic extraction of decision-relevant knowledge from UGC with a sufficient quality. Although, many review sites offer scalar ratings, such ratings do not provide any information on specific product characteristics that customers like or don't like. Such information is typically contained within textual reviews and has, thus, to be extracted by techniques from the areas of opinion mining and sentiment analysis (Fayyad et al. 1996; Liu 2011).

This paper presents an approach for extracting decision-relevant knowledge from UGC and compares different data mining (DM) techniques concerning their accuracy in identifying the polarity of customer opinions and in assigning opinions to product properties. More concrete, the paper aims to (1) conceptualize the overall process of information extraction from textual customer reviews of online review platforms, (2) compare different DM techniques (dictionary-based and machine learning approaches) for identifying the product property and the sentiment of an opinion, and (3) evaluate the DM techniques concerning the quality of extracted information and its practical use within a destination management information system (Höpken et al. 2011). The paper is structured as follows: Sect. 2 gives a short overview on the topic of sentiment analysis and state of the art implementations. Section 3 describes the overall process of sentiment analysis and compares the accuracy of different DM methods (dictionary-based and machine learning). Section 4 demonstrates the practical applicability by integrating the extracted information into the already existing destination management information system (DMIS) of the Swedish mountain tourism destination Åre. The conclusion summarizes main results and sketches future research agendas.

2 Sentiment Analysis

Sentiment analysis is part of the area of text mining and makes use of techniques from natural language processing (NLP), information retrieval (IR), information extraction (IE) and artificial intelligence (AI) (Witte and Mülle 2006, pp. 43–44). Typical tasks of sentiment analysis are (1) finding documents relevant for a specific topic or purpose, (2) pre-processing documents, e.g. tokenizing documents into single words, extracting relevant information, e.g. removing html code or marking words and phrases with POS tags (part-of-speech), and (3) identifying the product property and sentiment. The specificity of sentiment analysis compared to text mining in general is the object of interest within the texts. Text mining deals with the identification of general facts contained within texts while sentiment analysis deals with the identification of subjective statements and contained opinions and sentiments (Tsytsarau and Palpanas 2011). Sentiment analysis enjoyed an extensive research interest in recent years. Tystsarau and Palpanas (2011) classified approaches in the field of sentiment analysis into four categories: Machine learning, dictionary-based, statistical and semantic approaches.

Ye et al. (2009) apply machine learning techniques to the problem of sentiment analysis and compare three supervised learning algorithms, namely Support Vector Machines, Naïve Bayes and n-gram based language models. In contrast, this paper compares various machine learning techniques with a lexicon-based approach, applies the classification task to a single statement or sentence within a review instead of the complete review as a whole, and extends the classification task to the product property identification.

Kasper and Vela (2011) present an application of sentiment analysis in the tourism domain, making use of a machine learning approach, based on the classification engine of Steffen (2004), and a semantic approach, based on rules to detect linguistic parts of a sentence and, subsequently, product properties and sentiments. Interestingly enough, the machine learning approach outperforms the semantic approach concerning total accuracy. In contrast to the approach above, this paper compares various machine learning approaches with a lexicon-based approach and extends the machine learning approaches to the product property classification, as well.

Grabner et al. (2012) present an approach to extract a domain-specific lexicon of semantically relevant words together with their POS tags (part-of-speech), based on their occurrence in a corpus of pre-classified hotel reviews, and to apply this lexicon to the task of sentiment classification. The approach above focusses on the automatic generation of a domain-specific lexicon, whereas the approach of this paper makes use of an existing lexicon for sentiment classification and compares the results with machine learning approaches. The specific lexica for product property classification are created manually.

García et al. (2012) present a dictionary-based approach, annotating sentences of a review by its polarity, using a dictionary with more than 6,000 words. The sentiment score of each review has been calculated based on the negative and

positive words which appear in the review, using the mentioned dictionary. The approach of this paper goes beyond the approach above, by classifying not only the sentiment but also the product property that the sentiment is linked to and by comparing a lexicon-based approach with various machine learning approaches.

3 Methodology and Implementation of Sentiment Analysis

For the design and implementation of the process of sentiment analysis, the reference model of Hippner and Rentzmann (2006) for text mining projects was taken into consideration. The reference model includes six tasks, namely goal formulation, document selection, document processing, mining, interpretation/evaluation and usage. This chapter will cover all tasks from *document selection* to *interpretation/evaluation*. The final task *usage* is described in "Hotel Mobile Apps the Case of 4 and 5 Star Hotels in European German-Speaking Countries". In the case of sentiment analysis, the task *mining* can be further divided into two sub-tasks (Liu 2011, S. 459–517). The first sub-task aims to identify the product property mentioned in the given sentence, and the second task is to identify the polarity of the opinion (i.e. the sentiment). The identification of polarity can again be divided into (1) identifying subjective and objective sentences and (2) identifying the polarity as neutral, positive or negative (Liu 2011, S. 459–517). In the course of this research, all three sub-tasks of the task *mining*, described above, are implemented by different dictionary-based and machine learning approaches, in order to evaluate their suitability. Figure 1 shows the overall process of sentiment analysis. The different process steps and especially mining methods are described in more detail in the following sub-sections.

3.1 Document Selection

The goal of the document selection is to identify relevant documents as input to the mining procedure (Hippner and Rentzmann 2006). Typically, various review sites are taken into consideration and the relevant documents within these sites are used for further analyses. In this research the sentiment analysis is performed for the mountain tourism destination of Åre (Sweden), one of the leading winter sport destinations in Northern Europe. Before relevant opinions are extracted, a manual search for relevant review sites was conducted, containing a sufficient amount of reviews. Finally, the review sites *booking.com* (with 10 hotels and 248 reviews) and *tripadvisor.com* (with 17 hotels and 1,193 reviews) were selected. To collect relevant pages from review sites and make them locally available for further processing, a web crawler is used, fetching html pages and following contained links based on regular expressions, which have to be specified for each review site.

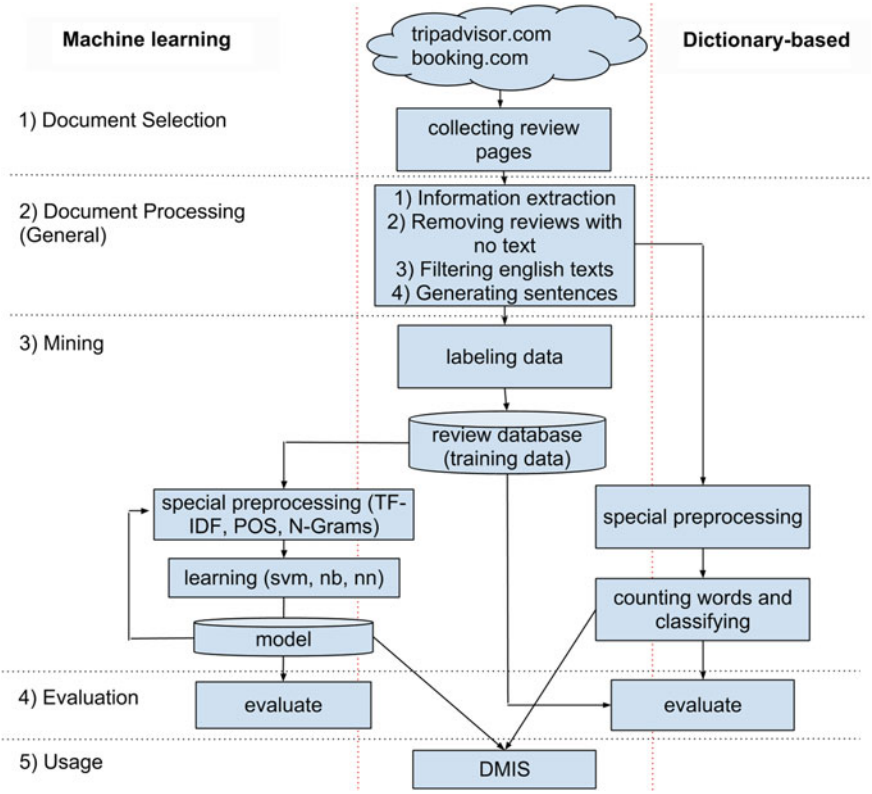

Fig. 1 Process of sentiment analysis

3.2 Document Processing

The general pre-processing of collected html documents includes four steps:

- *Extraction of opinion texts from HTML code*: HTML documents that are obtained through Web Crawling contain information that is irrelevant for sentiment analysis, like html-tags, headers/footers, etc. Thus, relevant review texts have been extracted based on regular expressions and Xpath.
- *Removal of empty reviews*: A lot of customer reviews do not contain any text but only a customer rating and were, therefore, removed.
- *Filtering of English texts*: As the developed sentiment analysis approaches are language dependent (e.g. wordlists in case of the dictionary-based approach or stop word removal and stemming in the case of machine learning approaches), the current research focuses on English texts. Thus, reviews in other languages have been removed. To filter English texts, supervised learning was used and a

Table 1 Number of reviews and statements for each review site

	No. of reviews	No. of statements
tripadvisor.com	127	1,296
booking.com	81	220
Total	208	1,516

Naïve Bayes classifier was trained, based on a small sample of texts for each relevant language as training data (reaching an accuracy of 100 %).

- *Generation of single statements*: The entire review texts are divided into single statements, based on sentence end characters as delimiters (i.e. point, exclamation and question mark). Splitting sentences into more granular statements would cause the risk to separate associated (product) properties and the information about their polarity (sentiment).

Table 1 shows the amount of reviews and sentences (statements) as output of the *document processing*.

3.3 Mining

As mentioned above, the *mining* task of the sentiment analysis process includes three sub-tasks, which are recognition of properties, recognition of subjectivity and recognition of sentiments. These tasks have been implemented both on the basis of dictionary-based and machine learning methods.

For machine learning methods necessary training data were created manually for all classification tasks (properties, subjectivity, sentiments). To use machine learning algorithms, input data needs to be transformed into a format appropriate for text mining algorithms. Therefore, sentences are tokenized, stop words removed, words reduced to their stem, and finally, a word vector is created, based on TF-IDF scores. Subsequently, the machine learning algorithms Naïve Bayes, Support Vector Machines (SVM) and k-nearest neighbour (k-NN) (Liu 2011) are applied in order to learn a model how the property, subjectivity or sentiment of a sentence can be deduced from the words occurring in the sentence.

For the dictionary-based approach, a word list (dictionary) for each class (i.e. property, subjectivity and sentiment) is needed. In this case, no model is learned but the class of a sentence is directly deduced by the wordlist the majority of contained words belong to.

Recognition of Properties. For the detection of product properties the mentioned machine learning methods have been applied to over 100 training data per class. In addition, POS tagging has been used as an optimization technique to filter nouns as good indicators for properties. For the dictionary-based approach, the wordlists for each class were generated manually, by collecting the most frequently occurring properties (and corresponding words) in all sentences of the

training data. The wordlist for each class contains three to seven words. If several classes have the same amount of occurring words within a statement, the class "More Objects" is assigned. If no word of any class at all occurs in a statement, the class "Uncategorized" is assigned.

Recognition of Subjectivity. Subjectivity recognition aims to identify statements with a subjective opinion and those without any opinion. Thus, the aim is to distinguish opinions from pure factual statements. In total, 300 training data per class are created manually as input for machine learning techniques. For the dictionary-based method, a word list containing 6,800 opinion words is used (Liu 2011). If a statement contains any positive or negative opinion words, this record is assigned to the class "Subjective". Otherwise, the class "Objective" is assigned.

Recognition of sentiment. For recognizing the sentiment of a statement (positive or negative) machine learning methods are applied to a total of 250 training data per class. Additionally, word bigrams and trigrams are used to increase the accuracy (Pang et al. 2002). In order to recognize the sentiment with the dictionary-based method, the word lists from Liu (2011), containing about 2,000 positive and 4,800 negative words, were used. In the case of no clear majority of either positive or negative words, the class neutral is assigned. Thus, the class neutral does not represent neutral opinion words, like in the study of Hu and Liu. Furthermore, negation words are considered in order to change the semantic orientation of the statement accordingly.

3.4 Evaluation

A 10-fold cross-validation is used to evaluate all machine learning models and to calculate their accuracy. The dictionary-based approach is evaluated by comparing the results with separate pre-classified test data. Table 2 shows the accuracy (i.e. percentage of correctly classified statements within test data) of all classification methods for the three tasks, described above.

Recognition of properties. The SVM method (with POS tagging) gained the highest accuracy for the classification of product properties with an accuracy of 72.35 %. However, it has to be noted that a training data set size of 100 statements per class is fairly limited and even better results can be assumed when further increasing the size of the training data set. The other machine learning techniques yielded significantly lower accuracy levels and are, thus, not competitive for the task of property recognition.

The dictionary-based approach achieved an accuracy of 71.28 %, whereby wrong assignments to the class "Uncategorized" caused the most misclassifications. This is caused by the fact that only frequently occurring words have been included in the property word lists and any statements making use of more specific wordings are not recognized. "Good Hamburgers", for example is a good indicator for the property "Food/Breakfast/Restaurant", but has not been included in

Table 2 Accuracy of classification methods

Method	Accuracy (%)
Property recognition	
SVM (with POS tagging)	72.36
Naïve Bayes (with POS tagging)	49.72
k-NN (with k = 8)	57.08
Dictionary-based	71.28
Subjectivity recognition	
SVM	65.50
Naïve Bayes	60.67
k-NN (with k = 5)	55.50
Dictionary-based	82.63
Sentiment recognition	
SVM (with bigrams)	76.80
Naïve Bayes (with trigrams)	69.80
k-NN (with k = 8)	69.60
Dictionary-based	71.28

the corresponding word list, as it occurred only once in the training data. Thus, through further enlargement of the used dictionaries even better results should be achievable.

Recognition of subjectivity. The highest accuracy of 82.63 % for subjectivity recognition was achieved by the dictionary-based method, which is significantly better than the SVM method (65.50 %) as the best machine learning approach (cf. Table 2). It might be reasonably assumed that the good results are achieved through the relatively large wordlists comprising of more than 6,800 words. Table 3 provides some examples for the recognition of subjectivity. As can be seen by the examples, problems arise if either the statements are ambiguous (e.g. "This can be a cost saver for families with children") or contain a mixture of different opinions (e.g. "The restaurant is high standard very original and lots of local products").

Recognition of sentiments. The best result for sentiment recognition is gained by the SVM method (with word bigrams), showing an accuracy of 76.80 %. A likely reason for the somewhat poorer performance of the dictionary-based approach (71.28 %) can be attributed to the fact that, in this case, an additional class "neutral" is considered if opinion words for the classes "positive" and "negative" are equally frequent. Table 4 shows some examples for the sentiment recognition. Here again we can see, that problems occur, if either statements contain multiple opinions with a different sentiment (e.g. "rooms aren't too big but very clean and comfy") or words are used in a misleading way (e.g. "All other guests I would *recommend* hotel diplomat instead").

Summary. The step *mining* of the overall sentiment analysis process (cf. Fig. 1) consists of three tasks: the *recognition of properties* (cf. p. 5), the *recognition of subjectivity* (cf. p. 6) and the *recognition of sentiments* (cf. p. 7). In this research two types of data mining methods were applied to the tasks above:

Table 3 Examples for the recognition of subjectivity

Statement	Recognized class	Real class
Hmmm must be a hospital because of that sweet smell of mould and or dead old lady	Subjective	Subjective
Would not recommend unless you have children	Subjective	Subjective
Skiing and staying in Sweden is so different to other European resorts	Factual	Factual
The restaurant is high standard very original and lots of local products	Factual	Subjective
This can be a cost saver for families with children	Subjective	Factual

Table 4 Examples for the recognition of sentiment

Statement	Recognized class	Real class
Parts of the hotel seems to be an old hospital	Negative	Negative
All other guests I would recommend hotel diplomat instead	Positive	Negative
The rooms aren't too big but very clean and comfy	Negative	Positive
Good rooms and nicely clean	Positive	Positive
Very nice breakfast room good selection for breakfast	Positive	Positive

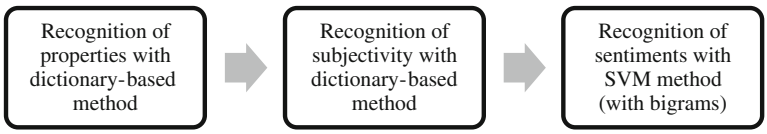

Fig. 2 Mining tasks of sentiment analysis and corresponding data mining methods

dictionary-based and machine learning approaches. In the case of machine learning methods the SVM method resulted in the best performance. Other methods, like k-NN and Naïve Bayes, didn't reach a competitive accuracy. In the case of sentiment recognition, optimization with word n-grams achieved better results, but the difference is marginal and, thus, it can't be generalized that classifications with word n-grams perform better. In the case of property recognition, filtering nouns based on POS tagging increased classification accuracy. Thus, both optimizations are worth considering for achieving better results. Surprisingly, in some cases the dictionary-based method performed better than the more complex machine learning methods. Especially for practical applications, dictionary-based methods are easier to implement and do not necessitate in-depth data mining knowledge. Figure 2 displays the three tasks and corresponding data mining methods recommended by this research study.

Overall, good and satisfactory results were achieved for all tasks of sentiment analysis. However, from an user perspective, a correct result means that statements are correctly classified in all three steps. Thus, further improvements of accuracy are desirable in order to increase final user acceptance.

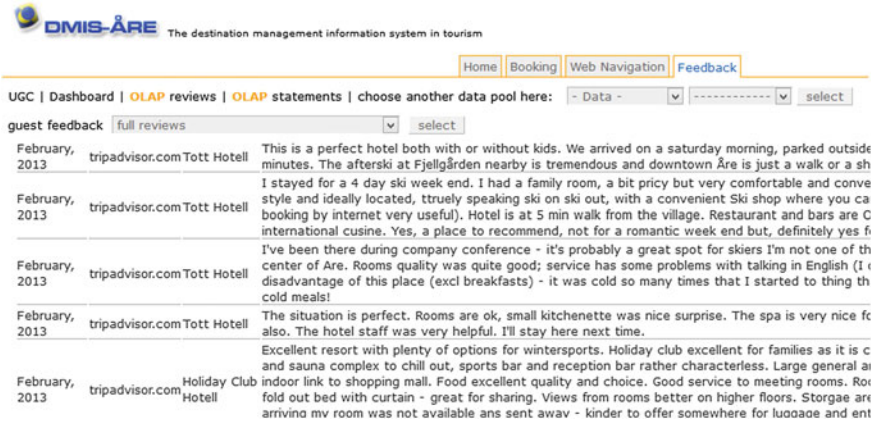

Fig. 3 Core information extracted from review sites

4 Extracted Knowledge as Input to Decision Support

As described above, the final outcome of the sentiment analysis process provides valuable information on customer reviews and opinions in a structured format. Besides data directly extracted from the review sites, like date of the review, hotel name, demographic data of reviewer (depending on review site) and the review text itself, sentiment analysis provides the product properties that the opinion is linked to, and the orientation of the opinion, i.e. the sentiment. These structured data are stored in the multi-dimensional data structures of a tourism destination data warehouse (Höpken et al. 2013) and are, thus, available for powerful OLAP analyses and data mining. Figure 3 shows parts of the structured information directly extracted from review sites, namely the date of review, the review site, the hotel name and the full customer review.

As described above, the full customer reviews (cf. Fig. 3) are split into sentences (i.e. statements) and each sentence is assigned a product property and a sentiment. Figure 4 shows an OLAP analysis, calculating the average sentiment (over all single sentences) for various accommodation providers. It has to be noted that many hotels have only a few (or even none) reviews and results might, thus, not be representative for the hotel quality. Figure 5 extends the analysis above by adding the product property as a second dimension, and enables a comparison of average sentiments across accommodation providers and product properties, demonstrating powerful benchmarking capabilities.

Based on the integration of knowledge extracted from customer reviews into the multi-dimensional structures of an overall destination data warehouse (Höpken et al. 2013), customer feedback can even be related to booking or web navigation behaviour in a cross-process analysis as shown in Fig. 6. For each country of customer origin, Fig. 6 lists core indicators of the booking process (total bookings, average booking price, average number of persons per booking, average time

Fig. 4 Average sentiment per accommodation provider

Fig. 5 Average sentiment per product property and accommodation provider

between booking and arrival and the average stay duration), the web navigation process (total clicks and total sessions) and the feedback process (total feedback answers and the average feedback value).

5 Conclusion and Outlook

Due to the increasing number of online reviews of products and services on various online review sites in recent years, it has become important for companies to capture and regularly analyze these reviews. Through the continuous monitoring of customer feedback, companies can gain valuable knowledge as input to product optimization and CRM activities, e.g. timely reaction to critical customer feedback. However, the possibility to manually analyze the huge amount of available reviews is limited. Thus, this paper presented a novel approach for automatically extracting and analyzing customer reviews from tourism review sites. The core mining task of sentiment analysis has been divided into recognition of property,

Group by attribute	Total bookings	Total clicks	Total feedback, answers	Total sessions	Average booking price in SEK	Average number of persons per booking	Average time between booking and arrival in days	Average stay duration per booking	Average feedback value
Australia	33	165	156	56	4029.485	2.606	49.100	4.818	0.859
Belgium	33	1207	130	361	5355.424	2.970	112	5.364	0.702
China	14	456	71	230	3087.250	3.500	164.500	8.786	0.859
Denmark	1830	2392	107	521	6235.034	4.527	115.609	6.144	0.778
Estonia	1080	161	16	53	4837.395	5.292	85.108	5.838	0.784
Finland	3155	4543	1039	893	7852.046	4.386	95.536	6.160	0.812
France	25	2923	12	739	4616	3.040	38.318	5.042	0.715
Germany	105	3268	150	665	5307.040	3.155	124.426	6.644	0.837
Netherlands	279	2168	150	490	7894.760	3.802	104.493	6.588	0.750
Norway	10625	27636	9093	5889	3901.213	4.911	71.890	3.297	0.767
Sweden	56073	162942	36880	39139	5023.956	3.860	83.014	5.498	0.773
United Kingdom	1042	48513	303	12843	4929.136	3.009	59.399	6.786	0.765
United States of America	30	4284	16	2307	4719.167	4.036	39.148	4.133	0.539

Fig. 6 Cross-process analysis

recognition of sentiment and recognition of subjectivity. Each of these tasks has been implemented based on two different approaches: dictionary-based and machine learning. Additionally, optimizations with word n-grams and POS tagging were considered where appropriate. Both methods could achieve good and satisfactory results: for the detection of properties, the SVM method achieved the best result with 72.38 % accuracy. Nevertheless, the dictionary-based method with an accuracy of 71.28 % is recommended for the detection of properties, due to its implementation simplicity. The recognition of subjectivity of a sentence performed best by the dictionary-based method with an accuracy of 82.63 %. For the classification of sentences into positive and negative, the SVM method could achieve the best result (accuracy of 76.80 %) with the additional use of bigrams in data pre-processing. To conclude, data mining methods are appropriate approaches to automatically extract and analyze free-text customer feedback from online reviews or travel platforms, and especially lexicon-based classification approaches are quite simple to implement while at the same time achieving good classification results. The gained knowledge can be considered as a highly valuable input to decision support, either on its own, or related to other business indicators as part of a tourism destination data warehouse, as especially shown in the cross-process analysis in Fig. 6.

Considering the whole process of sentiment analysis in RapidMiner, it is obvious that the individual process steps can certainly still be optimized. The following approaches to improve the process were not considered in this research and are, therefore, recommended as possible extensions for future research:

- Extending the wordlists, especially for infrequent features
- Using larger sets of training data for the machine learning algorithms
- Using web services to retrieve reviews from online review sites
- Dealing with spelling errors by using word similarities.

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Breaking Up is Hard to Do: Why Do Travellers Unlike Travel-Related Organizations?

Ulrike Gretzel and Anja Dinhopl

Abstract Previous studies have looked at relationship creation and maintenance between travellers and companies on social networking sites (SNSs), but have neglected relationship termination. This study examined travellers who "unliked" travel-related companies and destinations on facebook and found demographic and psychographic differences, as well as differences in characteristics related to travel planning, travel behaviour, and internet use to those who have never terminated such a relationship. Travellers have different motivations for unliking travel-related companies or destinations. Travellers routinely unlike travel-related companies for perceived faults in their social media presence (end of promotions, posting frequency or relevance), while travellers tend to unlike a destination based on offline experiences.

Keywords Web 2.0 · Social networking sites · Unliking · Customer relationship management

1 Introduction

With the advent of Web 2.0, a new marketing paradigm was ushered in (O'Connor 2008). In keeping with rapidly changing and emerging new technologies and applications, Web 2.0 marketing approaches are continually updated and extended. While always a work in progress, the underlying core of marketing 2.0 remains acknowledging and taking advantage of a more engaged and empowered consumer

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(Sigala 2007; Chung and Buhalis 2008; Schmalleger and Carson 2008; Constantinides and Foundtain 2008), as well as finding new ways to operate within the changing landscape regarding the 4-Ps, Customer Relationship Management (CRM), market research, and performance measurement (Yoo and Gretzel 2010).

Empowered consumers take part in marketing communications and co-create brand value (Vargo and Lusch 2004; Parise and Guinan 2008; Sigala 2009). This change in communication dynamics between companies and travellers has arguably put more emphasis on customer relationship management (Gupta et al. 2004; Niininen et al. 2006, 2007; Li and Petrick 2008). Social networking sites (SNSs) have become a central communication tool for CRM, connecting travellers with travel-related companies (Yoo and Gretzel 2010; Gretzel et al. 2006). Previous research stresses the importance of engaging travellers and avoiding traditional sales approaches (Shao et al. 2012).

Previous studies have looked at a variety of issues related to tie creation and tie maintenance on social networking sites (SNSs) between travellers and companies (Shao et al. 2012; Yoo and Gretzel 2010; Gretzel et al. 2006). What has received very little attention to date is tie dissolution on SNSs between travellers and companies, which should be a core concern within CRM. This paper will provide a first look at travellers who decide to terminate their relationship with companies on facebook by "unliking" them, will give insight into their motivations for doing so, and provide implications for customer relationship management.

2 Theoretical Background

CRM is a strategic approach to creating, maintaining, and managing ties with consumers and consumer segments (Payne and Frow 2005). During the process of adopting marketing strategies for Web 2.0, marketers had to vastly rethink their approach to CRM. Now referred to as CRM 2.0 or social CRM, CRM changed from "a strategy that was focused on customer transactions to a strategy that incorporated both customer transactions and customer interactions" (Greenberg 2010: 410). This means that tourism marketers needed to adjust their CRM strategies away from sales as a focus toward engaging in and managing conversations with travellers (Gretzel et al. 2006). Table 1 summarizes the differences between CRM and CRM 2.0.

Previous studies have presented insights on how marketers implement changes in their CRM strategies and how they adjust to their new role as part of a larger social network rather than the only distributor of information. In this new environment, empowered consumers expect accountability and real-time communication with companies (McKenna 1995) as well as individualized attention (Kim et al. 2003). Consumers want to be included in marketing conversations, but on their own terms (Godin 1999; Steenburgh et al. 2009; Greenberg 2010). In CRM 2.0, consumers are active participants who shape marketing messages, collaborate and co-create value through communication with each other as well as marketers

Table 1 Premises of CRM 2.0 from (Gretzel and Fesenmaier 2012)

CRM	CRM 2.0
Company to customer communication	Company to customer
	Customer to company
	Customer to customer
Delayed response	Real-time
Messages for one-off promotions	Continuous communication
Intimate relationship	Visible to others
Focus on sales	Focus on managing reputation
Personalization	Relevance

Table 2 From CRM to CRM 2.0 from (Yoo and Gretzel 2010)

CRM	CRM 2.0
One-way communication	Feedback from customer
Offline customer service center	Online customer service
Limited customer data	Customer identification with data mining
Limited C2C communication	Virtual customer communities
Delayed Response	Real-time communication

(Vargo and Lusch 2004). Yoo and Gretzel (2010) have identified the following changes in the approach to CRM for travel marketers (Table 2).

Among the Web 2.0 applications, SNSs in particular allow marketers to pull consumers to their brands. Facebook has become established as a main SNS where travellers choose to connect with companies. To that end, facebook fan pages have been increasingly used by tourism marketers (Yoo and Gretzel 2010). Facebook fan pages provide a simple and efficient way for marketers to connect with travellers, and allow for the implementation of CRM 2.0 principles. Previous studies have documented the ease of tie creation as well as the motivations for travellers to establish online relationships with companies on facebook (Gretzel and Fesenmaier 2012). At the same time, previous studies have also documented that social media strategies related to CRM 2.0 are not implemented to their full potential (Stankov et al. 2010; Hamill et al. 2012).

Because of the ease of tie creation with companies on SNSs, empowered consumers are able to control when, how, and why they want to connect with companies (Gretzel and Fesenmaier 2012). Tie dissolution is equally easy, but has hereto been studied to a much lesser extent. Also, while companies often run extensive campaigns to encourage liking, they seem to completely neglect the need to nurture these relationships. If companies implement inappropriate social media strategies, it may provide customers with an incentive to disconnect from them. Thus, because of this ease of tie dissolution, there is a great need for marketers to be aware of travellers' motivations for wanting to terminate their relationship so that such circumstances can be avoided or successfully managed.

Previous studies related to tie dissolution have looked at facebook's role in facilitating how people manage their social capital through the value of their friend connections, potentially resulting in "unfriending" (Ellison et al. 2007; Steinfield et al. 2008). Breaking ties on facebook provides a definite marker of a relationship's end, setting it apart from offline relationship termination (Sibona and Walczak 2011). It has been established as a frequent facebook behaviour between people (Madden 2012), so much so, that "unfriend" became the Oxford American Dictionary's word of the year in 2009, defined as "To remove (a person) from a list of friends or contacts on a social networking web site" (Gutierrez Lopez 2012). Previous studies have looked into relationship termination on SNSs between people (Bryant and Marmo 2009; Sibona and Walczak 2011; Quercia et al. 2012; Bevan et al. 2012; Kwak et al. 2011; Gutierrez Lopez 2012; Sibona 2013). Relationship termination with companies on SNSs was not addressed in these or other studies.

3 Methodology

Data for this study come from an online survey administered through a professional online panel provider during January 2013 in Australia, the United Kingdom, the United States, Canada, and India. The sample was limited to respondents who are travellers, that is, respondents who generally take at least one domestic or international vacation each year. A total of 3,635 valid responses were collected. Of them, 898 have ever liked a travel-related company or destination on facebook, and 127 have ever unliked a travel-related company or destination on facebook. Because of the small sample size of "unlikers", the quantitative analysis will present the results for both travel-related companies and destinations together, referring to travellers who have unliked a travel-related company and/or destination as travellers who have unliked a travel-related organization. The paper presents statistically significant Chi Square results (at $p < 0.05$ level). Respondents were also asked to elaborate on their motivations to "Unlike" in two open–ended questions. An inductive approach was chosen for the qualitative thematic analysis of the open-ended responses.

4 Results

The results suggest that unliking, or breaking up with travel-related businesses is still quite uncommon. Of the 24.7 % of travellers who have liked a travel-related company or destination on facebook, only 14.1 %—equivalent to 3.5 % of all travellers in the sample—have ever unliked a travel-related company or destination on facebook. There is some overlap. Of those who have ever unliked either, more than half (51.2 %) have only unliked a travel-related company, 32.3 % have

only unliked a destination, and 16.5 % have unliked both. The analyses focused on describing differences among those who have unliked a travel-related organization and those who have liked, but never unliked, a travel-related organization in terms of demographics, psychographics, travel planning behaviour, and Internet use as well as identifying motivations for unliking. The quantitative results are described in Sect. 4.1 and Table 3 presents a summary of all statistically significant comparisons. Results of the qualitative analysis of motivations for unliking are provided in Sect. 4.2.

4.1 Dating Profiles: Who are the Travellers that Break Up with Travel-Related Organizations?

It's not you, it's me. The results indicate differences in demographics and psychographics between travellers who unlike travel-related organizations and those who do not. Some may simply be more disposed to ending a relationship, regardless of the company's actions. Males are more likely to have unliked a previously liked travel-related organization than female respondents (16.0 vs. 12.5 %). Predilection for unliking a travel-related organization also appears to be related to age. However, there is no linearity—respondents at either end of the age spectrum (18–24 years of age as well as those 55+) are more likely to have never unliked a travel-related organization. Respondents aged 25–34 in particular are much more likely to have unliked (33.1 vs. 25.8 %). Respondents in the workforce are also more likely to have unliked a travel-related organization, while the unemployed, homemakers, retirees and students are less likely to have done so. Travellers in possession of undergraduate or graduate university degrees also have higher levels of unliking travel-related organizations. Travellers' country of residence also seems to be related to unliking behaviour: Only 10.2 % of travellers from the United States and 11.0 % from the United Kingdom have unliked a travel-related organization on facebook, compared with 39.4 % from India.

I don't do relationships. Travellers' relationship—and predilection for breaking ties—with companies on facebook may also be related to their personalities and social lives. Employing five self-descriptive sentence items for each of the five personality dimensions adapted from the International Personality Item Pool, travellers who have unliked a travel-related organization are less likely to be conscientious than other travellers, but more likely to be extraverted. They are less likely to commit: 15.0 % of travellers who have unliked a travel-related organization are in a non-committed relationship, that is, they are in a relationship but not living together, compared with 8.7 % of those who have never unliked a travel-related organization.

I'm not ready to settle down. Travellers who have unliked a travel-related organization on facebook are very active in shopping around and weighing their options before purchasing. Travellers who unlike travel-related organizations on

Table 3 Summary profile (in %)

	Have unliked	Have not unliked
Gender		
Male	52.8	45.7
Female	47.2	54.3
Age		
18–24	11.0	14.8
25–34	33.1	25.8
35–44	22.0	22.4
45–54	18.9	17.9
55+	15.0	19.1
Education		
Do not have a university degree	29.2	38.5
Undergraduate degree	34.6	29.2
Postgraduate degree	36.2	32.3
Relationship Status		
Not in a relationship	22.0	23.3
Uncommitted relationship (not living together)	15.0	8.7
Committed relationship (living together/married)	61.4	66.4
Employment Status		
Working full-time or part-time	76.4	57.5
Unemployed/Retired	7.9	25.0
Country		
Australia	18.9	21.6
Canada	20.5	21.0
United Kingdom	11.0	22.8
United States	10.2	19.6
India	39.4	15.0
Social Media/Vacation Planning Behaviour		
Typically use social media to learn about destination	66.9	60.7
Regularly use Internet for planning vacations	49.6	29.1
Regularly use Internet for social networking	76.4	44.1
Activity on a travel-related company or destination timeline	**86.4**	**79.7**
Commented on a post	31.5	19.5
Shared a post with others	29.9	21.6
'Liked' a post	35.4	31.0
Invited others to become fans	20.5	11.9
Downloaded an application	14.2	8.6
Participated in a discussion	21.3	13.5
Sent a private message to the company/destination	21.3	9.5
Travel Frequency		
Take 5+ in-country vacations/year	26.0	18.4
Take 5+ international vacations/year	6.3	3.4

facebook overwhelmingly plan their vacations online and are more active users of social media for vacation planning; 66.9 % of travellers who have unliked a travel-related organization say they typically use social media (e.g. facebook) to learn about a particular holiday destination before deciding on a holiday, compared with 60.7 % of travellers who have not unliked a travel-related organization. About half (49.6 %) travellers who have unliked a travel-related organization regularly use the Internet for planning vacations, compared with 29.1 % of other travellers. Similarly, 76.4 % of those who unliked regularly use the Internet for social networking, compared to 44.1 % of other travellers.

Travellers' relationships with travel-related organizations may be characterized by volatility, where they may be quicker than other travellers to enter into relationships with companies, but also quicker to exit them, if they no longer perceive the relationship to be beneficial to them. Travellers who have unliked also interact with travel-related companies more than others do (86.4 vs. 79.7 %), that is, they are more likely to have 'liked', commented on or shared posts, invited others to become fans, downloaded an application, participated in discussions, or sent private messages to the travel-related organizations. This suggests a deliberate effort on travellers' part to obtain information or build a relationship with organizations that are only meant to be viable for the short-term, until travellers have gotten what they needed from the company.

We should see other people. Travellers who unlike travel-related organizations value visiting different vacation destinations more than other travellers. They also travel more frequently—26.0 % take 5 or more in-country vacations per year, compared with 18.4 % of other travellers. These numbers are 6.3 versus 3.4 % for international vacations. These figures suggest that travellers who unlike travel-related organizations may just generally be more open to a variety of experiences, regardless of the travel-related company's performance. Table 3 provides a summary of the characteristics of travellers who unliked a travel-related organization compared to travellers who have not terminated such a relationship.

4.2 Reasons for Breaking Up

In open-ended questions, travellers were asked what motivated them to unlike a travel-related company or destination. The results are broken out by the type of organization that travellers have unliked: 86 travellers answered the open-ended question for a travel-related company and 62 travellers answered them for a destination. The reasons mentioned for unliking a travel-related company that were related to the company itself were a bad experience with a company's service, a lack of interest in purchasing from the company, or a change in promotional offers. The reasons for unliking a travel-related company that were related to the company's social media presence were either too high or too low frequency of posts or lack of information provided by the company's posts. The reasons mentioned for unliking a destination that were related to the destination were fear

of a destination's bad reputation spilling over to one's own reputation, a bad experience at the destination, and a lack of usefulness of the relationship with the destination. The reason mentioned for unliking a destination related to the destination's social media presence was high number of posting activity. More specific results are presented in the following paragraphs, organized by motivations for breaking up and grouping travel-related companies and destinations together under the same theme when appropriate.

I don't feel the same way about you anymore. A bad experience with a travel-related company was consistently mentioned for unliking. Travellers mentioned bad customer service and a company's failure to live up to customer expectations as reasons for unliking. Respondents also singled out the companies they had unliked by name, indicating deep disappointment with a company: "*I had a bad experience when renting a car at a local Enterprise location and wanted nothing further to do with that company ever*." For destinations, having a bad experience was an important reason for unliking. Here, bad experience spanned a wider range than for travel-related companies and travellers were more specific in giving their reasons. They mentioned bad experiences seemingly beyond the scope of a destination marketing organization, such as encounters with local people, insufficient infrastructure, lack of cleanliness, high costs and bad experiences with travel-related companies. Travellers appear to put more consideration into breaking up with a destination than breaking up with a travel-related company: "*It was somewhere that I had travelled to that I did not like—I would not dislike a place unless I have been there*."

You're going to make somebody really happy someday. Travellers mentioned a lack of interest in purchasing from a travel-related company or vacationing at a destination as motivations for unliking. They did not perceive the relationship with the organizations useful to them anymore and moved on, humanizing the relationship by using the wording one would for an unwanted friend or a partner: "*Moved on to other destinations*" or "*I was no longer interested*." They mentioned a lack of relevance of updates as reasons.

We're just at very different points in our lives right now. The reasons for unliking given by travellers were characterized by their temporality, leaving the door open for a rekindling of the relationship at a later stage. For travel-related companies, travellers mentioned promotions or contests as reasons for first liking a company, and then unliking it again after the contest or promotional period was over. The companies that were first liked and then unliked did not seem to be companies of which travellers were either customers or companies travellers would have liked without promotions: "*It wasn't an airline I used, I liked it for the promotion, then unliked it later*." It appears that contests did not foster a sustainable, long-term relationship between travel-related companies and travellers. For destinations, travellers mentioned concerns about political stability and safety as reasons for unliking. Some of these may only be temporary and able to be resolved, and travellers may decide to like a destination again at a future point, for example "*Warfare being active there, or highly probably (sic) to occure (sic) soon*."

My friends don't like you, so…bye. Some of the safety concerns mentioned by travellers for unliking a destination were related to a fear of a destination's bad reputation spilling over to one's own reputation over to their own image: "*The location had a bad reputation like Dachau*." In the same vein, travellers were motivated by other peoples' experiences—whether known to them personally or not—to unlike a travel-related company: "*Bad press*" or "*Cause of my friend's experience*." Travellers will break ties with organizations on social media sites that stand in the way of their favourable self-presentation.

I need my space. Travellers mentioned too high frequency of postings by travel-related companies as reasons for unliking them: "*They started filling up my newsfeed*." In the case of destinations, travellers less consistently mentioned high frequency of postings as reasons for unliking them. This finding may suggest that relationships travellers have with destinations may be more selectively chosen. They may be characterized by a deeper attachment and are less tenuous than those travellers have with travel-related companies.

You don't understand me. Travellers mentioned a lack of relevant information in travel-related companies' postings as another reason for unliking them, confirming a certain tenuousness that characterizes the relationship between traveller and company. It appears that destinations are—to their benefit in this regard—not seen as businesses wanting to sell a product, in contrast to travel-related companies. This may explain why travellers appear more inclined to end their relationship with a company than with a destination: "*If any company doesnt (sic) have much to say or is [a] hard sell all the time then i (sic) dont (sic) see the point in being with them […] they need to talk to us in other ways and create shared interests with us*."

5 Conclusions

5.1 Theoretical and Practical Implications

This paper provides a first look at travellers who unlike travel-related companies and destinations on facebook. The paper finds differences in demographics, psychographics, travel planning behaviour, travel behaviour, and internet use between travellers who have unliked travel-related organizations and those who have not done so. Respondents who are male, those aged 25–34, in the workforce, and with higher education levels are more likely to have unliked previously. Where travellers are from also makes a difference. In addition, their travel behaviour is different: Unlikers are more likely to be frequent and experienced travellers who are open to new experiences and places. They appear to cast a wider net during the travel planning stage, actively searching for information and being more involved with companies from which they might purchase as well as destinations to which they might travel.

The paper finds that there are different motivations for unliking destinations as opposed to travel-related companies. Travellers' online relationships with destinations seem to be characterized by a deeper level of emotional attachment, while travellers' relationship with travel-related companies seems to be more functional and tenuous. Social media presence and specific marketing activities do not seem to affect the relationship travellers have with destinations, but matter for relationships with travel-related companies. Travellers routinely break up with companies because of their online behaviour, that is the frequency of their posting activity or the absence of promotions or contests, while this is much less so the case for destinations. Travellers appear motivated to break up with a destination based on bad experiences and angst that a bad destination image may spill over to their own image, implying that destination reputation indeed matters (Marchiori and Cantoni 2012).

When drawing comparisons between unliking organizations and unfriending people, it appears that travellers humanize the relationships they have with travel-related organizations because it is on the same platform that provides them with relationships with people—which might blur the distinction between the two. The main difference between breaking up with people and organizations online appears to be that with companies, respondents are not worried about repercussions and being discreet. They do not seem concerned with making the end of their relationship a public statement. In a sense, unliking organizations may act as a performance review.

Travel-related organizations have yet to master all aspects of social media communication. When asked about their motivations for unliking travel-related organizations, respondents did not mention lack of responsiveness as a reason. Travellers who have unfriended a travel-related organization were more likely than others to have sent a private message to travel-related organizations on facebook. The fact that unresponsiveness was not once mentioned as a reason for breaking up suggests that communication with travel-related organizations appears to be satisfactory to consumers in a one-on-one setting, but not in a one-to-many social media setting. As stressed in previous studies (Yoo and Gretzel 2010; Gretzel and Fesenmaier 2012), since the latter is at the core of an organization's social media presence, it appears that travel-related organizations have yet to learn how to communicate in that setting.

Travel-related companies and destinations will have to learn how to successfully engage their customers on social media without relying on traditional sales approaches. They have to understand and embrace the consumer as a co-creator of value and a co-manager of conversations. Further, they have to understand the motivations behind travellers' decision to end their relationship with an organization. Specifically for travel-related companies, a large part of travellers' motivations for breaking up are related to a company's online social media behaviour. Travel marketers need to understand how they are losing customers, and need to implement a strategic social media marketing plan to prevent losing customers for

reasons related to the company's social media presence. A major challenge in this area is the lack of concrete evidence of which communication strategies are appropriate for what audience and what context.

5.2 Limitations and Future Research

Because of sample size restrictions, this paper only looked at the aggregate of unlikers of either travel-related companies or destinations. The results suggest that there may be differences in travellers who unlike destinations in comparison to other travel-related companies. This paper was not able to unearth those differences in a more detailed way, and future research is needed in order to capture any differences in the way travellers interact with different types of travel-related organizations. Further, the data come from a set of respondents from five different countries, and, because of the small number of travellers who unliked a travel-related organization which is not equally distributed across these countries, may not capture or may overstate differences and/or similarities. Cultural differences need to be explored in future research. Further, we only investigated unliking as the ultimate end to a relationship but future research also needs to look into those travellers who simply ignore or do not even remember relationships established with travel organizations. Another limitation is that travellers may have forgotten that they had previously unliked a travel-related organization. Finally, another question not currently answered is how selective travellers are in establishing relationships in the first place and whether this has an influence on their defriending behaviours.

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Measuring Emotions in Real Time: Implications for Tourism Design

Jeongmi (Jamie) Kim and Daniel R. Fesenmaier

Abstract This study introduces a new approach to assess travellers' emotions in natural settings, and discusses the implications of this approach within the context of designing tourism places. In particular, recent advancements in technology enable researchers to measure individual's electrodermal activity (EDA), a primary physiological measure of emotions, within a wide range of environments. This paper reports the results of a case study which tracked the emotions of two visitors to Philadelphia, USA over four days. The results indicate that the Philadelphia visitors exhibited a substantial variation in emotions depending upon the places visited, their activities, and the people they met; also, the two responded differently to the environment throughout the four days. It is concluded that the ability to measure travellers' emotions across settings and in real time can help to explain the relationship between physical and social environments and emotion, and in turn, provides an extremely useful tool for evaluating alternative strategies for designing and managing tourism places.

Keywords Tourism experience · Electrodermal activity (EDA) · Emotions · Real time analysis · Tourism design

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1 Introduction

Travellers' emotions are considered a key attribute of tourism experiences, satisfactions and intentions. Therefore, many tourism studies have been attempted to define the meaning of emotions and to measure them within touristic settings (Bigné and Andreu 2004; Hosany and Gilbert 2010; del Bosque and San Martin 2008; Wirtz et al. 2003). Despite the improvements in mobile technology and survey methodologies, much of the research in this area is still limited to self-report measurements focused on context-specific emotions which capture only small amounts of information rather that entire tourism experiences (Nawijn et al. 2013; Poh et al. 2011). As such, there are a number of validity problems in this research. Perhaps most important, the time gap between when the emotions are raised and when they are reported create problems wherein there is a "slippage" between what travellers truly experience emotions and what they describe (Cary 2004). Also as demonstrated in several studies, having a feeling is not same as being aware of it and affective response can easily occur in the absence of, or conscious awareness of, external stimuli (Winkielman and Berridge 2004; Ulrich et al. 1991). Indeed, these studies suggest that there are 'in-between' tourism experiences. Yet, most studies do not consider the dynamic interaction between the environmental factors and emotions across shifting boundaries. This is important in that emotions have been shown to affect traveller's sense of place and time such that one's pre-experienced emotion will alter later-experienced emotions, and this interactional process continually (re) shapes one's tourism experience (Davidson and Milligan 2004).

In this paper we present an alternative approach to measuring travellers' emotions based upon their physiological responses to environmental stimuli. This approach uses new mobile physiological measurement technology which makes it possible to collect and quantify detailed data from travellers in real-time and real-world settings. This approach is based upon the argument that for every moment a traveller sees, listens, smells, tastes and touches 'objects' within the destination, emotions are produced (Winkielman and Berridge 2004). And importantly, an emerging body of literature argues that these physiological measurements can be much more reliable in assessing emotions than self-report methods (Picard 2010; Bagozzi et al. 1999). Following from this literature and recent research in tourism, we report the results of an exploratory case study which first measured the physiological (i.e. EDA) responses of two travellers to a number of touristic places in a large metropolitan city located in the northeast United States; these results were then analyzed and interpreted using matching self-report data obtained from the two informants following a narrative methodology. The findings of this study clearly describe the dynamics of tourists' emotions. Further, it is argued that this new approach represents a fundamental transformation in methodologies that can be used for developing new strategies in the design and management of tourism places.

2 Measuring Emotions

Although there is no absolute definition, emotions are commonly understood to be effected by an evaluation of an experience in relation to goals, motives or concerns (Frijda 1988). One of the important characteristic of emotions is that they have affective, cognitive, physiological and behavioral outcomes (Brave and Nass 2002; Kleinginna and Kleinginna 1981). Thus, emotions are considered to be a complex set of interactions among subjective and objective factors, mediated by neural/hormonal systems which can: (a) give rise to affective experiences such as feelings of arousal, pleasure/displeasure; (b) generate cognitive processes such as emotionally relevant perceptual effects, appraisals, and labeling processes; (c) activate widespread physiological adjustments to the arousing conditions; and, (d) lead to behavior that is often, but not always, expressive, goal-directed, and adaptive (Kleinginna and Kleinginna 1981, p. 355).

Many environmental psychologists, marketing and tourism researchers have tried to explain how individual's emotions and perceptions are influenced by various environmental stimuli. According to this research, two major approaches to conceptualizing emotions can be distinguished: categorical and dimensional. The categorical approach argues that there exist a small number of emotions that are basic, hard-wired in our brain, they are recognized universally and that they can be classified into basic and discrete components (Ekman 1999). Secondary emotions such as appraisal including behavioral intention are the results of more complex thoughts and a blend of basic emotions (Izard 1977; Plutchik 2003). Proponents of the categorical perspective argue that basic emotions such as anger, fear, happiness and surprise are universal and either innate or developed in early childhood (Ekman 1999; Izard 1977; Plutchik 1991); this perspective has been used as the basis for various protocols including Plutchik's (1980) Emotion Profile Index, or Izard's (1977) Differential Emotion Scale. However, a number of researchers have claimed that in everyday interactions people exhibit non-basic, subtle and rather complex affective states wherein emotions can be regarded as compounds being expressed in a three dimensional construct including valence, arousal and dominance (Lang 1995; Mehrabian and Russell 1974). Indeed, Mehrabian and Russell (1974) found that environmental perceptions stimulate different sets of emotions, and these emotions influence individual's reactions to the environment either positively or negatively. Their dimensional perspective serves as the foundation for the verbal self-report measurement—PAD scale and some studies use only pleasure and arousal to explain the structure of emotions (Wirtz and Bateson 1999; Russell and Pratt 1980).

Table 1 briefly describes the common approaches used to measure emotion. As can be seen, the most popular method used to measure emotion in tourism research is the self-report method; however, there are a number of critical limitations in this approach to understanding travellers' emotions. Importantly, self-report measures

Table 1 Key approaches to measuring emotions

Measure	Response system	Modality	Advantages	Disadvantages
Self-report	Subjective experience	Diary; interview; questionnaire	Unobtrusive; straightforward and simple	Assuming that people are aware of and willing to report their emotions; subject to the respondent's bias; results of different studies might not be directly comparable
Neuro/physiological response	Peripheral and central physiology, affect modulated startle, fMRI, PET	Skin conductance, body responses: pulse rate, blood pressure	Can detect short-term changes; cannot be easily faked	Reliance on non-transparent, invasive sensors; can reduce people's mobility, causing distraction of emotional reactions; inability to map data to specific emotions; require expertise and special, equipment
Observation	Behaviour	Facial expressions, speech, gestures	Use of unobtrusive techniques for measuring emotion	Cannot perform context-dependent interpretation of sensory data; highly dependent on environmental conditions some responses can be faked

(Adapted from Mauss and Robinson 2009; Lopatovska and Arapakis 2011)

are limited by the respondent's ability to remember or explain their emotions (Whilhelm and Grossman 2010). Further, Urry (2009) argues that timing and individual's goal also moderate the relationship between cognitive reappraisal and self-reported emotions. Although some studies have examined travellers' emotions by asking the same questions at regular intervals (Graham 2008; Tussyadiah and Fesenmaier 2009), there is still a big time-lag between the time that the emotions were produced and the reported moment.

An alternative approach to measuring emotion is based upon neuro-physiological observation such as facial-expression, eye-tracking, functional magnetic resonance imaging and skin conductance. Physiological measurement has been used in consumer research as early as the 1920s to measure advertising response (Bagozzi et al. 1999). This approach to measuring emotions complement self-report methods in that they can provide systematic and moment-to-moment information describing people's reactions to stimuli (Bagozzi 1991; Sørensen 2008; Wilhelm and Grossman 2010). However, since this approach requires special equipment that is not mobile, most studies have been conducted within laboratory settings (Henriques et al. 2013). This constrained environment can pose significant challenges for tourism researchers because it hinders the capture of the continuous movement and dynamic interaction between emotions, places and people in a natural environment (Davidson and Milligan 2004).

Recently, however, new technological tools have emerged to address these methodological concerns (Wilhelm and Grossman 2010). In particular, wearable and mobile physiological sensors are available that enable researchers to obtain people's physiological responses to a variety of emotional, cognitive, and physical experiences for long periods of time and without interrupting the experience (Strauss et al. 2005). Recent studies have demonstrated that the ambulatory measurement can guide provide essential aspects for understanding emotions in real-time and real-world setting. Healey and Picard (2005), for example, monitored driver's physiological responses during real-world driving tasks to examine relative stress levels; Alajmi et al. (2013) used physiological measurement to capture shopper's emotional responses in shopping mall environment. Further, Hogertz (2010) explored the link between the urban environment and pedestrian's emotional outcomes and tried to map these responses in real time.

3 Research Approach

The main goal of this study is to describe a real time approach to track the emotions of travellers in natural settings. In particular, an exploratory case study was used to examine the relationship between environmental stimuli and emotions implementing Mehrabian and Russell's the PAD model within the context of new mobile physiological sensors. Based on the PAD model, the outcome of EDA and

self report data was used to map traveller's emotions onto dimensional values of arousal and pleasance, respectively. For this study, the Affective Q-sensor was used to measure EDA where it is argued that when one becomes mentally, emotionally, or physically aroused a response is triggered in one's skin; this response is described as electrodermal activity and can be used as an indicator of one's level of excitement or relaxation (Strauss et al. 2005). It is a wrist worn, wireless sensor (two electrodes are placed on the ventral side of the arm) that measures EDA for 24 h with a sampling frequency of at 2, 4, 8, 16 and 32 Hz. It has been shown to produce stable and comparable results across a range of environments and location.

In this study, two informants who are 23 year-old female international graduate students were asked to spend four days touring (e.g., approximately two to three hours per day) in Philadelphia. The sampling frequency for all signals was fixed at 16 Hz. Given the exploratory nature of the study, we intentionally selected some of the most popular tours and attractions (e.g., City tour bus ride, Mural mile tour) in the city and the participants followed fixed travel itineraries. Also, the participants were given travel route maps for each trips and asked carry with them and were instructed to press the activation button of the Q-sensor when they had arrived at the place or event; the EDA data were then collected 16 times each second and time-stamped during the visit. Also, the participants were asked take photos and videos using their own SMART phone, and to wrote a travel diary about the most and least interesting events and reasons for each day. Finally, we conducted follow-up interviews of the informants to identify and understand the experiences over the four day period.

A brief explanation of how the automatic body reactions work in relation to emotions is needed. The human peripheral nervous system is divided into somatic and autonomic systems (ANS). While the somatic nervous system is responsible for movement and conscious reception from external stimuli, the ANS regulates unconscious body functions such as digestion and heartbeat. Also changes in EDA and skin conductance (SC) are linked to the level of sweat in the eccrine sweat glands which are, in turn, related to activity in the sympathetic branch of the ANS (Sørensen 2008). In other words, changes in SC are closely related to activity of the sympathetic part of the autonomic nervous system, and activity of the sympathetic branch is associated with emotion, cognition and attention (Critchley 2005). Thus, researchers have taken EDA measurements as a good indicator of one aspect of emotion such as attention, stress, anxiety, workload, pain, and arousal (Picard 2010; Wilhelm and Grossman 2010). There are limitations to this approach, however, in that it can only measure level of the arousal, not the qualitative aspects of emotion such as valence (e.g., positive or negative, approach/avoidance) or types of emotion (e.g., fear vs. anger vs. joy vs. disgust, etc.) (Finger and Murphy 2010). Therefore, to determine what cause which types of emotion, additional qualitative approaches such as observation, interviews and self-report survey are necessary.

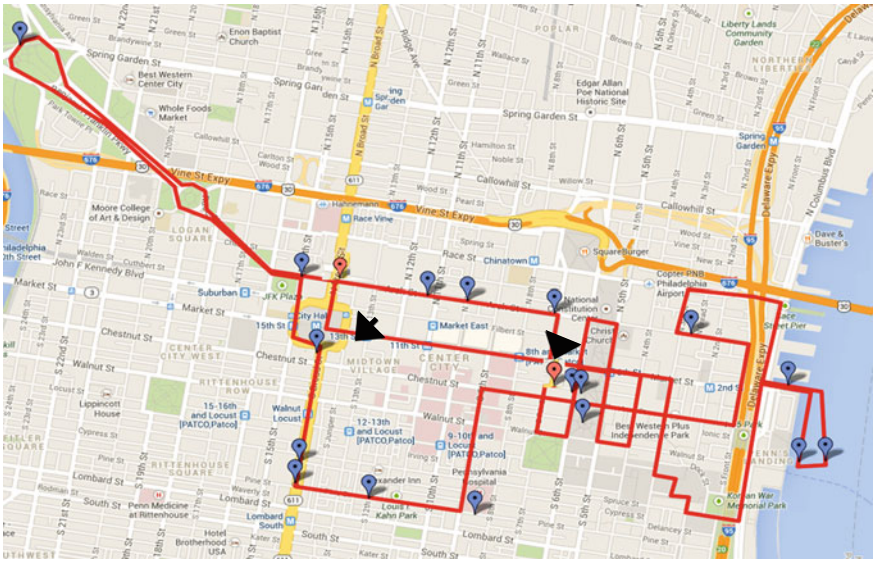

Fig. 1 Tour during day 1

4 Results of Case Study

Each informant spent a total of just over 6½ hours and visited/participated in 56 different activities/settings during this time, generating roughly 395,800 observations. The first step in the analysis focused on eliminating measurement errors caused by electrical noise, pressure and motion artefacts using MATLAB. The EDA values were then matched across participants and the different activities/settings based upon the time stamp. The skin conductance level and the ''peaks'' (which describes the rapid changes in emotions) were then compared across activities/settings and informants. Also in order to observe general level of arousal, the mean and standard deviation were calculated with SPSS 19.0. Figures 2, 3, 4 and 6 illustrate the results of these analyses for both participants throughout their visit to Philadelphia and the results are discussed below.

4.1 Day 1: Sightseeing Tour

During the first day, the two informants took a group bus tour, which covers the historical part of Philadelphia and includes a short river tour; the tour started 9:50 a.m. and finished at 11:35 a.m. Figure 1 shows their movement during the trip. Overall, the mean EDA value for Cathy was 0.38 (SD = 0.28) and the mean

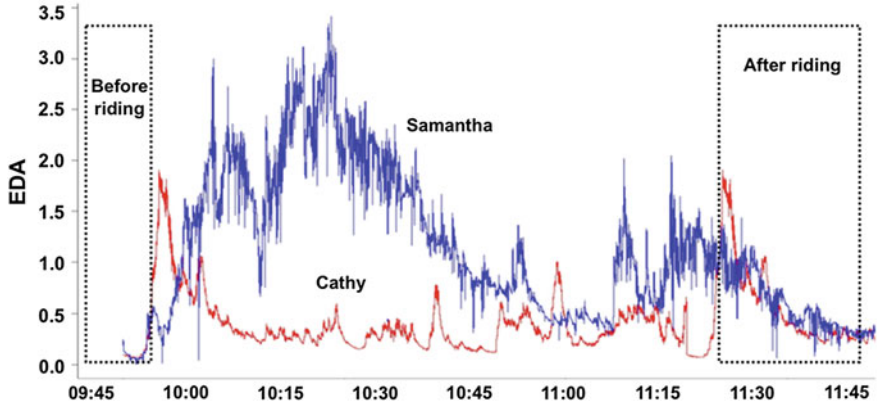

Fig. 2 Day 1 EDA level

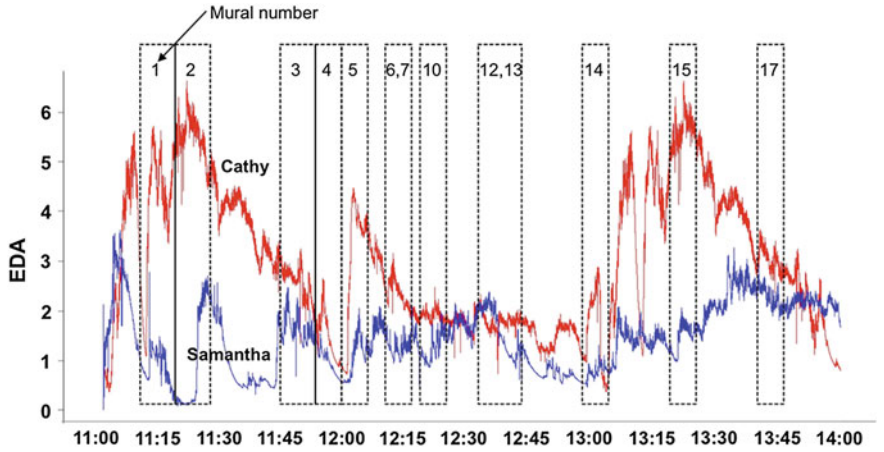

Fig. 3 Day 2 EDA Level

value for Samantha was 0.90 (SD = 0.67). Figure 2 presents the emotional response of the two informants throughout the tour. As can be seen, the skin conductance responses (SCRs) levels gradually decreased to a plateau during the initial relaxation period to establish a baseline. Also, their SCRs increased rapidly as they started the tour. However, only Samantha's SCR level showed a steep rise while Cathy's SCR level decreased when they were visiting China town. Samantha shows higher levels of EDAs than Cathy; however, both informants self-report diary showed high degree of satisfaction levels of the tour.

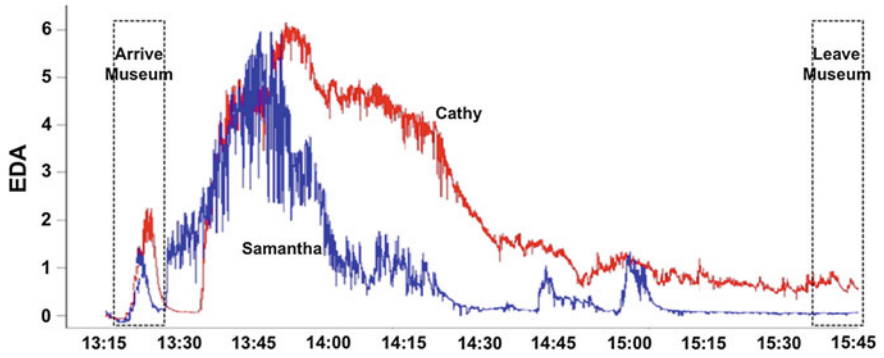

Fig. 4 Day 3 EDA level

During the follow-up interview, Cathy described her experience at the bus:

> The Duck [tour bus] was so cute. When I saw it [the tour bus], I was so exciting. It's my first time to take city tour bus. But later…it was boring. [Because] I was sitting on the inside …so I could not see the outside very well.

Samantha's said she had enjoyed the tour bus riding because she could see, hear and touch things around her:

> I didn't think I would enjoy The Duck [tour bus] this much. I mean, usually I don't like to go group tour. However, it was fun.

From these results, the emotional experiences as reflected in the interviews are consistent with physiological reactions recorded by measurement of electrodermal activity and indicated by SCR

4.2 Day 2: Mural Tour

The two informants were asked to participate in a self-guided walking tour of 13 murals located throughout Philadelphia for the second day (see Fig. 3). Specifically during phase of the visit, Samantha was asked to listen to the audio guide tour; a Mural Arts Program Guide provides a Mural tour map and the MP3 audio guide file (http://muralarts.org/tour/mural-mile-walking-tour-). They started the tour at 11:15 a.m. and finished at 1:50 p.m. The mean EDA value for Cathy was 2.72 (SD = 1.35) and the mean EDA value of Samantha was 1.70 (SD = 1.03). The pattern, peak point, and levels of EDA for the two informants differ significantly. Cathy (shown in red) shows higher levels of EDA and has more peak points than Samantha (blue). However, it is difficult to identify the specific reasons for this increased arousal.

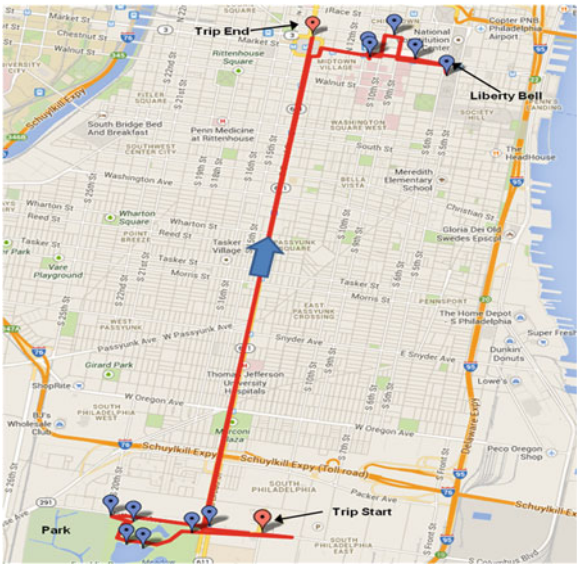

Fig. 5 Tour during day 4

Their self-report data, however, provide some clues in that Cathy described the actions of mural finding somehow "caused" her to feel even more excited toward her experiences; she wrote:

> Every time when I found a new mural [dotted line boxes in the graph], I was so surprised. [Because] I felt like a Sherlock Homes [detective]. So all along the street there are lots of building, shops and people…and they [mural] are hidden. However, once I found out, it looks like huge museum…I mean outdoor gallery.

Interestingly, Samantha's story contains the importance of weather, social interaction on emotions:

> Honestly, I'm not big fan of art. I like music but not painting. And these murals are scattered around Center City. I think it'll be better if all the murals are put together… We spent most of the time searching for the mural… you know was hot…. [During tour] I tried to listen [audio guide], so I could not talk to Cathy or other people once we found out the mural. Also Listening [English] is not easy.

Together with the interviews, the EDA data describe spatiotemporal experiences of two visitors to Philadelphia and demonstrates that their experiences were mediated by both internal factors such as motive and preference, and external factors such as weather, duration and the audio guided tour.

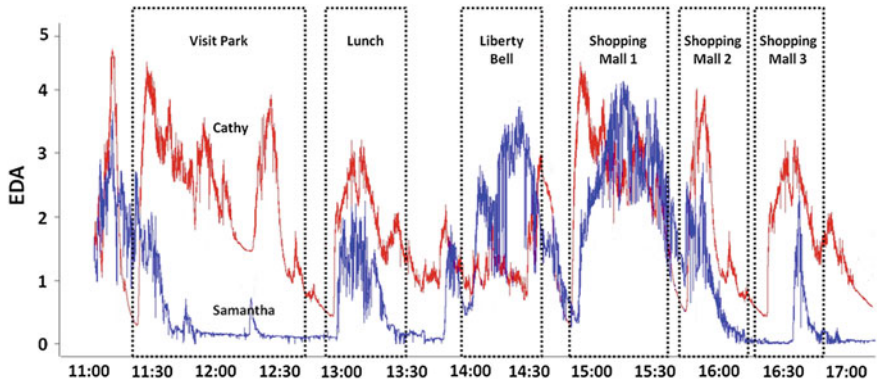

Fig. 6 Day 4 EDA level

4.3 Day 3: Museum Tour

On the third day, the two informants toured galleries within the Philadelphia Museum of Art. The tour started from 1:23 p.m. and ended 3:25 p.m. Mean and standard deviation of the EDA values for Cathy and Samantha are 1.44 (SD = 1.42) and 1.09 (SD = 1.36), respectively. Compared to Figs. 2, 3 and 6, the arousal level for both participants display less peak point and more monotonous patterns; both participants produced a large SCR after entering museum, but after that their responses to the along the museum tour are continually decreasing. From this data, it was concluded that the museum tour was a much less intense emotional experience for both informants.

4.4 Day 4: South Philly, Liberty Bell and Center City Tour

For the last day, they were asked to visit main touristic spots within the city including South Philly but explored the areas by themselves (see Fig. 5). The day started from South Philly at 10:27 a.m. and ended at Center City at 4:49 p.m. The mean EDA level for Cathy was 1.82 (SD = 0.97) and for Samantha the mean EDA level 0.95 (SD = 1.08). As illustrated in Fig. 5, the two EDA levels, patterns and number of peak points of the subjects are very different. Specifically, Cathy's EDA level was higher than Samantha when they visited the park, but during the lunch time Samantha's EDA increased dramatically. When they visited the Liberty Bell, Samantha's EDA level shows a dramatic increasing and both participants' EDA levels show similar patterns of arousal when shopping. On the self-report data, Cathy described the park they visited as the most interesting part of Day 4

while Samantha picked the Liberty Bell. In the follow-up interviews, the two were asked to discuss their preferences and previous experience with these two places. Cathy's experiences helped her recall special memories which are now somehow associated with the park:

> When I was kid, my family always went to the Park. This park is very similar to the park in my hometown….It reminded my family…As you know, we don't have the park here [in Philadelphia].

Samantha also described her experience about the park and the Liberty Bell:

> I like the park only there is something to do. [On Day 4] We went to the park because Cathy really wanted to go there. I couldn't say no. [Because] she also went to the Liberty Bell with me…She said it was her 3rd time to go there, but I've never been there.

5 Implications

Measuring travellers' emotions in real time and within natural touristic environments represent a significant methodological advance for the design and management of tourism places. In this paper we describe the emotional responses of two visitors to a number of Philadelphia attractions based upon EDA data. Importantly, these results describe how their emotions change dramatically throughout the day and when visiting attractions of differing interest and experience. These results can be interpreted from a number of different lenses. First, the results clearly demonstrate that it is now possible to capture travellers' emotional responses to environmental stimuli which, in turn, enables us to better understand how they perceive and respond to different settings. Further, this new approach enables us to understand how individual characteristics such as age, gender, culture, past experiences and personal preferences can moderate these responses (Bagozzi et al. 1999). Importantly, the results support the work of Zack and Tversky (2001) whereby this data can used to identify and understand discrete 'events' within the overall experience which, in turn, enable us to better understand how people deconstruct or represent a certain time interval (i.e., a day, week or month) as a series of 'acts' or 'scenes.' Finally, the results of this study suggest that by looking at the 'values' associated with these sequences of the experiences, we can understand what creates a meaningful experience. Also we need to understand how the emotions linked to these choices shape the overall experience because individuals make a series of choices within destination (Pearce and Moscardo 1984).

This new approach enables researchers to monitor travellers' emotions in real-time and in real-world settings. However, EDA alone cannot explain whether positive (e.g., excitement, joy) or negative (e.g., frustration, fear) event triggers

arousal; as such, additional data is needed to identify various aspects related to valence and environment including data obtained GPS, photos, videos, and other sensory data are needed to provide essential information regarding how and why emotions are created (Van der Spek et al. 2009). Thus, while not all questions can be addressed using EDA data, it is easy to predict that this approach to measuring emotion will provide a foundation for substantial development of new tools that will support the emerging field of tourism design.

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Part IV
Social Network and Interaction

Exploring the Role of Facebook in Re-Shaping Backpacker's Social Interactions

Edward Alexander Berger and Cody Morris Paris

Abstract The recent Facebook launch of Timeline, Social Graph Search, and the increased use of the mobile Facebook apps has resulted in some important implications for the use of Facebook by backpackers. The purpose of this paper is to (re) explore how Facebook has impacted social relationships between backpackers and their personal, professional, and 'fellow traveller' networks, particularly in-light of these recent changes to Facebook and the increased reduction of anonymity while travelling. An exploratory survey was administered to 216 backpackers through social media. Descriptive analysis was conducted to explore the perceived social risks and benefits of Facebook in the context of the backpacking experience.

Keywords Social media · Independent travel · Mobility · Social networks · Social capital

1 Introduction

The backpacker community has been an important segment of the tourism and hospitality industry, which has become increasingly mainstream (O'Reilly 2006) and visible across the travel and tourism landscape. Many recent studies on backpackers have been focused on exploring the relationship of this segments of tourists and their adoption, use, and relationship with advances in information,

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communication, and mobile technologies (Paris 2010, 2012; Germann Molz and Paris 2013). Several of these studies have noted that the adoption of technologies by backpackers have resulted in a 'virtualization of the backpacker culture' and allowed for the maintenance and sustainability of social relationships beyond the fleeting social interactions that occur while travelling.

In September 2011 Facebook radically re-designed the site, seeking to leverage the wealth of historical information it had gathered from users. The launch of 'Timeline', gave users complete and easy chronological access to a user's profile as it existed on a specific date (Facebook Inc. 2013). This historical access led to numerous issues as data that users thought was lost, deleted or inaccessible suddenly became readily viewable. For early adopters of Facebook, who had joined while at university, the sudden availability of this information was quite troublesome as many are now living quite different lives than they did in 2005. The second development, Facebook Open Graph Search, was launched in January 2013, and is a comprehensive natural language search algorithm. It draws upon the extensive information aggregated through the Timeline feature, a user's Likes, and other activities on the site to generate advanced search results. It also allows for previously impossible searches such as, "Women from Sydney Australia named Jane studying at Copenhagen Business School" which filters by gender, city and country of origin, first name including variations, and current place of study (Facebook Inc. 2013). This makes finding and potentially adding acquaintances significantly easier. It also has major implications for privacy. From a backpacker perspective, this makes connecting with fellow travellers you have met while travelling much easier so long as you have several basic pieces of information. At the same time, however, it also makes staying anonymous even more challenging.

The increased use of mobile devices to access Facebook is another development particularly pertinent to the backpacker segment. It is now easier than ever, and becoming increasingly common practice, to be able to add a contact on the spot through mobile devices using cellular or Wi-Fi internet connections. A noteworthy departure from previous exchanges several years ago which still required individuals to have access to bulky and less well-connected devices such as laptops and desktops with internet connections in order to connect or research each other via Facebook. When considered in parallel to Facebook's new Open Graph Search functionality (Facebook Inc. 2013) it seems likely that we will continue to experience greater blurring of the boundaries between digital and face-to-face communication and interaction. In short, we are increasingly moving towards an environment where electronic communication is always present even in the case of backpackers who were previously partially defined by their reduced access to these technologies (Bowe 2010; O'Regan 2008; Steinfield et al. 2009). The purpose of this paper is to (re) explore how Facebook has impacted social relationships between backpackers and their personal, professional, and 'fellow traveller' networks, particularly in-light of recent changes to Facebook and the increased reduction of anonymity while travelling.

2 Literature Review

Since the 1990s our cultural definition of community has been radically re-crafted and expanded. This has been driven by the widespread adoption of electronic media and the internet. Tools such as instant messaging, discussion boards, mobile phones, and our dependency on email (Mascheroni 2007; Tufecki 2008; Urry 2000) have broken down geo-spatial boundaries and greatly expanded our ability to maintain community over large distances and long periods. While these shifts and changes in mobilities have been important across all walks of life, they have been particularly significant for the backpacker community, which has been able to build upon these technologies to better maintain and virtualize their in-person social networks. These, in turn, have created non-geographically limited spaces in which sociality can occur through a blended combination of, "face-to-face interaction and mediated communication, co-presence, and virtual proximity, corporeal travel and virtual mobilities" (Mascheroni 2007, p. 527). These shifts have brought with them changes in the way backpackers relate to information, manage their social identity, and view the strength of their relationships.

2.1 Theories Explaining Online Identity and Social Behaviour

To further explore the impact of Facebook on backpacker's social relationships and their behaviour, we draw upon the Proteus Effect, a theory proposed by Yee and Bailenson (2009) as an adaptation of, Reicher et al. (1995) Social Identity Model of De-Individuation Effects or SIDE theory which can be used to analyze social boundaries and the formation of group norms in computer-mediated communication. The Proteus Effect differentiates itself from SIDE theory in part because unlike SIDE which focuses on group behaviours and norms, the Proteus Effect looks at the lasting effect of behaviour changes, including periods where the individual is no longer active within a group. This applies to a backpacker who continues to travel but is no longer physically co-present with peers or travellers met on the road.

The Proteus Effect is essentially an extension of Bem's self-perception theory (1972). The Proteus Effect expands upon the idea that internalization occurs when the subjects evaluate themselves from a third-person perspective. For backpackers this likely occurs while constructing their Facebook page and identity over time through the analysis and selection of interests, photos, videos and even custom friends lists. The Proteus Effect also expands upon individual identity as it may relate to expected versus socially-enforced behaviour and instances where these can be complimentary or alternately divergent (Yee and Bailenson 2009). This offers invaluable insight into how Facebook profiles, a digital avatar, can have a very significant real world behavioural impact and change a user's core identity.

Previous social-perception theory research highlighted the potential for changes in perception to translate into behavioural change (Yee et al. 2011; Valins 1966; Johnson and Downing 1979; Frank and Gilovich 1988). More recently researchers have sought to re-produce these studies in an online context. Findings by Pena et al. (2009) and Yee et al. (2011) both suggest that these behaviours are not limited to face-to-face interactions, and cross over to online identity. This supports that perceived opportunities and threats to backpacker's social relationships through Facebook, a digital platform, will translate into non-digital behavioural modification and vice versa.

This paper focuses on Facebook as it is an extremely rich and multi-layered resource and could impact backpacker behaviour through changes in individual's front stage management (Goffman 1959) behaviours. The advent and widespread availability of Facebook, e-mail, instant messaging, voice/video chat, international text messages, and the ease of movement is unparalleled (Mascheroni 2007; Tufecki 2008; Urry 2000). As a truly global community, backpackers have seen the environment they socialize within change significantly. With these changes have come shifts in the amount of time and energy needed to maintain the new opportunities and threats to their social capital which stem from increased interconnectivity.

Before the advent of Facebook and social networking platforms, what existed was an embrace-the-moment philosophy among backpackers. Backpacking provided an opportunity to make rich friendships, but these friendships were the embodiment of weak ties and assumed to be memorable but short-lived. In a sense, these interactions mirrored the places being explored. They were deeply enjoyed and lasted as long as the visit to a location, but then were often kept purely as a memory after the individual moved on to the next destination and group of acquaintances. While this discouraged maintenance of long-term friendships, it also encouraged a sense of anonymity and openness among backpackers. Understood through Goffman's (1959) conceptualization, this openness resulted in very different portrayals of individual's front stage selves, and an increased willingness to reveal elements of their back stage selves to semi-strangers. The sentiment often embodied a philosophy of, "I'll never see or talk to these people again so what do I have to lose?" A phrase still used within the backpacker community, but far less often as it is quickly becoming clear that the new answer is—"Quite a bit." In the words of Bennett and Regan the days of anonymity are fading and movement is no longer, "a means of evading surveillance but has become the subject of surveillance" (Bennett and Regan 2004, p. 453; Germann Molz 2006).

2.2 Facebook and Backpacker Social Interactions

Social networking sites mark a significant shift in the nature of backpacker social interactions. With a few casual pieces of information about someone gathered in passing, it is possible to use powerful search features to identify their online profile

(Facebook Inc. 2013). This has major ramifications for individual's anonymity. The previously insurmountable task of staying in touch and keeping information up-to-date is made simple using an internet connection and a series of clicks (Germann Molz 2006). Once added to an individual's Facebook account, we opt into a constant co-sharing of life events, key data, and extended interaction which allow us to take a lax, or pro-active approach to outreach and engagement. In so doing, we also open up elements of our existing social network to others, as they in turn grant us access to a large cross section of their social community. These technologies are not just simple social tools, they have quickly become stand-alone sites for sociality (Germann Molz 2006, p. 377).This increased access provides a complex mixture of wonderful new opportunities—such as staying in touch with fellow travellers—and challenges—such as the collision between various social groups, conflicts between our various social identities, and a loss of anonymity. These can be understood through the lens of social facilitation, front stage management and the shifts that result within individual's ability to build and maintain social capital.

It should come as no surprise that users utilize Facebook predominantly to explore and follow their friends and friend's networks. The result of this surveillance leads to direct impacts on relationships and can either strengthen or weaken them depending on the information that is uncovered (Golder et al. 2006; Vitak 2008).This information can range from issues with authenticity and behaviour to aspects of political and religious principles which would otherwise remain unknown and can have a significant impact on a person's social capital. In line with Goffman's concept of a front stage, and the concept of social facilitation, Facebook users have shown an acute awareness of this and as a result work to assemble, craft, and present socially desirable profiles that combine actions, images, and information that enhances their social capital (Zhao et al. 2008). In line with predictions made by the Proteus Effect studies such as that done by Vitak (2008) have already begun to identify how Facebook is having a very real impact on face-to-face interactions and offline relationships. The survey noted that 13 % of users surveyed admitted that Facebook had damaged their relationships, an illustration of loss of social capital, due to information shared on Facebook. Of those 13 % more than half stated that Facebook has resulted in disagreements with friends and 18 % with family members reflecting damage to both bridging and bonding forms of social capital (Vitak 2008, p. 89).

As media have become richer, and Facebook a more pervasive and open network, this concept of surveillance has grown significantly. The technologies that enable such effective and flexible communication also provide complex opportunities for close and distant social relations to monitor our behaviour and interactions. In line with this, Mansson and Myers' (2011) review of literature noted that the majority of people's time on Facebook is centred on the maintenance of their existing network; not pro-active networking with outside groups which embodies what is expected based upon existing social facilitation research. This reflects the backpacker practice of adding individuals who were first met in person, or referred to them through an existing member of their social network. Browsing profiles,

photos, status updates, and keeping tabs on romantic interests were all primary aspects of user's regular activity. This type of surveillance has become so ingrained in our culture that verbiage such as 'facebooking' someone is a core part of our social vernacular (Vitak 2008, p. 41).

2.3 Managing Social Interactions and Privacy

The rise in importance of Facebook's privacy settings has served as one way of attempting to control the mixture of different networks that collide through Facebook. These are the embodiment of Goffman's (1959) concept of front region control and managed social capital (Ellision et al. 2007). They provide users tools that simultaneously allow for the controlled distribution of messages/updates and data through custom, user-selected, privacy levels, or more sweeping privacy settings that limit an individual's visibility. While these privacy controls do allow for more precise network management, the more complex the attempt at control, the more likely it is to fail.

Facebook's own evolving nature is one such threat. Both Facebook's transition from a closed university-based system initially to a public, global, and open system and its roll-out of the Timeline feature (Facebook Inc. 2013) serve as prime illustrations of where changes to the system can open users up to significant social ramifications. The social nature of Facebook is also another complicating factor, as it is impossible to control absolutely the chaotic elements introduced by an individual's Facebook friends. These individuals may post data, images, or other content that unintentionally breaches whatever security steps have been taken, in turn revealing compromising information about an individual's activities, past, location, or involvements. This raises the point that not only does Facebook provide us with the opportunity to stay in touch with weak ties embodied by the concept of bridging social capital, individuals we would otherwise likely lose contact with almost immediately, it also allows different individuals within our network the opportunity to discover and interact with each other. These social crossovers, when positive, provide significant increases to our social capital while strengthening our network's opinion and connection to us. The nature of these interactions and their impact on our social capital can vary drastically from group to group. Travel activities that may build social capital with one group—say college peers—such as involvement in drinking culture, or data about sexual exploits may at the same time severely damage our social capital with others such as family members or existing romantic partners.

Despite this need for a more careful approach to our activities, the backpacker and hostel community have shown an eagerness to take advantage of these fantastic benefits. Not only does Facebook provide an opportunity to build maintained social capital with individuals that would otherwise be lost to the depths of geography and time, it allows for the construction of an attractive profile which helps to showcase the larger group identity with its inherent social capital, as well

as that of the individual. This is done through the sharing of photos, stories, videos, and conversations accrued while travelling. It also opens up an entirely new level of access to media captured by other backpackers during shared experiences. Thus, the same individual that might inadvertently post an incriminating photo of a backpacker passed out in the hostel bathroom may alternately post photos of that individual reflecting in a museum, or bungee jumping over Victoria Falls. Despite these positives, there is the impending threat of crippling losses to social capital should aspects of the backpacker and hostel experience reach employers in inopportune or unintended ways. The highly social and experiential nature of backpacking can lead to the posting and discovery of unflattering activities. These may be depictions in the form of photos or other content of general drunken behaviour, cultural ineptitude or more extreme behaviours such as documented drug use or vandalism (Bellis et al. 2007; Cohen 1973; Paris and Teye 2010; Riley 1988).

Recent statistics suggest that at least 35 % of potential employers now do social media searches and that a third of those that do have found information which prevented the hiring of the candidate. The top two categories of content that blocked applicants were inappropriate photos/info and information tied to alcohol and drug use (PR Newswire 2012). It should be noted, however, that here too employers also stated that they evaluated the profiles for positives which were documented and in many cases helped the employee's application. Other research that has investigated the impact of Facebook on an individual's relationships and social capital suggests a wealth of career-related pitfalls associated with Facebook content. These range from accidently costing people their jobs, individuals being terminated, and severe disciplinary actions taken in response to content discovered on, and/or posted on Facebook. This data indicates that not only can Facebook data be an issue for potential employees, it can cause significant issues for existing ones as well (Wang et al. 2011). Given that backpacker demographic data suggests that many backpackers' trips are taken while on vacation or summer breaks, this highlights an area where activities on the road may pose long-term issues that carry forward after the trip ends should traveller's front stage management practices fall short or prove poorly thought out. Based on the review of literature this study has one main research question. How has Facebook, in light of recent changes, impacted the social interactions of backpackers?

3 Methods

Data was collected through an online survey administered through Surveymonkey.com. The questionnaire was developed based on academic literature (e.g. Germann Molz 2006; Mascheroni 2007; O'Regan 2008; O'Reilly 2006; Paris 2013; Paris and Teye 2010), the researchers' personal experience, a survey administered during a previous study by the authors (Berger and Paris 2013), and was pre-tested prior to being administered. The questionnaire included a mixture

of demographic questions and likert-type (1–5) scale question focused on the impacts of Facebook on backpacker identity, experience, and social interactions.

Surveys were distributed through convenience and online snowball sampling (Baltar and Brunet 2012) procedures over a 10 day period in the spring of 2013. Due to the highly mobile and geographically diverse nature of the backpacker community, the mixture of convenience and snowball sampling was selected in order to provide the greatest level of access and exposure possible with limited resources (Sills and Song 2002). Backpackers are a 'difficult to sample' group, and similar sampling methods have been used in previous backpacker studies (Paris 2013). A link to the survey was posted with a brief introduction specifying that the survey was specifically targeted at backpackers who were on Facebook. In total the survey and a short message were posted to twelve Facebook 'backpacker' groups (Paris 2013) which contained a total 28,277 members. The practice of "bumping" the posting back to the top of the group discussion threads was used to ensure maximum visibility. In addition to Facebook, the survey link was distributed through Twitter. This was done through the one of the researchers' accounts, which has 5,839 followers, most of which are tied to his involvement within the backpacker community as a travel writer. Through industry relationships both Hostelworld and Hostelbookers, the two largest backpacker hostel booking websites, both repeatedly sent out tweets with the survey link. The total reach of the three Twitter accounts was 50,748. Tweets also included the use of #hashtags to help access a wider audience. Overall response rate is difficult to determine as these figures are somewhat inflated as it is difficult to ascertain how many of the members occupied membership across multiple groups, or to know how many times the link was shared or re-shared by some respondents. A total of 212 useable surveys were collected. Based on the Facebook Group Members and Twitter followers, an imprecise response rate would be 0.2 %. Data was analysed using SPSS.

4 Results

The profile of respondents aligns with recent studies on backpackers. The survey revealed that the respondents were long-term Facebook users. Just over 36 % joined between 2004 and 2006 while the network was still mostly closed and limited to university students. The largest number of signups occurred in 2007, shortly after it was opened to a wider public audience with 34.7 % of individuals joining that year. Interestingly none of the respondents were new to Facebook, as none reported joining in 2012 or 2013. When prompted if travel played a role in people's decision to sign up for Facebook, 23 % indicated it had at least some influence. Two-thirds of respondents reported using Facebook at least several times a week while on the road suggesting that these individuals are staying highly connected to their online networks, which reflects the wider intersection between

Table 1 Sample profile

	Number (%)		Number (%)
Age (years)		Gender	
18–22	20 (9.3)	Male	64 (30.2)
23–27	99 (45.8)	Female	148 (69.8)
28–32	52 (24.1)		
33–37	20 (7.9)	Education	
37+	25 (11.6)	High School (up to year 12)	7 (3.2)
		Some University	19 (8.8)
		University (4 year)	111 (51.4)
		Graduate (advanced degree)	78 (36.1)

Table 2 Facebook question response means

	Mean	Std.
Facebook has made travel less anonymous	3.73	1.072
Facebook has made my hostel experience more social (photos, communication, events, etc.)	3.62	1.099
I worry about other travellers sharing my personal activities on Facebook	2.27	0.975
I feel more accountable for my actions while travelling due to Facebook	2.60	1.153
Facebook is essential for maintaining relationships with people I met while travelling	4.17	0.927
I have travel contacts whom I met in hostels that I keep in touch with without the use of Facebook	2.63	1.369
I regularly add other travellers on Facebook whom I just met	2.86	1.204
I have maintained friendships made while travelling which would not have been possible to retain without Facebook	4.15	1.015
I am more connected to my fellow travellers because of Facebook	4.11	0.947
I have used Facebook to monitor a family member while they travelled	3.47	1.325
I have created custom lists to keep my travel friends separate	2.02	1.244
I have used Facebook to monitor a romantic partner while they travelled	2.57	1.342
The knowledge that my behaviour can be documented on Facebook keeps me from doing things I would have otherwise done while travelling	1.98	0.954
People I've met in hostels and kept in contact with through Facebook improve my professional network	3.18	1.049
Experiences that I have posted on Facebook from my time hostel/backpacking have harmed my career	1.58	0.773

physical travel and communication technologies (Germann-Molz and Paris 2013) (Table 1).

In addition to allowing backpackers to be co-present with their virtual networks, findings illustrate that they are using Facebook to (re)connect with other travellers while 'on the road'. In addition to helping facilitate and sustain social interactions, the results also indicate that respondents agree that 'Facebook has made travel less anonymous' (Table 2). One-fourth or respondents indicated that they felt more accountable for their actions while travelling because of their use of Facebook,

however on average respondents did not agree. Additionally on average, respondents were not worried about other travellers sharing their personal activities on Facebook (Table 2). In the context of surveillance and understood through the potential costs associated with members of an individual's network constantly re-evaluating an individual based on their profile this is a valuable insight. Not only does Facebook appear to be a surveillance tool used for positive social capital building and maintenance, it also provides an enforcement platform where at least part of the community experienced increased need for better monitoring and control of their front stage personas. About ten percent of respondents reported that people they have met while travelling caused problems for existing relationships at least once. Despite existing data about the number of employers doing social media searches and the potentially detrimental impact it can have, less than two percent of respondents stated that things they had posted had harmed their career, and there was on average a strong disagreement with the statement that, "Experiences that I have posted on Facebook from my time backpacking have harmed my career" (Table 2).

This suggests that while the number of respondents who are aware of damage to their professional social capital occurring is quite low, that backpackers likely underestimate the threat their actions and the material posted to Facebook poses to their professional career prospects. In addition to being aware of the potential risks and surveilling behaviour of their social networks, the majority of respondents also indicated that they have used Facebook to monitor a family member while they travelled. This surveilling gaze, a concept explored in depth in previous studies (Germann Molz 2006; Germann Molz and Paris 2013), suggests that the awareness of the decreased anonymity of the travel experience has not necessarily translated into strategies for negotiating this intersection of social networks. Only 16 % of respondents indicated that they created custom lists to keep travel friends separate from their main social network. Additionally, on average most disagreed with the statement that the knowledge their behaviour can be documented on Facebook has kept them from doing what they would normally do (Table 2). One strategy that was employed was the selective addition of fellow travellers on Facebook.

The majority of respondents indicated that they 'added' new friends to Facebook within the first several days of meeting them (70.9 %), with nearly half of these new connections being added within the first 12 h of meeting someone. This suggests that the once fleeting and short-term relationships of backpackers on the road are temporally extended. However, respondents do not necessarily do this regularly (Table 2). This suggests that respondents employ the act of 'rejecting' new friend requests as a means of negotiating social distance from those that they do not want to continue relationships with (German-Molz and Paris 2013). The primary reasons for rejecting individuals appear to be based in lack of familiarity with the person (47.3 %), and/or a general dislike for the person (63.7 %). A limited number of individuals expressed concerns about damage to their social reputation, existing romantic relationships, safety, or future career prospects as reasons for rejecting new friend requests.

In spite of the potential social risks, most of the respondents reported some sort of experience-sharing Facebook behaviour with those that they met while travelling. For example, over 50 % of respondents indicated that they shared and accessed photos shared by fellow travellers. These behaviours allow for the reinforcement of social relationships initiated through short-term physical contact. The three most agreed upon statements in Table 2 suggest that Facebook is viewed as an essential tool for maintaining relationships and feeling more connected with fellow travellers, many of which would not have previously been sustained. The strengthening of these 'weak ties' through Facebook also impacts the ability to reconnect in person with fellow travellers. Somewhat surprisingly, more than 75 % of respondents indicated they had used Facebook to meet up again at least once. These findings further support the notion that there has been both a virtualization of the backpacker culture and a hybridization of the 'road' and virtual backpacker culture (Paris 2010). Beyond the personal social network, there was a high level of agreement by respondents that these relationships maintained through Facebook also benefit them professionally (Table 2). These findings can also been interpreted as reflecting an extension of the Proteus Effect, through which people's relationships are bridging the digital/non-digital divide.

5 Discussion and Conclusion

Facebook is playing an increasingly essential role in facilitating and maintaining travellers' social relationships. Despite some risk to backpacker's relationships with their personal networks and existing social infrastructure, the findings of this study suggest that the benefits of adding other travellers is seen as a positive opportunity to maintain lasting relationships that were difficult, if not impossible, without Facebook. These benefits were generally seen to outweigh the occasional awkward Facebook encounter, but also suggest that there is an increased need for individuals to carefully engage in front-stage management of their online identities. In addition to the potential benefits and risks to their personal relationships, the reduced anonymity of their travel experience due to Facebook has the potential to impact their current and future careers.

The review of literature suggested that Facebook's reduction in anonymity would have adverse effects on individual's more impulsive and spur of the moment social interactions, and that it would discourage them from doing things they might not otherwise do due to the awareness that they were being monitored by the rest of their network (Allport 1924; Bordens and Horowitz 2008). However, the findings suggest that even though there is an awareness of the potential risks, the self-reported impact on behaviour was minimal. While a sizeable number of respondents showed an awareness of Facebook's risk to their privacy and current social relationships, only a small subset reported experiencing negative ramifications with only slightly more viewing it as a threat significant enough to cause behavioural change. The literature also suggested that this reduction in anonymity

and the resulting increased level of connectivity would be viewed as a net positive social benefit (Mascheroni 2007; Germann Molz and Paris 2013). This increase was anticipated to greatly improve the maintenance and exchange of social capital between backpackers by strengthening their connections and extending their ties and ability to remain connected over large geographical distances and extended periods of time. The findings indicate that backpackers view Facebook as an extremely positive social enabler that allows them greater access to their network with the potential for significant opportunities for increased engagement through both synchronous and asynchronous social interactions. The findings also suggest that these opportunities to build and maintain social relationships also translate into high-value communication that leads to and facilitates, in a majority of cases, future in-person reunions.

The results of this study suggest that there is a drastically different backpacker landscape than existed a decade ago and one in which the virtualization and intersection of the virtual and physical backpacker experience has resulted in unparalleled interconnectivity between backpackers. This added interconnectivity greatly increases backpackers' social capital, but comes with some increases in the complexity of social interactions as backpackers are forced to pay increased attention to how they manage their front stage personas and craft their social identities.

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Analysing Ecotourists' Satisfaction in Socialisation and Knowledge Sharing Intentions via Social Media

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Abstract Socialisation and knowledge sharing are considered vital for ecotourists in their satisfaction of ecotourism experiences. This study examines satisfaction in socialisation leading to knowledge sharing activities for ecotourists using social media. The study uses the social exchange theory and the theory of reasoned action to examine the factors of cooperation and reputation that lead to satisfaction in socialisation via social media and intention to contribute knowledge. Based on the multiple regression analysis results, the study confirms that cooperation and reputation leads to ecotourists' satisfaction in socialisation via social media which in turn leads to intention of ecotourists to contribute knowledge.

Keywords Satisfaction · Socialisation · Knowledge sharing · Ecotourists · Social media

1 Introduction

Ecotourism is a fast developing tourist activity that emanates from the sustainable tourism development concept. Ecotourism can be defined as "travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as

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well as many existing cultural manifestations (both past and present) found in these areas" (Ceballos-Lascurain 1987, p. 14). Ecotourism has been developing at a rate of 20–34 % annually since the 1990s (Lu and Stepchenkova 2012; Sharpley 2006). This rate of development of ecotourism has made it in terms of consumption comparable to any form of mass tourism and is sometimes termed as 'green consumerism' (Sharpley 2006). Therefore, consumers of ecotourism or 'ecotourists' are an important facet of global tourism. Ecotourists can be defined as anyone travelling with the primary motivation of viewing, enjoying and experiencing nature in a relatively undisturbed and uncontaminated natural area and undertaking at least one ecotourism experience during their trips (Tao et al. 2004, p. 3). Ecotourists look for learning and knowledge seeking experiences as well as socialising experiences with peer ecotourists in an ecotour while mass tourists are almost entirely driven by recreational activities available (Chan and Baum 2007).

Therefore, ecotourists' satisfaction from an ecotourism experience is affected by the extent of social interactions they engage in while on an ecotour as well as learning and knowledge seeking opportunities. However, the degree and content of the knowledge gained by ecotourists have been observed to be inadequate and inaccurate, which in turn can negatively affect their ecotourism experiences. This creates the need for ecotourists to share knowledge among each other through social interactions in areas of ecotourism-related recreational experiences and ecological aspects (Harlow and Pomfret 2007; Lu and Stepchenkova 2012). Moreover, ecotourists engage in promoting awareness on sustainability among each other through social interactions (Wearing and Neil 2009). Such social interactions results in a social influence, personal development and self-image enhancement as it facilitates sharing ecotourism-related knowledge, recommending attractions and promoting sustainability (Galley and Clifton 2004; Harlow and Pomfret 2007). These social interactions take place in the form of word-of-mouth exchanges which has been found as one of the main media of interaction for ecotourists.

Social media that enables a two-way communication platform between individuals is increasingly playing a significant role in facilitating ecotourists in word-of-mouth exchanges in the form of socialisation that in turn can lead to knowledge sharing. However, the dynamic role of recent Internet technologies like social media in word-of-mouth exchanges has found very little, if ever any, mention in the existing literature on ecotourism. Social media websites can serve as a channel which can facilitate sharing of ecotourism-related knowledge among ecotourists. Social media therefore has the potential to address needs of ecotourists beyond the basic utilitarian/functional needs that are common in case of mass/general tourists. As evident from previous studies, mass/general tourists are facilitated by social media in the form of recommendations provided that affects trip planning and trip purchase decision-making as well as basic travel information sharing (Nusair et al. 2012). However, there are no studies on the role of social media in addressing ecotourists' needs of socialising and knowledge sharing. Therefore, this study posits that social media enable satisfaction through social interactions among

ecotourists that can eventually lead to knowledge sharing intention on ecological and ecotourism aspects.

This study focuses on examining factors leading to socialisation and knowledge sharing for ecotourists using social media. Moreover, as socialisation is a vital aspect of ecotourists' experience, the importance of this study lies on examining the potential of social media in enabling online socialisation to ecotourists. Finally, as knowledge sharing is also an important activity of ecotourists, this study will throw light on the ability of social media in enhancing such sharing as a result of socialisation.

2 Literature Review

2.1 Ecotourists: Socialisation and Knowledge Sharing

Socialising activities and knowledge sharing intentions have been found vital in their ecotourism experiences (Chan and Baum 2007; Lu and Stepchenkova 2012). The social bonds developed through social interactions and relationships have been found to have an impact on the satisfaction levels of ecotourists. The hedonic and interactive elements involved in the process of social interaction during nature-based thrill and recreational activities appear as factors leading to ecotourists satisfaction of ecotourism experiences (Chan and Baum 2007; Eubanks et al. 2004; Harlow and Pomfret 2007; Lu and Stepchenkova 2012). Ecotourists in bird-watching activities have been found to develop strong ties among them through social interactions in the form of sharing knowledge as well as fun and enjoyment (Eubanks et al. 2004). Socialisation opportunities have been found to enhance personal development and self-image enhancement for ecotourists through developing and sharing knowledge (Harlow and Pomfret 2007). Sharing knowledge is another vital aspect for ecotourists in terms of sharing knowledge on ecotourism attractions, nature-based recreational experiences and promoting awareness on sustainability issues (Harlow and Pomfret 2007; Wearing and Neil 2009).

2.2 Social Media

Social media is one of the most revolutionary extensions of the Internet technology that provides a platform for social interactions between individuals through collaboration and sharing of audio-visual and textual content (Lew 2007; O'Reilly 2006). According to Kaplan and Haenlein (2010, p. 61) social media is "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content". Social media is typified into social networking sites (Facebook, Twitter),

online forums and blogs, audio-visual and photo-sharing sites like YouTube and Flickr. It enables 'collective intelligence' where individuals build on each other's knowledge through the formation of 'participatory communities' (Klososky 2011).

In the context of tourism, social media has enabled co-production of travel-based content between tourists by means of voluntary sharing and exchange of knowledge in relation to their travel experiences and functional information (Callarisa et al. 2012). Social media has a profound influence on aspects like travel booking, destination selection and tourism destination marketing as 70 % of tourists rely on social media-based recommendations for their destination selection and travel intentions. Facebook and Trip Advisor have been the leading social media sites used by tourists as there were 900 million monthly travel-based users of Facebook and 69 million monthly users of Trip Advisor by March 2012 in relation to travel recommendations and destination selection (Santos 2012).

In the context of social media use in ecotourism and sustainable tourism, the use of social media from the suppliers' point of view has not been encouraging due lack of access to the Internet (Lu and Stepchenkova 2012; Gibson et al. 2003). Social media use as an effective medium for interaction has not been evident in ecotourism (Lu and Stepchenkova 2012). However, social media can play a significant role in facilitating ecotourists as it enables social interactions and knowledge sharing in a voluntary manner both considered vital in their ecotourism experiences. Ecotourists being relatively younger and more educated than general tourists, are found to be heavily Internet savvy and can therefore utilize social media for socialising and sharing knowledge (Lu and Stepchenkova 2012). Since the lack of quality knowledge and learning opportunities are the challenges faced by ecotourists, the 'collective knowledge' enabled by social media by means of mutual exchange of audio-visual, pictorial and textual content could provide an alternative means to ecotourists to fulfil their nature-seeking and pro-environmental objectives. Previous literature on ICT use in ecotourism has little or no focus on social media given the potential synergy that exists between the facilitating aspects of social media and ecotourists travel motivations of socialising and knowledge sharing. Lai and Shaffer (2005) as well as Donohoe and Needham (2006) focused on the use and adoption of Internet technologies in ecotourism and on the marketing capabilities offered by Internet based on ecotourism tenets and sustainability criteria. However, none of these studies even being relatively recent have focussed on social media use in eco-tourism given the fact that social media has been in use almost a decade now. A more recent study by Wearing and Neil (2009) mentions about special-interest magazines, direct mail and the Internet about the prospective types of media that can enable ecotourists with required knowledge but did not mention on the potentiality of social media as another tool for ecotourists to socialise and acquire knowledge. This comes as a surprise since the study recognizes "inadequate information service technologies" in posing difficulties to carry out well-informed marketing of ecotourism. Lu and Stepchenkova (2012) focused on the attributes that influence ecotourists in their satisfaction of their ecolodge stays based on content available on TripAdvisor

enabled by user-generated content (UGC). However, this study focussed on the content available in TripAdvisor, a social media site, to examine the satisfaction levels of tourists in their ecolodge experiences but not on the functional as well as socialising and knowledge sharing benefits ecotourists can derive through the use of social media.

Previous studies in the context of social media use in tourism have been in the areas of system quality, information search; observe others posts, comments and information sharing (Pulvirenti and Jung 2011). However, socialisation through social media, which has been a vital aspect for online travel communities, is less evident in the literature on social media use by tourists. This is manifested through voluntary actions of users in sharing experiences, information and recommendations with likeminded people resulting in collective knowledge and sense of belonging (Schmalleger and Carson 2008; Sreenivasan et al. 2012). The users of social media often share information and provide learning opportunities to other users acting as socialising agents (Wang et al. 2012). Since socialisation is one of the main motivations in ecotourists' ecotourism experiences, this study will look into user satisfaction aspects of socialisation via social media in the context of ecotourists as the satisfaction levels in socialisation (social interactions) is expected to significantly lead towards knowledge sharing. Moreover, previous studies looking into the factors that lead to tourists' interactions in social media have focussed on functional benefits, social benefits, psychological, socio-psychological as well as hedonic benefits (Chung and Buhalis 2008; Parra-Lopez et al. 2011; Xiang and Gretzel 2010). None of these studies has specifically looked into the aspects of tourists' socialisation (social interactions and exchanges) via social media and the degree of satisfaction they derive from it that ultimately leads to knowledge sharing.

2.3 Social Exchange Theory

Socialisation (social interactions) through social media is an intense process of interactions and mutual exchange of knowledge in the form of audio-visual, pictorial and textual content. As a result the satisfaction from such socialisation is imperative in enhanced sharing and exchange of knowledge. The potential of social media to initiate satisfaction in socialisation among ecotourists online other than offline expands the scope for ecotourists in building and sharing knowledge collectively and in a mutually beneficial way. Based on this premise, this study brings into the context the social exchange theory which has the ability to predict social interactions and exchanges between individuals in leading towards sustained relationships in turn resulting in more sharing of knowledge. Social exchange theory (SET) explains a process of exchange of social resources among individuals. It suggests that individuals receiving adequate social resources from others will have an obligation to contribute adequately to others in return resulting in the

sustaining of the social interactions and exchanges and establishment of long-term relationships (Cameron and Webster 2011; Homans 1958, p. 606). In the context of online social interactions, SET has been used to provide theoretical explanations for individual-to-individual interactions in terms of consumer-to-consumer (C2C) interactions (Abdul-Ghani et al. 2011). Since this study also makes an attempt to look from an individual–to-individual (ecotourist-to-ecotourist interactions) perspective, it will employ the SET as the main encompassing theory.

Social interactions between members of online communities like in social media for socialisation as well as exchange of knowledge are based on certain factors that emerge from the SET (Dwyer et al. 2007; Nambisan and Baron 2010). The SET suggests the factors of reciprocity, cooperation, altruism, trust, social norms, community identification and power vital in examining the intensity of social interactions. The factors of altruism, trust, social norms and community identification are often found in the context of individual–to-individual online social interaction in general terms. While this study recognises the importance of all these factors as it also involves individual–to-individual online social interaction, it focuses on the factors of cooperation and reputation only. This is because firstly cooperation refers to the belief of one individual to reciprocate voluntarily with other individuals who have contributed knowledge resulting in more contributions from the contributing individuals and therefore sustained socialisation (Geffen and Ridings 2002). The voluntary reciprocation in social interactions does not take place instantly as there are no set of laws or rewards that necessitates it unlike in economic exchanges. Therefore the cooperative motives existent in individuals lead towards such reciprocity resulting in mutually fulfilling interactions (Blau 1964; Geffen and Ridings 2002). This is clearly indicates that cooperation is a key factor in effective social interaction and exchange between individuals in the online context. Most previous studies using the SET in the context of online social interactions have considered reciprocity but did not consider cooperation in spite of its vitality as a pre-condition for reciprocal behaviour. As a result this study considers cooperation as a SET factor instead of reciprocity.

Based on the above discussion, this study proposes the following hypothesis:

Hypothesis 1 Cooperation among Ecotourists' will positively influence their satisfaction in socialisation through social media.

Secondly, reputation refers to enhancement of self-image by means of sharing valuable knowledge with others through online communication (Nambisan and Baron 2010). The rationale behind considering this SET factor is that ecotourists have also been found to experience self-image enhancement by recommending and sharing about ecotourism related knowledge with other ecotourists as a vital part of their socialisation process (Galley and Clifton 2004; Harlow and Pomfret 2007). Therefore the second hypothesis can be explained as:

Hypothesis 2 Ecotourists' personal reputation will positively influence their satisfaction in socialisation via social media.

2.4 Theory of Reasoned Action (TRA)

Satisfaction in socialisation is an attitudinal aspect and attitudinal aspects have been found to positively affect intentions (Fishbein and Ajzen 1975; Shiau and Luo 2012). In the context of this study, it is posited that satisfaction in socialisation via social media being an attitudinal aspect can positively influence ecotourists' intention to share knowledge via social media. As a result, this study brings in the Theory of Reasoned Action to examine this posited relationship.

As per Hsu and Lu (2004, p. 854) In TRA, "belief (an individual's subjective probability of the consequence of a particular behaviour) influences attitude (an individual's positive and negative feelings about a particular behaviour), which in turn shapes behavioural intention". Previous studies have used TRA in linking satisfaction as an attitude towards online interaction with intention to engage in online activities like knowledge sharing (Hsu and Lu 2004; Hsu and Lin 2008; Shiau and Luo 2012). Therefore, the second hypothesis can be explained as:

Hypothesis 3 Ecotourists satisfaction with socialisation via social media can positively influence their knowledge sharing intentions.

3 Methodology

3.1 Data Collection

With the help of a structured questionnaire, a field survey was conducted at 3 different nature-based attractions in and around Kuala Lumpur city in July, 2013. The city of Kuala Lumpur was chosen due to its proximity to some unique and diverse nature spots of Malaysia. Kuala Lumpur being the most important city of Malaysia as well as being a gateway to different destinations provides an easy opportunity to a large number of tourists to sample some of the finest nature spots of Malaysia. The three different nature spots where the data were collected were Forest Research Institute of Malaysia (FRIM), Dark Caves, and the Kuala Lumpur Bird Park (Bukit Burung). The respondents were approached at the entry points of all these nature spots. In total, 200 fully completed questionnaires were received from the survey. Through 3 screening questions, it was assured that the respondents were ecotourists and they all used social media sites for their ecotourism trips to Kuala Lumpur. The questionnaire included definitions of social media, examples of popular social media sites as well as definition of ecotourist for providing a clearer understanding to the respondents.

3.2 Measures

Respondents were asked to fill in the questionnaires based on their current trip to the nature spots in Kuala Lumpur. The independent factors of cooperation and reputation had 7set of items. The items for cooperation were adopted from Geffen and Ridings (2002) while the items for reputation were adopted from Chang and Chuang (2011), and Nambisan and Baron (2010), respectively. The measurement items for cooperation (1) Other ecotourists have the motive to voluntarily respond to my contribution of knowledge (2) I believe in voluntarily contributing knowledge to others on social media (3) Voluntary contribution of knowledge on social media between me and others leads to mutual advantages for all (4) I believe, other ecotourists will contribute useful knowledge back to me when necessary on social media (5) When I interact with others on social media, I find others expressing interest to interact (6) When I interact with others on social media, I find others expressing interest to share knowledge (7) I can depend on other members on social media for useful interactions. The measurement items for reputation were as follows: (1) Participating in interaction with other ecotourists on social media enhances my reputation (2) Participating in interaction with other ecotourists on social media earns me rewards (3) Contributing ecotourism-related knowledge on social media helps build my reputation (4) Providing pictorial and/or audio-visual content on ecotourism attractions on social media improves my reputation (5) Contributing ecotourism-related knowledge on social media can bring more prestige to me than those who do not (6) By having the opportunity to provide effective ecotourism-related knowledge on social media, I can strengthen my credibility in social media. (7) By having the opportunity to provide effective ecotourism-related knowledge on social media, I can strengthen my authority in social media.

The dependent constructs of satisfaction with socialisation via social media and knowledge sharing had 5 items and 6 items respectively. All these factors and constructs were measured on a 7-point scale ranging from “strongly disagree” (1) to “strongly agree” (7). The seven-point Likert scale has been used to provide the flexibility to the respondents to a wide range of opinion (Rattaray and Jones 2005). The questionnaire also had questions on socio-demographic aspects, social media use and ecotourism activities undertaken.

4 Results

4.1 Demographic Aspects

The sample had the following socio-demographic characteristics: 53 % of the respondents were males and 47 % were females. With regards to the age and educational qualifications, almost 90 % were in age-range of 25–44 and 95 % had

university qualifications. This confirms the view in most ecotourism literature that ecotourists are relatively younger and more educated than other tourists (Lu and Stepchenkova 2012). In terms of social media use, it appears that Facebook is the most popular and widely used social media sites.

4.2 Cooperation, Reputation and Satisfaction in Socialisation via Social Media

Multiple regression analysis was conducted to examine the relationship between the SET factors of cooperation and reputation with satisfaction for ecotourists in socialisation via Social Media. The summary of model gives us a R Square of 0.639 which implies cooperation and reputation accounts for 63.9 % of the variation in satisfaction for ecotourists in socialisation through social media. Durbin-Watson available from the summary of model was 1.898 which is close to 2, and therefore it clearly implies that the assumption has almost been met. The results of the ANOVA revealed an F-ratio of 174.552 which is highly significant ($p < 0.001$) implying that the model is significant in predicting the outcome.

Results as reflected in Table 1 reveal that the overall model was statistically significant (p-value ≤ 0.1). Moreover the values of variance inflation factor (VIF) of cooperation (VIF ≤ 1.908) and reputation (VIF ≤ 1.908) are under the cut-off threshold point of $\leq$10, reflecting degrees of low multicollinearity among the variables. Therefore, it confirms that multicollinearity is not a problem for this model. While holding other factors constant and one unit increase in cooperation ($\beta = 0.481$, ţ = 8.143, p-value = _0.01), satisfaction for ecotourists in socialisation through social media would increase by 0.535 units and similarly, one unit increase in reputation ($\beta = 0.388$, ţ = 6.559, p-value = _0.01) satisfaction for ecotourists in socialisation through social media would increase by 0.345 units.

Therefore, the regression suggests that there is a significant and positive relationship between cooperation (a new SET factor in the social media context), reputation (or self-image enhancement) and satisfaction in socialisation with social media for ecotourists. As a result Hypothesis 1 and Hypothesis 2 have been accepted. Moreover, the regression analysis results confirmed that no assumptions have been violated.

4.3 Satisfaction in Socialisation via Social Media and Intention to Share Ecotourism Knowledge

Multiple regression analysis was also conducted to examine the relationship between satisfaction in Socialisation via Social Media and intention to Share Ecotourism Knowledge. The summary of model reveals a R Square of 0.711 which

Table 1 Regression analysis (satisfaction for ecotourists in socialisation via social media)

Model	Unstandardized coefficients		Standardized coefficients	*t*	Sig	Collinearity tolerance	Statistics VIF
	B	Std. error	Beta				
1 (Constant)	0.793	0.255		3.107	0.002		
Cooperation	0.535	0.066	0.481	8.143	0.000	0.524	1.908
Reputation	0.345	0.053	0.388	6.559	0.000	0.524	7.908
Dependent variable: satisfaction for ecotourists in socialisation via social media							

implies Satisfaction in Socialisation via Social Media accounts for 71.1 % of the variation in intention to share knowledge. Durbin-Watson available from the summary of model was 1.948 which is close to 2, and therefore it clearly implies that the assumption has almost been met. The results of the ANOVA revealed an F-ratio of 488.280 which is highly significant ($p < 0.001$) implying that the model is significant in predicting the outcome.

Results reflected in Table 2, that the overall model was statistically significant (p-value ≤ 0.1). Moreover the values of variance inflation factor (VIF) of satisfaction for ecotourists in socialisation through Social Media (VIF ≤ 1.000) is under the cut-off threshold point of $\leq$10 reflecting degrees of low multicollinearity among the variables. Therefore, it confirms that multicollinearity is not a problem for this model. While holding other factors constant and one unit increase in satisfaction for ecotourists in socialisation through Social Media ($\beta = 0.843$, ţ = 22.097, p-value = _0.01), intention to share knowledge would increase by 0.870 units

Therefore the regression suggests that there is a significant and positive relationship between the satisfaction in socialisation with social media and intention to share knowledge. These results confirm Hypothesis 3. Moreover, it is also clearly evident from these results that online socialisation enabled by social media leads to knowledge sharing for ecotourists. Furthermore, the applicability of the TRA in examining the relationship between attitude (satisfaction) and intention (intention to share knowledge) has been confirmed as in previous studies of Hsu and Lu (2004), Hsu and Lin (2008), and Shiau and Luo (2012).

5 Discussion and Conclusion

From the findings, firstly it can be observed that ecotourists derive significant satisfaction from social media enabled socialisation which leads to sharing of knowledge among them. Therefore socialisation appears to be vital for ecotourists beyond the offline context, i.e. beyond socialisation that takes among ecotourists during ecotours (Harlow and Pomfret 2007). Such socialisation enhances opportunities for ecotourists to overcome the difficulties of obtaining sufficient

Table 2 Regression analysis (intention to share ecotourism knowledge)

Model	Unstandardized coefficients		Standardized coefficients	*t*	Sig	Collinearity tolerance	Statistics VIF
	B	Std. error	Beta				
1 (Constant)	0.817	0.212		3.848	0.000		
Cooperation	0.870	0.039	0.843	22.097	0.000	1.000	1.000
Dependent variable: intention to share knowledge							

knowledge that they often seek as a part of their ecotourism experiences. Social media socialisation enables ecotourists to make the rich collective knowledge that they have to circulate and transfer within them. The circulation of the collective knowledge through social media among ecotourists can potentially mitigate the obstacles they face in knowledge seeking arising from instances like nature guides providing inaccurate and insufficient knowledge during ecotours or poor interpretation facilities at natural areas that fail to provide effective knowledge and information on ecological aspects. This reflects the fact that the knowledge sharing is a positive activity which can be enhanced relatively much more in online platforms like social media than in the offline context (Wang and Noe 2010).

Theoretically speaking, previous studies have posited the belief that the social exchange theory (SET) can be potentially used in non-organisational (individual-to-individual) online interaction context (Abdul-Ghani et al. 2011) while most studies in the past have focussed on the use of SET in the organisational context (Nambisan and Baron 2010). This study therefore has been able to confirm that the social exchange theory (SET) can be applied in the non-organisational (individual-to-individual) online interaction context of social media use by ecotourists. Moreover, the positive relationship of cooperation as an SET factor in leading towards satisfaction in socialisation through social media revealed from the findings of this study appears as a significant contribution in the discourse of social exchange theory in social media context. Additionally, as found by previous studies this study has also confirmed the ability of the Theory of Reasoned Action (TRA) in examining the positive relationship between attitude (satisfaction for ecotourists in socialisation through social media) and intentions (knowledge sharing intentions) (Fishbein and Ajzen 1975; Shiau and Luo 2012).

DMOs and management authorities of ecotourism attractions can derive practical insights from the findings of this study in terms of having an understanding of the importance of encouraging more satisfactory social media enabled interaction between ecotourists that ultimately leads to enhanced knowledge sharing. Managements of DMOs and ecotourism attractions are also provided by this study with an insight on the impacts of cooperation (cooperative motives) and reputation (self-image enhancement) in maximising satisfaction in socialisation via social media for ecotourists. Moreover, this study has enabled a better understanding of social media as an useful tool in terms of knowledge sharing in areas of ecotourism destinations, ecological aspects and awareness on sustainability issues among ecotourists.

To conclude, this study has focussed on only 2 SET factors of cooperation and reputation. However, this study did not attempt to examine the implications of satisfaction of ecotourists in socialising with social media on their satisfaction with their actual ecotourism experiences. This aspect demands an investigation by future studies. Moreover, future studies can also look into perceptions of ecotourists about social media who are non-users in aspects of socialisation and knowledge-sharing. Finally, the role of other SET factors in the context of social media use as to how they affect socialisation via social media and knowledge sharing also deserves an analysis in the future.

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Opinion and Consensus Dynamics in Tourism Digital Ecosystems

Rodolfo Baggio and Giacomo Del Chiappa

Abstract A tourism destination is a social network with a group of interacting stakeholders jointly producing the experience that the travellers consume. The harmonisation and coordination of stakeholders' views and the development of a consensus-based strategy are essential elements for destination competitiveness and growth. Despite that, there is still scarce research aimed at analysing the mechanisms through which consensus can be achieved and how such a process can be assessed and monitored. This paper aims at contributing to fill this gap applying a spectral analysis to three destination networks with the objective of analysing the mechanisms through which information flows across the connections that link the different stakeholders and those that rule the establishment of a common opinion. Contributions to the body of knowledge and managerial implications are discussed and suggestions for further research are given.

Keywords Digital ecosystems · Tourism destinations · Opinion dynamics

1 Introduction

A tourism destination is a cluster of interrelated stakeholders embedded in a socio-economic milieu that strive to meet visitor needs and produce the experience that travellers consume (Baggio et al. 2010; Del Chiappa and Presenza 2013). As a consequence, successful tourism marketing requires all the components to work

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together. Specifically, contributions relating to tourism destination planning do stress the need for involving public and private players in order to reach a consensus so that the strategies of companies and institutions converge towards the same goals and worldviews (Burstein 1991; Pforr 2006). Achieving a consensus-based collaboration within the network is essential for destination competitiveness and growth (Beritelli 2011; Nordin and Svensson 2007) and allows exploiting several benefits. In particular, it allows to reduce the costs involved in solving conflicts among stakeholders, it may bring legitimacy to collective actions when stakeholders are involved in the decision-making processes, and, finally, it may enhance the coordination between policies and related activities (Bramwell and Sharman 1999).

Recent research argued that a tourism destination can be considered a digital business ecosystem (DBEs). In other words, a destination is a networked system of stakeholders delivering services to tourists, complemented by a technological infrastructure aimed at creating a digital environment which supports cooperation, knowledge sharing and open innovation (Baggio and Del Chiappa 2013a, b). In such a system two main components are taken into account: a *real* one, composed of the business stakeholders in a certain economic or industrial sector and its *virtual* complement formed by the technological equivalents of these stakeholders. The real part generates the virtual one, but, given the strong coupling between the two, all modifications, changes or perturbations originating in one of them rapidly propagate to the whole system. That said, it was argued that the relationships between the real and the virtual components are so tight that it will be difficult, if not impossible, to consider them separate any more (Baggio and Del Chiappa 2013a, b). In such a context ICTs, information systems and social media can be considered as important coordination mechanisms (Bregoli and Del Chiappa 2013) that allow information to flow more easily across the destination (Fyall 2011) and through the stakeholders facilitating processes such as consensus-based tourism planning (Micera et al. 2013). Broadly, it can be stated that the Web has become the medium that enhances the interaction and collaboration between stakeholders and the sharing of information and opinions among them, in an attempt to converge toward a common vision (Funilkul and Chutimaskul 2009; Micera et al. 2013). In other words, ICTs allow "more contextual data to be transmitted and opinions to be shared and discussed" (Breukel and Go 2009: 188).

Tourism literature has widely recognised that collaboration, harmonisation and coordination of stakeholders' views working within the destination are pivotal for an effective and competitive tourism development (Moscardo 2011; Del Chiappa and Bregoli 2012). However, there is still scarce research aimed at explaining the mechanisms through which consensus can be attained (Ryan 2002) assessed and measured. The present study was carried out to investigate how the network structure of a tourism destination can affect the process of consensus development among stakeholders. To do that, a spectral analysis of the network was conducted. The analysis was also used to reaffirm the tight integration between real and virtual components in a DBE. The cases examined are those of three Italian tourism destinations already object of a previous study (Baggio and Del Chiappa 2013a, b).

In this way we derive a very strong and documented argument in favour of the digital ecosystem approach to the study of tourism destinations.

The paper is organised as follows. Section 2 briefly reviews the issue of consensus-based strategies; Sect. 3 describes the methods and the cases used. Results of the analysis and discussion follow. The concluding remarks close the paper with a brief discussion of the main implications of the outcomes presented.

2 Consensus Based Strategy in Tourism Destinations

A substantial body of empirical and theoretical research has accumulated on the subject of strategic consensus, especially adopting a micro-level perspective (i.e. the one of a single firm, see e.g. Amason 1996). Consensus received several definitions. According to Priem (1990, p. 469), consensus can be defined as a "general agreement in the opinions held by all or most". Interestingly, Kellermans et al. (2005, p 721) defined it as simply "the shared understanding of strategic priorities among managers". The concept of strategic consensus has been discussed also in the tourism literature where it has been recognised explicitly to be an essential element for destination competitiveness and growth (Beritelli 2011). According to Jamal and Getz (1995, p. 200) "in the fragmented tourism domain, perceived interdependence and key stakeholder involvement are not adequate for achieving success; methods must be devised for finding common grounds for facilitating consensus and for implementing the collaboration's results (if required)". Prior works in the field of strategic management showed that temporal issues should be considered in strategic-consensus research (Wooldridge and Floyd 1989) and that the achievability and desirability of consensus is likely to vary over time (Markóczy 2001). Based on this idea, Kellermanns et al. (2005) argued, for example, that consensus might be highly desirable during the implementation of a strategy whereas the process of formulation might benefit from a lower level of consensus (which comes earlier in the decision-making process). Indeed, the lower level of consensus in the process of formulation could help to prevent premature closure and encourage the expression of diverse views and opinions, thus increasing the decision quality and improving organisational performance. Kellermanns et al. (2005) maintains that the construct of strategic consensus consists of the following dimensions: scope (who participates in the process of decision making), content (what decision makers agree about) and commitment (managers' involvement and willingness to collaborate in order to implement the decisions taken).

In the strategic management literature only a handful number of papers deal with the topic of measuring consensus. For example, Bowman (1991) measured it as an index of consistency, expressed as the average correlation between the organisational members' responses. Iaquinto and Fredrickson (1997) used multiple scenarios and ask respondents up to 43 questions for each scenario. Another approach consists of measuring consensus as a product of commitment to and

understanding of a specific strategy (Floyd and Wooldridge 1992), where understanding is measured as a forced-choice distribution by respondents against a set of strategic priorities. Another interesting approach assesses consensus comparing the managers' mental models or mental maps that can be used to represent how they do perceive the relationships among different organisational success factors (Markóczy 2001).

Among the variables that might influence knowledge sharing and consensus development, the literature in strategic management and organisational behaviour considered ICTs and leadership (Yang 2010). Following this strand of research it could be argued that an effective leader is able to play the role of facilitator aiming to foster social interactions and to emphasise group harmony and consensus, thus invigorating interpersonal relationship among stakeholders, minimising conflicts and involving them in the strategic planning.

Here we consider an important aspect of the issue, the one that considers the mechanisms through which information is passed along the connections that link the different stakeholders in a destination and those that rule the achieving of a common opinion, accepted by the majority of them. In this case we disregard the qualitative traits of the single actors and concentrate on the role played by the topology of the destination network in the unfolding of the processes. This is not a limitation because the structure of the substrate has been found in numerous recent studies to be by far the major (and in many cases the only) factor affecting the speed and the extent of the diffusion or the time for reaching a stable *consensus state* (Baggio and Cooper 2010; Castellano et al. 2009).

3 Materials and Methods

The ecosystems examined in this study are those of the Italian destinations of Elba, Gallura and Livigno. These are three well-known destinations. Elba is an island off the coast of Tuscany (central Italy), Gallura-Costa Smeralda is the northwestern region of Sardinia, and Livigno is a mountain district in northern Italy, close to the Swiss border. The destinations are quite typical of their sort. Elba and Gallura are marine areas, while Livigno is an Alpine zone. Each destination, for the purpose of this study, is considered bounded by the respective administrative borders. The size of the three destinations, in terms of tourism firms operating, is similar, about one thousand companies, as similar is their tourism intensity. They receive about half a million visitors per year, with a strong seasonality. The ecosystem networks considered have been described elsewhere (Baggio and Del Chiappa 2013a, b). For all the systems we consider the whole network and the two subnetworks formed by the real firms and the one made of their virtual representations (websites). The main characteristics are reported in Table 1.

For all destinations, the networks of core tourism stakeholders (accommodation, travel agencies, restaurants, associations, consortia etc.) were assembled from lists provided by the local tourism boards together with those formed by their

Table 1 Main characteristics of the destination networks

Destination	Type	Nodes	Edges	Density
Elba	Ecosystem	1,156	2,712	0.0041
	Real	713	1,636	0.0064
	Virtual	443	494	0.0050
Gallura	Ecosystem	3,712	9,718	0.0014
	Real	2,235	6,077	0.0024
	Virtual	1,477	2,165	0.0020
Livigno	Ecosystem	751	2,740	0.0097
	Real	468	1,388	0.0127
	Virtual	283	566	0.0142

websites. In these networks the links between the different actors were uncovered following the methods extensively described in Baggio et al. (2010). In short, connections due to commercial agreements, co-ownership, partnerships, membership in associations or consortia as uncovered by consulting publicly available sources (listings, management board compositions, catalogues of travel agencies, marketing leaflets and brochures, official corporate records, etc.). All data have been also validated via in-depth interviews with knowledgeable informants (directors of tourism boards, directors of associations, tourism consultants).

It is straightforward to think that there is a qualitative difference in the links between real and virtual elements of the network and that, when information diffusion is concerned, this translates into a difference in transmission speed. To render this difference a weighted version of the networks was prepared in which we arbitrarily assign value 1 to a link between two real nodes, 2 to a link between a real and a virtual node and 3 to a link between two virtual nodes.

Here we continue the preliminary analysis presented in Baggio and Del Chiappa (2013a, b) and discuss two topics: the structural integration of the real and virtual components and the diffusion and synchronisation of opinions. The methods used belong to the class of spectral methods. The rest of this section discusses briefly the methodological bases for this analysis.

3.1 Opinion Diffusion and Synchronisation

Spreading an opinion is a process that has been studied in innumerable ways. For what concerns our cases we can use an epidemiological modelling approach (Danon et al. 2011; López-Pintado 2008). Such models consider the individuals in a group (population) as susceptible (S) to an infection. They could then be infected (I) and finally recover (R) from infection when acquiring some form of immunity or simply become susceptible again. The infection can well represent the acceptance of an idea or a message. For what concerns information or opinions suitable models are those that consider the S and I. A first one (simple) is termed SI model.

It posits that susceptible individuals, when exposed to a piece of information accept it and become infected. They remain in this state until the end of the process. A second one, more elaborated, is the SIS model. Here individuals, once accepted what transmitted, have a probability to *forget*, which can mimic the case in which news become uninteresting, or information obsolete, or some other event induce a change in an opinion previously accepted. This model has a well-known threshold τ_C which depends on the (average) capacity of individuals to infect others. The infection process dies when the infectivity $\tau < \tau_C$. All these processes are obviously also depending on the number and the distribution of the relationships existing in the population.

Another proposal for understanding the spreading of opinions is to treat consensus as a peculiar form of synchronisation, a phenomenon that has been very well studied in different contexts by means of simple and effective models. The most popular is the one of Kuramoto (1984). Here the elements of a system are thought of as a collection of oscillators coupled to each other. Each oscillator has an intrinsic frequency and a characteristic phase that might be seen as representing the individual's opinion. Linkages between individuals are given a value, which constitutes a coupling between the oscillators. Here too it is shown that when the coupling K is greater than a critical coupling K_C, which depends on the system configuration and characteristics, the whole system synchronises and all elements oscillate with the same phase, that is: a general consensus is reached and opinions are aligned (Arenas et al. 2008; Pluchino et al. 2005).

3.2 Elementary Spectral Graph Theory

Spectral graph theory is a branch of algebraic graph theory that studies graph properties such as connectivity, centrality, and clustering by using the methods of matrix analysis. Moreover, spectral graph theory has proved quite effective for the investigation of network dynamic processes such as epidemic diffusion or synchronisation (Van Mieghem 2010). Let us consider an undirected network. Usually it is rendered as a geometric abstract object called graph made of points (nodes, vertices) and lines connecting them (links, edges). More formally a graph is a pair $G = (V,E)$, where V is the set of vertices and E is the set of links: ordered couples (V_a, V_b) of vertices. Such a graph can also be identified by a symmetric $n \times n$ matrix A_G, called adjacency matrix, whose elements are defined as:

$$A_G(i,j) = \begin{cases} w & \text{if } \{i,j\} \in E \\ 0 & \text{otherwise} \end{cases} \tag{1}$$

w is the weight associated to the link. For an unweighted network $w = 1$.

For a square symmetric matrix, given a non-null vector x, if it is possible to find a scalar λ such that $Ax = \lambda x$, λ is called *eigenvalue* for A and x is the corresponding *eigenvector* (Lang 1970). The eigenvalue satisfies the equation: $(A-\lambda I)x = 0$ which has nontrivial solutions if and only if: $det(A-\lambda I) = 0$. The latter is known as

the characteristic equation of A (and the left member characteristic polynomial). There exist exactly n roots (not necessarily distinct) for this polynomial therefore an $n \times n$ matrix has n eigenvalues and n associated eigenvectors (each one having n elements). If the matrix is real (i.e. all its elements are real numbers) and symmetric (undirected network), its n eigenvalues $\lambda_1, \lambda_2, \ldots, \lambda_n$ are the real roots of the characteristic polynomial. The ordered set of the eigenvalues for A is called the *spectrum* of A: $sp(A) = \lambda_1, \lambda_2, \ldots, \lambda_n$ *with* $\lambda_1 \geq \lambda_2 \geq , \ldots, \geq \lambda_n$. The largest eigenvalue λ_n (also principal or dominant) is termed spectral radius.

A second matrix can be defined. Let D be the degree matrix, a diagonal matrix associated to the adjacency matrix A_G, whose elements are defined as:

$$D_G[i,j] = \begin{cases} \sum \deg(i) & \text{for } i = j \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

Then it is possible to define the Laplacian matrix: $L = D - A$. L is a symmetric $n \times n$ matrix (n = order of the graph G):

$$L_{ij} = \begin{cases} \deg(i) & \text{if } i = j \\ -w_{ij} & \text{if } i \neq j \end{cases} \tag{3}$$

(w_{ij} = weight of the edge ij, for an unweighted graph: $w = 1$ for all the edges; in all weighted cases *deg(i)* is the sum of the weights for the nodal links).

L is a real and symmetric matrix, therefore all its eigenvalues (μ_i) are real. If the network is not fully connected, the multiplicity of the null eigenvalue equals the number of the connected components in G. The spectrum of L is called the *Laplacian spectrum* of the network (Mohar 1991).

Eigenvalues and eigenvectors (both adjacency and Laplacian) of a graph are closely connected to its structural characteristics; they *summarise* its topology (Restrepo et al. 2006). More precisely, eigenvalues contain global information about the network, while eigenvectors contain local (nodal) information. This is the case, for example, of a number of nodal metrics such as eigenvector centrality (Bonacich 1987), Katz centrality index (Katz 1953) or PageRank (Brin and Page 1998), all calculated from the principal (largest) eigenvector of the adjacency matrix. The spectral analysis of the adjacency and the Laplacian matrix of a network can be a useful, and in many cases computationally more efficient, method to derive its main parameters. Among the many interesting conclusions of the wide body of studies in spectral graph theory we use here two results.

The first one deals with the identification of communities in a complex network. This is done by using the eigenvector associated to the second smallest eigenvalue of the Laplacian spectrum μ_2. This is called Fiedler vector (after Fiedler 1973), and renders, through its visual plot, the algebraic connectivity of the network. In essence, when sorting the vector in increasing order and plotting its values along with their rank index number, well separated modules, that are weakly linked between them, can be identified by looking at the gaps in the plot (Fortunato 2010). An example is given in Fig. 1 where an artificial network with two well defined components have been generated.

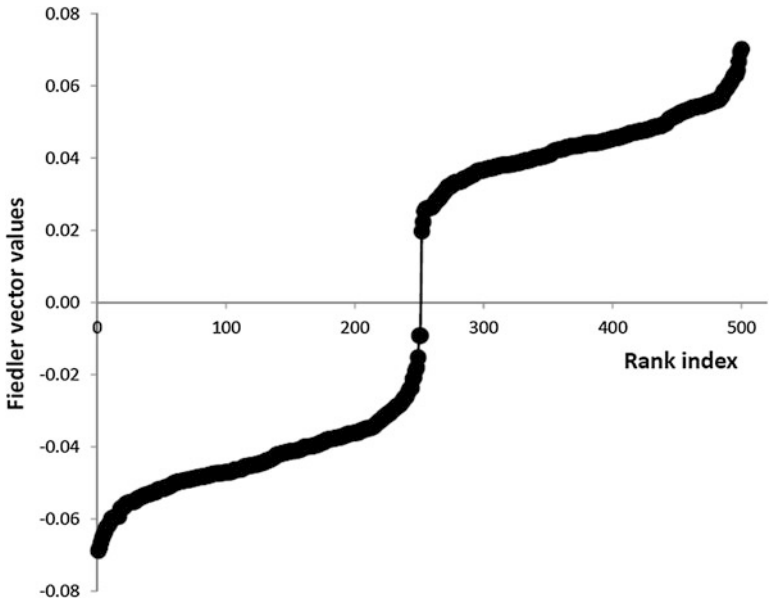

Fig. 1 Fiedler vector plot of an artificial network composed of two well defined communities

The second important result concerns the spectral radius, the largest (principal) eigenvalue of the adjacency matrix λ_N. This plays a crucial role in controlling the two dynamical processes described above: diffusion and synchronisation. In fact, it is found that the critical threshold for a SIS epidemic diffusion τ for an undirected graph is $\tau = 1/\lambda_N$ (Chakrabarti et al. 2008). For what concerns synchronisation a similar result holds for the critical coupling that turns out to be: $K_C \propto 1/\lambda_N$ (Restrepo et al. 2005).

No matter how we model the spreading of opinion and the establishment of a consensus, the largest eigenvalue of the adjacency matrix shows the properties of these processes on a complex network: the higher its value the lower their critical thresholds, or the higher its value, the easier is to inform and *convince* the actors in a complex social network.

4 Results and Discussion

Figure 2 shows the plot of the three ecosystems' Fiedler vectors with respect to their rank index when sorted in ascending order (for the sake of simplicity only the values for the unweighted networks are shown, those for the weighted versions follow the same shape). The comparison with Fig. 1 is quite clear. No trivial division in modules can be made. This reconfirms the results reported in Baggio and Del Chiappa (2013a, b) and gives a stronger argument to the idea that there is

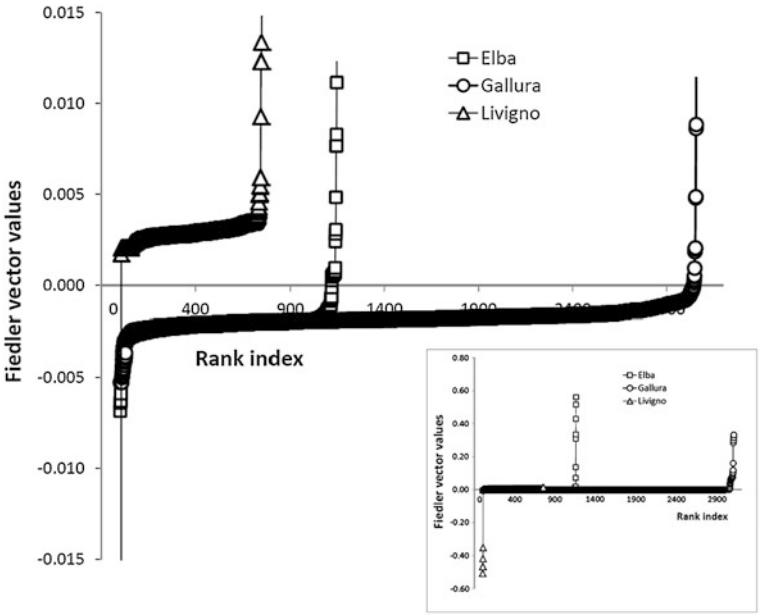

Fig. 2 Fiedler vector plot of the three digital ecosystems (for better readability only the central parts of the spectra are shown, inset contains the full graph)

Table 2 The inverse spectral radius for all the networks examined

	Weighted Ecosystem	Ecosystem	Real	Virtual
Elba	0.0292	0.0430	0.0434	0.0899
Gallura	0.0167	0.0433	0.0437	0.0503
Livigno	0.0194	0.0354	0.0428	0.0776

a strong coupling between the real and the virtual component of the systems examined. In fact, those results were obtained by employing a stochastic algorithm that, even if known and proved, is subject to statistical fluctuations thus containing a certain margin of error. Here the spectral analysis renders full information about the structural characteristics of the network. Therefore, the method (and this analysis) may be considered more reliable and trustworthy.

Table 2 contains the values for $1/\lambda_N$ (the inverse spectral radius) calculated for all the networks examined.

The values for the whole ecosystems are lower than those of their components and the minimum is attained by the more realistic model given by the weighted networks. This reconfirms the idea already put forward that the combination of real and virtual elements in a single well integrated system provides a more efficient substrate for the spreading of ideas or the reaching of a common agreement on some issue.

If we combine the results presented here with those discussed previously (Baggio and Del Chiappa 2013a, b), we have a stronger indication of the crucial

and central role of the technological manifestations of tourism firms in a destination in shaping its characteristics.

5 Concluding Remarks

The idea that today, in a group of organisations, and even more when these are parts of a system such as a tourism destination, the real and the virtual aspects play together in a fully integrated way is not new. Up until now many studies have shown this strict relationship, but only recently the concept of digital business ecosystem has been formally examined in a tourism context.

Here we have examined again the structural characteristics of a tourism digital ecosystem by using a different method. The spectral characteristics of the networks examined confirm the idea of structural strong cohesion between the real and the virtual components of a destination.

In these systems, as known, the diffusion of information and the reaching of a consensus on opinions that may be derived from policy measures devised by the destination governance entities is a crucial process. Here, with the aid of established algebraic methods we have shown how the ecosystem is more efficient in this regard, in agreement with the general results already obtained (Baggio and Del Chiappa 2013a, b).

Besides the theoretical interest, these results are important for anyone interested in the life and the development of a tourism destination. In fact, our study suggests that the setting of a good strategy needs effective communication channels that can be exploited when the basic mechanisms for achieving the desired level of knowledge and agreement are well understood. Moreover, as already discussed in other works (see e.g. Baggio and Cooper 2010), numerical simulations can be employed in order to find the most efficient configurations for ensuring an optimal *persuasion* dynamics.

This is important because while active participation and involvement of stakeholders in a strategic planning process is beneficial, a wide consensus does not necessarily translate into positive organisational results. In fact, in dynamic environments, higher levels of consensus may lead to lower levels of organisational performance. Thus, in such dynamic environments, it is more appropriate to allow stakeholders good autonomy in their strategic decisions to face the diverse situations and circumstances that might arise. Pressing for full consensus across functional strategies in dynamic environments can be costly and actually result in poor overall organisational performance (Kellermanns et al. 2005).

In this regard we think it would be quite interesting and useful to investigate more deeply the inter-organisational information, opinions and knowledge transfer and the relationship between the role and level of strategic consensus in a tourism destination and how this can affect its overall performance.

Aside from the theoretical and managerial contribution of the study, as with all research, there are limitations. The present study argues that the higher is the value

of the eigenvalue of the adjacency matrix the easier is to inform and convince the actors in a complex social network. However, it should be noted that many further mediating elements may work in order to link those actors. Further research, would be needed to investigate the nature of such elements and their influence on the process of information sharing and consensus development.

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Co-creation Through Technology: Dimensions of Social Connectedness

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Abstract With the increasing mobility and the emergence of social information and communication technologies, the tourist has turned into a connected consumer. In using the range of technologies available, tourists are now able to connect with their social circles to engage, share and co-create their tourist experiences online. While the significance of co-creation has been widely recognised, there is a major gap in understanding on what levels technology-facilitated co-creation can occur. This paper therefore aims to uncover the dimensions of social connectedness and develop a differentiated knowledge of how exactly tourists co-create through ICTs. The findings reveal six distinct dimensions that can be positioned on a social intensity continuum, ranging from disconnection to social co-living of the experience. In revealing social connectedness to everyday life and the home environment, this study highlights key implications for the existing theoretical understanding of tourist experience portrayed as a reversal from of the everyday life. Implications for further research and practice are discussed.

Keywords Connected consumer · ICTs · Co-creation · Social connectedness · Everyday life

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1 Introduction

Co-creation has become an important notion in tourism research and practice. The tourist as an empowered consumer has been recognised as the central element in this process determining the creation of experiences and value. In particular, with information and communication technologies (ICTs) as pervasive tools accompanying the increasingly mobile tourist consumer anywhere and anytime (Green 2002), the tourist can now co-create richer, personal and more meaningful experiences (Gretzel and Jamal 2009; Ramaswamy and Gouillart 2008). As a result, with the proliferation of mobile devices and social media (Fotis et al. 2011; Xiang and Gretzel 2010), the potential for technology supporting co-creation has reached a new extent. However, while much attention has been paid to understanding co-creation in the business context (Ramaswamy and Gouillart 2008), little emphasis has been placed on understanding the social co-creation processes that occur outside of the company domain, when tourist consumers connect, engage and share with their social circles through technology. Despite acknowledging the high potential of technology for maximising social co-creation (Neuhofer et al. 2012), recent studies lack to provide a clear understanding of how exactly the contemporary connected consumer seeks to co-create tourist experiences. Given this two-fold gap in knowledge, this study adopts a consumer-centric lens to explore technology-facilitated co-creation processes to identify dimensions of social connectedness. In developing these dimensions, this study contributes with differentiated knowledge of the extents to which consumers co-create through ICTs. To this end, the paper first discusses the theoretical foundations of consumer-centrism and co-creation theories as well as the impact of social and mobile ICTs on how the socially connected consumer co-creates. Second, the methodological approach by means of a qualitative in-depth enquiry is presented. Third, the findings are discussed revealing six social dimensions of social connectedness, which are graphically depicted in a new model. Finally, conclusions on the study's theoretical contributions are drawn, further research is suggested and practical implications for management are highlighted.

2 Theoretical Background

2.1 Consumer-Centrism and Co-creation

With an evolution in society, characterised by consumers becoming more active, powerful and involved, there has been a transformation in services marketing in the way the traditional company-consumer power relationship is formed (Ramaswamy 2009). The proliferation of ICTs has been one of the critical forces for the advancement of society and the growth of the empowered consumer. In facilitating access to information, transparency, processes and activities, ICTs have enforced an

unprecedented shift in companies, consumers, employees, stakeholders and other consumers connecting and engaging with each other (Ramaswamy 2009). By replacing the predominant goods-and service-dominant assumptions of the recent decades, co-creation has introduced new ways of *how* and *by whom* experiences and value are created. Central to this premise is that the consumer now is the main actor in both production and consumption (Ritzer and Jurgenson 2010).

Subsequently, co-creation, defined as a dynamic, collective and collaborative process and a joint value creation between the company and the consumer (Prahalad and Ramaswamy 2004) has thus introduced a new paradigm for experience creation. This advancement has been recognised in numerous emerging theoretical streams, including the notions of co-creation (Ramaswamy 2009), co-production (Chathoth et al. 2013) or the service-dominant logic (Vargo and Lusch 2004), which contribute to the current understanding of how contemporary experiences are created and constructed. More recently, scholars have introduced the customer-dominant logic as a new perspective recognising a shift from value creation in the business domain towards value creation within social experiences of the individual consumer (Heinonen et al. 2013). This paradigm acknowledges C2C co-creation as a key source of value creation, as consumers create experiences with each other. In summarising these notions, Helkkula et al. (2012) state that co-creation can encompass a multitude and diversity of social dimensions in a range of social contexts. For instance, individuals can engage with businesses, consumer communities or personal networks alike to co-create socially intense and meaningful experiences (Arnould et al. 2006).

2.2 Social and Mobile ICTs

In recent years, ICTs have been one of the main forces driving consumer empowerment and enabling new multiple facets of co-creation (Neuhofer et al. 2012). In particular, the Internet and the subsequent advances of the Web 2.0 have induced one of the most critical technological and social developments over the past years (Fotis et al. 2011; Xiang and Gretzel 2010). This change has turned the Internet into an immense platform of interaction opening new levels of engagement and collaboration (Sigala 2009). The plethora of interaction tools, including blogs, videos or social networking sites have encouraged individuals to participate, connect and engage and in turn co-create their experiences online (Ramaswamy and Gouillart 2008). In addition to the rapid social technological developments, there has been a massive increase in mobility (Egger and Buhalis 2008), which has not only shaped the physical movement of people, products and services but has caused a mobility of technology itself at the same time (Gretzel and Jamal 2009). Due to their ubiquity, mobile devices allow tourists to connect, access and retrieve information on the move anywhere and anytime (Green 2002; Wang et al. 2012). This combination of social and mobile innovations in tourism has led to new ways of how tourists can potentially connect, interact and co-create with companies and each other.

2.3 The Socially Connected Tourist and Co-creation

With the proliferation of ICTs, the potential for experiences to be co-created has 'exploded on an unprecedented scale everywhere in the value creation system' (Ramaswamy 2009, p. 17). This means that through ICTs, co-creation is no longer restricted to companies and consumers (B2C) but is enabled among consumers and social networks (C2C) on all levels. In fact, with consumers using ICTs to engage with their networks, there is evidence that co-creation increasingly takes place in the consumer domain (Grönroos 2008). In this vein, recent literature confirms that the range of ICTs available can facilitate traditional co-creation in a number of different ways (Tussyadiah and Fesenmaier 2009; Wang et al. 2012). One of the possible applications of ICTs it to allow tourists to experience the physical tourist environment and stay connected in the online space at the same time. By being *interconnected* to social networking sites, such as Facebook or Twitter, tourists can share, comment and co-create with friends, peers, tourism providers, and other consumers while being immersed in the tourism destination (Tussyadiah and Fesenmaier 2009). Tourists seek to *engage* with their social networks to support experiences (Kim and Tussyadiah 2013) and *exchange* information, updates and opinions (Neuhofer et al. 2012) as well as *maintain social relations* and sharing experiences with each other (Wang et al. 2002). It is evident that the notion of ICTs supporting experience co-creation is widely discussed. However, while many recent studies have focused on B2C perspectives on how companies facilitate co-creation through ICTs in tourism destinations and hospitality settings (Neuhofer et al. 2012, 2013), there is a gap in understanding from a consumer perspective, and on how exactly the connected tourist seeks to use social and mobile technologies to co-create the tourist experience. Moreover, while examples of co-creation have been mentioned in literature, a clear differentiation of the distinct dimensions in which technology-facilitated co-creation can occur is missing. It is with this rationale in mind, that this study aims to address these gaps and uncover the underlying dimensions explaining how consumers use ICTs to connect and co-create their experiences when travelling.

3 Methodology

To address the aim of the study, a qualitative enquiry was adopted as a particularly useful method to capture the the subjective experiences that occurs within the individual human being (Larsen 2007). For this purpose, qualitative semi-structured in-depth interviews were selected as the most suitable method to cover predefined queries whilst maintaining the necessary flexibility for participants to narrate their experiences. The interview instrument was established based on the literature, refined through pilot-testing and continuously adapted through an iterative interview process to allow for emerging aspects to be incorporated. The

sampling procedure followed a purposive sampling technique, as a common method in qualitative research when participants need to fulfil a set of prerequisites (Bryman 2008). In order to collect rich accounts and descriptions of technology-facilitated co-creation, participants who have been involved in the required situation need to be sought (Robson 1993). This means that highly technology-savvy users, as opposed to non-technology users, were critical for this research process. Accordingly, consumers meeting the following criteria had to be identified: (a) technology-savvy consumers (owners of smart phones and daily use of smartphone and social media), (b) prior experience of using ICTs for travel activities and (c) the use of ICTs for travel within the last 12 months to ensure the recollection of their experiences. Due to the need to recruit individuals fulfilling all these requirements, the geographical location was secondary. Rather it was essential to find participants meeting the criteria, for which purpose locations with a potentially high concentration of technology-savvy users, such as a university environment, were used for participant recruitment. This process resulted in a total of 15 semi-structured in-depth interviews that were conducted in May 2013 in a seaside-town in the UK, with each interview lasting between 50 min and 2 h and 20 min, with an average interview length of 1 h and 24 min.

All interviews were voice-recorded and subsequently manually transcribed verbatim by the researcher in order to allow for a rigorous coding and analysis process (Rubin 2004). Following Miles and Huberman (1994) principles of qualitative thematic analysis and guided by the research questions of the study, the data was coded through an exploratory multi-stage coding process, consisting of inductive brush coding of initial codes, coding-on, refining codes towards the development of the final themes and dimensions of the study. For this process, the computer software QSR NVivo 10 was used to transcribe, store, organise and manage the wealth of data. While in the qualitative enquiry, criteria, such as reliability and generalisability play a minor role (Creswell 2003), it is critical to consider reflexivity, contextualisation, prolonged engagement, thick description, audit trail, member checks and triangulation (Holloway and Brown 2012). By allowing for all these factors this study ensured to obtain thick descriptions and narratives, member checks with participants, as well as inter-coder reliability by independent coding validation of excerpts of the transcripts as well as a transparent and rigorous research process through an audit trail documenting the entire study (Patton 2002). As this research was of qualitative nature, it does not seek to make claims of generalisability beyond the specific context to the wider population but rather seeks for theoretical generalisation of the concepts presented (Holloway and Brown 2012). Table 1 outlines the socio-demographic profile of the sample. While the sampling procedure was purposive based on inclusion criteria, participants were selected to represent a diverse mix and balance of gender, age groups, education levels and nationalities.

Table 1 Socio-demographic profile sample

No.	Pseudonym	Gender	Nationality	Education	Age	Smartphone
1	Laura	Female	Dutch	A-levels	20	Samsung galaxy
2	Jane	Female	German	MA	29	iPhone
3	Martha	Female	German	BA	24	iPod
4	Veronica	Female	Chinese	MSc	40	iPhone
5	Sam	Male	British	A-levels	23	Samsung galaxy
6	Paul	Male	British	MSc	62	iPhone
7	John	Male	Indonesian	MSc	34	Blackberry
8	Sandra	Female	Greek	MSc	27	HTC
9	Teresa	Female	Indonesian	BA	23	HTC
10	Andrew	Male	Pakistan	MSc	30	Samsung
11	Dan	Male	Greek	PhD	45	Blackberry
12	Aaron	Male	Italian	PhD	32	iPhone
13	Steve	Male	Belarus	PhD	32	Samsung galaxy
14	Rachel	Female	German	MSc	24	Blackberry
15	Hanna	Female	Vietnamese	MSc	30	iPhone

4 Findings

The findings of the consumer-centric in-depth study reveal that co-creation through ICTs occurs on a number of distinct levels. This study contributes by developing six main dimensions of social connectedness, which can be depicted through two polar continuums ranging from high to low involvement and from solitary to socially connected. In positioning the findings on this two-fold continuum, the following six polar dimensions could be developed: (1) Social Connectedness versus Social Disconnectedness, (2) Social Intercommunication versus Social Interaction and (3) Social Co-Participation versus Social Co-Living, which are portrayed in Fig. 1 below. Next, all six dimensions are introduced, underpinned by quotes and discussed in detail.

4.1 Social Connectedness Versus Social Disconnectedness

Participants of the study report connectedness as a crucial part of their tourist experiences when being physically distant from home. Being connected through a variety of mobile devices, such as smartphones and tablets, tourists seek to maintain a link to their everyday life and their mundane routines. While tourists want to fully immerse themselves into the experience at the destination, social connectedness with the home environment permits them to remain in contact with their social network not only for being updated, but also to avoid feeling spatially and temporarily isolated from their everyday lives. Many participants report the

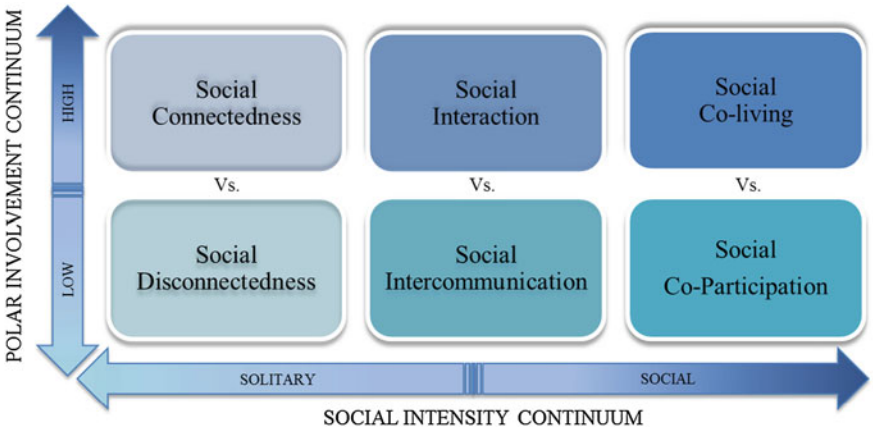

Fig. 1 Dimensions of social connectedness

importance of being able to stay in touch with family, friends and also the work community:

> While travelling, call back the family and I also still use it as normal, like answer the email and update the work. Because in the past if you don't have the smart phone, you are stuck when you were travelling (…) So like this, when I travel in another country, I work and update like normal, and people don't feel like 'oh she is on holiday or she is on leave I have to wait another week to get the answer'. (Hanna)

Social connectedness provides tourists a sense of attachment to home. Participants state that while they are physically away, mentally they have the feeling that they are still present there. Social connectedness demonstrates to be crucial for tourists to maintain and their social relationships and co-create their experiences. It seems to provide a sense of security and comfort, especially in situations when social relations on-site, e.g. with other tourists, are scarce. The possibility of connection with the own network, seems to partially replace the need for physical encounters with strangers, which indicates a shift of interactions to the familiar online social space.

> If you don't and can't interact with the people around you, because you might not know them, then it is nice to have a conversation or have this kind of sense that other people are still around you, even though it is kind of virtual, it gives you kind of a security, and then you are more willing to share the experience. (Rachel)

In contrast to the desire for consistent social connectedness and the blurring of everyday life and the tourist experience through ICTs, the findings also indicate a polar view, suggesting an equal need for tourists' disconnectedness. Participants emphasise that the state of being connected to and co-creating with the social network often represents an inhibitor of switching off, preventing escapism from home and enjoying the 'real experience'. Due to the convergence of everyday life with travel, participants report an interference of their travel experience:

> Because if I connect so much it is not kind of travelling anymore, you are, I don't know, I just really like I want to get off the daily life, so I seek the reality, because if you stick so much with technology you don't really enjoy the place you live. (Hanna)

> I think that somebody who uses technology that much to that extent, cannot actually enjoy that places that much, because you are so caught up in sharing it with other people rather than enjoying it yourself that much. (Rachel)

The findings suggest that ICTs can be key tools in that they enable tourists to maintain social connections and allow for co-creation processes to occur. In contrast, while tourists desire connecting with everyday life, the polar view suggests the need for escapism from home, living the 'real experience' and maintaining co-creation with individuals, such as tourists or tourism providers, in the physical surroundings.

4.2 Social Intercommunication Versus Social Interaction

In case social connectedness with the online network is established, the findings suggest a further differentiation of two co-creation processes. Depending on the intensity of the encounter, there appears to be a continuum from social intercommunication and to social interaction. While terminologically often coined as interaction, participants point out that social media facilitated interactions frequently lack a deeper dialogue. With co-creation aiming at creating interactions that are meaningful to the individual, interactions through social networking seem to lack in depth. One participant exemplifies this frequently mentioned perception.

> The deep a dialogue can be is 'are you in London, amazing, have you been there' 'no I'm not going there' 'ok fine go there next time' because the rest can be, 'I like it, wow, fantastic, where are you'. I mean the question is, is that real interaction? (…)

> A collection of feedback and there is no possibility of creating a third meaning. And when I post pictures of things when I share things about my travel experience the best comment I have "very nice" but we are not creating a meaning. (Aaron)

The question therefore is what makes a technology-facilitated interaction and experience co-creation processes meaningful. While there is a two-way interaction stream of one person uploading and sharing a picture that triggers the response of another person to reply (e.g. through Facebook, Twitter, Instagram), participants state that this does not account for a full interaction or replace meaningful exchanges and dialogues as they occur in the real environment. Accordingly, there is need to draw a line between two forms of social encounters, namely *social intercommunication*, as a brief and light form of contact and messaging and *social interaction*, as a much deeper form of dialogue in which two parties exchange and create a meaning.

> I think interaction should create a meaning, I have a position, you have a position and we discuss about it and then there is a third position coming up which is blended. (Aaron)

On the other end of the continuum, social interactions are often manifested as a prolonged dialogue that has been triggered by an experience shared for online. One participant reports for instance reports that sharing pictures has led to meaningful discussions on a mutual subject which added socially constructed value to the actual physical tourist experience.

> It is slightly overall experience changing just because I can share it a little bit and then we just talk about it to say, my friend "oh I can't believe you had that" "yes" and "I have been to your house and it was nothing like that" or something like that. (Sam)

In summary, technology-facilitated social interactions can occur to different extents. While technology allows for an ease of communication, it partially occurs on a superficial level with short messages or comments being exchanged. To render co-creation more engaging, there is need for deeper interactions online that allow for proper discussions, outcomes and meanings to be exchanged.

4.3 Social Co-participation Versus Social Co-living

In increasing the intensity of co-creating tourist experiences, the findings indicate that technology allows tourist consumers to not only connect and interact but allows for immersive form of co-creation in which the network can become part of the experience itself. To reflect this new phenomenon which has not been recognised in the literature so far, the new terms social co-participation and social co-living have been coined. These reflect the new process of co-creation through technology, in which the individuals in the connected social network become virtual co-participants of the tourist's lived tourist experience. One participants describes the notion of intense co-creation through social participation, as a sensation of others '*being there with you'* during travels. Sharing is a central premise to the social experience, and by sharing the own experience, technology is a key facilitator for other people to participate in the experience at the very moment of its occurrence. While traditionally experiences were primarily shared post-travel upon the return home, technology allows people to co-create and become virtual travel companions of the experience in real time. One participant reports:

> Just the feeling to have the other people participating in your journey even though they are not there but to share your experience with them because you can't share it with no one else because no one else is there. I mean you can make friends on your journey but then you share it with your virtual friends instead of sharing it with a person who is not there. (Jane)

Additionally, participants highlight the example of people from the social network who socially co-construct the experience online.

> Yes I just want to make sure they find those really nice places, that they might have not gone to because that might have not been their choice of things to do. (Rachel)

> I don't even consider to try that food during my planning, and because my friend told me that I have to try this food or this drink, it inspires you 'ok maybe I can try things that they recommend me' so it gives me information, so it is two ways. (Teresa)

Moreover, in allowing the social network to become real participants of the experience, the online shared experience can become real to an extent that people are not only participating but essentially co-living the travel moment. This notion can be defined as 'co-living', allowing connected people to live the experience through the tourist's eyes:

> Some others just travel through my eyes, so they have never had the chance to go to. It is tele-presence, it is like going to the movies and watch a film about Bollywood and you feel that you are in India. (Dan)

In summary, the findings indicate that co-creation through ICTs can be taken to a socially intense level that makes it possible to virtually co-live the tourist experience. When sharing experiences, the connected tourist can allow people to communicate, interact, participate, re-construct experiences as well as lend people virtual eyes to co-live tourist moments from the distance in the home environment.

5 Discussion

This study aimed to explore co-creation processes through technology from a consumer perspective to identify dimensions of social connectedness. Beyond recognising the potential of co-creation, this study makes a contribution in that it empirically explored and uncovered a distinctiveness of technology-facilitated social co-creation processes taking place. It has revealed six overall dimensions of social connectedness. Figure 1 demonstrates that these dimensions, varying in intensity, can be placed on a vertical polar continuum in terms of low and high involvement, and on a horizontal continuum ranging from solitary disconnectedness to a highly connected and socially intense state. Building on the principles of co-creation, this study provided a consumer-centric lens of co-creation in a technology-facilitated context. In revealing these distinct dimensions, this paper makes a theoretical contribution to the existing co-creation discourse in a number of ways. While the existing literature has argued that ICTs facilitates co-creation (Ramaswamy and Gouillart 2008), this study contributes by revealing that co-creation is *not a single process* but can occur on *multiple levels and intensities*. In that it proposes six distinct dimensions of social connectedness, this study also contributes in putting forward new knowledge suggesting that it is not sufficient to use the popular term co-creation *per se*, but rather recognise its nuances and understand the different ways in which tourist co-create through technology. In that it looks at co-creation processes from an inherently consumer-centric perspective, this study goes beyond B2C co-creation, and reveals how tourists co-create within their own social circles.

In line with recent work (Tussyadiah and Fesenmaier 2009; Wang et al. 2012, 2013) this study has confirmed that ICTs can constitute a key instrument to facilitate richer and more socially intense experiences. Particularly mobile technologies benefit tourists to be constantly connected and co-create experiences and value with multiple individuals. As more social and mobile ICTs are at the disposal of the contemporary consumer, social connectedness can be potentially facilitated as the tourist connects, communicates, interacts, co-participates and co-lives experiences together with the social network online. Through co-creation with the social network, technologies support tourist consumers not only in the physical destination (Neuhofer et al. 2012), but allow them to stay connected and in touch with their everyday environment at the same time. These findings suggest a major contradiction to the long tradition in tourism literature suggesting the escapism from the routines of everyday life as one of the key motivational triggers for travel (Cohen 1979). While literature substantiates a clear boundary between travel and the everyday life, this study suggests that these boundaries dissolve, as tourists increasingly connect and co-create with their network and home environment online.

6 Conclusions and Implications

The power of the Web 2.0 and the increasing mobility of technologies have led to the emergence of a connected social and mobile consumer who is able to co-create tourist experience to a new extent. In addressing the gaps in the existing literature, this study had the aim to explore technology-facilitated co-creation and develop a differentiated understanding of co-creation processes by identifying six distinct dimensions of social connectedness. While human social encounters with other tourists or tourism providers remain a significant part of the overall social dimension of the tourist experience, this study highlights that technology can potentially add further social dimensions of co-creation through the connection to the social network online. In this vein, it is not the technological tools per se but rather the social connection to people online that render the experience more social. In that the findings indicate a connection to the everyday life, this study has major implications on the existing theoretical assumptions portraying the tourist experience as an escapism from and reversal of the everyday life (Cohen 1979). In contrast to the existing the understanding, this study highlights that tourists use technology primarily as a means to connect with the everyday life for multiple purposes, as to stay up-to-date, not losing touch with people, maintain social relations and share while undergoing tourist experiences on-site. The key question is thus whether technology is a potential catalyst of change breaking down the hitherto clear boundaries tourism and everyday life. In addition to the potential of technology for social connectedness, the study highlights that there is also a contrasting movement towards disconnectedness from the social network online. In this vein, technology is perceived as a diminishing factor in the overall tourist

experience when it is considered to be too immersive or distracting and detaches the tourist from the real physical surroundings.

This study makes a number of critical contributions to tourism theory and practice. On theoretical grounds, this study contributes to the recent studies exploring mobile technologies for experiences (Wang et al. 2013) and the value of technology facilitated co-creation (Neuhofer et al. 2012), by empirically exploring social dimensions of co-creation through technology. This study adds knowledge by providing dimensions of social connectedness which can be used as a basis for further research in the C2C co-creation as well as technology domain. In acknowledging the limitations of this study in terms of a qualitative and hence small sample size, the need for further research of both qualitative and quantitative nature is suggested. For instance, studies could build on the findings by analysing and breaking down the social network of friends, peers, family and companies to understand their specific roles and potential differences in co-creation processes of the tourist experiences. A further aspect worth exploring is the notion of experience co-living from the view of those 'being at home' to understand the effect of socially shared experiences on them for inspiration, decision-making and travel planning alike. Moreover, the idea of constant social connectedness in contrast to the notion of escapism from everyday life is a critical notion worth exploring in future studies. To complement qualitative enquiries, quantitative studies are needed to test the presented findings on a larger scale by looking for possible effects of socially intense co-creation on value extraction or satisfaction. For the industry and management context, this study suggests a number of practical implications. While experience co-creation practices are realised throughout a number of industries, co-creation (Binkhorst and Den Dekker 2009), and especially technology-facilitated co-creation (Chathoth et al. 2013) are still limited in tourism. Therefore, this study suggests exploring the potential of technology as a key tool to facilitate more opportunities for social co-creation experiences for the tourist consumer. Thereby, it is of particular importance to support consumers to co-create experiences outside the company domain with each other (C2C). This means that first and foremost the technological requirements need to be fulfilled that allow the tourist to be connected, for instance, through wireless access in hotel rooms, at airports and wireless destinations. If successfully facilitated, important implications for businesses can unfold, as consumers can more effectively connect on the move and co-create an enhanced experience and value, not only with the own network but also with the tourism provider online.

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Part V
Online Reviews

An Exploratory Study on Restaurant Review Websites

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Abstract Along with the rapid development of online marketing, online restaurant review websites provide a convenient channel for online users to share their dining experience. This research aims to establish a guideline for restaurant review websites. Using an Importance-Performance-Analysis (IPA), the paper examined online users' perceived importance and performance of thirty-two website attributes. Different perspectives were also found between content contributors and content browsers. Research findings are expected to help industrial practitioners bridge the gap between customer needs and review website development, which in turn benefits restaurant operators, review website owners and online users.

Keywords Restaurants review website · Online experience sharing · Importance-performance analysis · Website features

1 Introduction

Since 1990s, online technology has been adopted for restaurant promotion in the U.S. market (Murphy et al. 1996). Nowadays, many food and beverage companies have shifted their marketing strategies to online market practices (Chester and Montgomery 2007). The Internet has become an essential tool for information exchange between consumers and practitioners. The emergence and growth of

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online platforms has enabled an extraordinary volume of content to be created and shared among a geographically disperse population. A growing number of customers tend to refer to review websites for pre-purchasing decisions and disseminate their shopping experience afterwards. According to a recent survey, 41 % (39 %) of the respondents have read positive (negative) comments on review websites. 88 % of them have claimed that these reviews have influenced them to convert (Dimensional Research 2013).

Many consumers are seeking online guides and social media websites for dining advice (Pantelidis 2010). Belgrade evidenced the impact of online platforms and demonstrated that 89 % of consumers relied heavily on online reviews as a primary source of restaurant information. In particular, restaurant review websites provide consumer reviews varying in content and valence. Online communication does not only bring trust and relationship commitments, but also negative consequences such as customer disappointments and complaints (Nusair et al. 2012). Meanwhile, operators also benefit from online content in brand positioning, brand establishment and consumer demand creation (Mittal and Baker 2002). Restaurant review websites assist operators in determining consumers' online behaviour, identifying their needs and taking actions with respect to customer complaints. MarketLine reported that the world restaurant industry generated nearly $1.6 trillion in revenue in 2010. The world restaurant industry is expected to reach $1.8 trillion by 2015. In particular, China as a fast developing region deserves academia's attention to investigate its restaurant industry. Macau, a special administrative region of China with over 28 million tourists has demonstrated its fast development in hospitality industry.

Hospitality research is beginning to understand the consumers' post dining experience behavior, and the focus has been shifted to understand their online behavior. Having identified the critical role of online interpersonal influence, marketers in the competitive restaurant industry have begun to seek business opportunities of restaurant review websites.

In spite of the importance of understanding a restaurant review website, little research has been published addressing the restaurant review website functions. Practitioners will be better able to prioritize tasks, allocate resources and cater for customer desires by investigating their needs and expectations. Having identified this gap, the current study focuses on developing a restaurant review website function list and perceiving the importance and performance from online consumers. To achieve the research objectives, the following research questions are posed:

- What are the functions of restaurant review websites?
- How do customers perceive the importance and performance of these website attributes in Macau and Hong Kong?
- What are the difference between online browsers and content contributors?
- How does restaurant practitioners adopt review website for their restaurant promotion?

2 Literature Review

Web 2.0 technologies have inevitably changed consumers' online information search, collection and sharing behaviours (Chaves et al. 2012), which provides effective online communication channels to online users (Xiang and Gretzel 2010). In particular, in the context of restaurant industry, Web 2.0 techniques have enabled Internet users to move beyond traditional offline recommendations to online user-generated content for restaurant information and dining experience. Developing in parallel with the rise of Web 2.0, customer online evaluation system has been tremendously popular and gained much attention in recent years.

Many customers are seeking restaurant information on online guides and Social Medias (BizGrader 2010). A survey conducted by Technorati (2008) examined the main themes of more than 70 million online diaries, out of which "food and beverage" was ranked as the third popular topic. Their study also implied the importance of online promotion in the restaurant industry. The impact of eWOM on restaurants has drawn much attention in the academy and industry. Gayatree et al. (2010) conducted a structure analysis to better understand customers' online review trends. Customers are motivated to disseminate positive eWOM as a result of pleased dining experience, which in turn help restaurants to build up the brand and reputation (Jeong and Jang 2011; Pantelidis 2010; Zhang et al. 2010). This study categorize online consumers into two categories, content contributors is a user who shared their comment/review/rate about their dining experience online, and content browsers who had only consumed online content but never contributed.

Nevertheless, it is noteworthy that only a website with good functions and design quality will encourage eWOM engagement. Bad-designed websites and usability barriers may expel 65 % of online users (Souza et al. 2000). In particular, the advance of restaurant review websites and social media reviews add to existing complications in the restaurant industry, which calls for a need for restaurateurs and web operators to improve the design of restaurant review websites (Pantelidis 2010).

Restaurant review websites as a popular intermediate connect restaurants and customers. It provides an information exchange platform for customers to exchange their dining experience and brings opportunities to restaurants for brand management. Existing literature has widely filled the research gaps in understanding eWOM engagement and its impact on restaurants. It also raises the question of how the marketers should adopt these findings in restaurant promotion. While the topic of review website has drawn much attention in the restaurant industry, discussions on website structure and customer preferred functions still have been overlooked by academies (Pantelidis 2010). Gayatree et al. (2010) summarized four salient factors of restaurant reviews, i.e., food, service, price and atmosphere. Currently, most of the restaurant review websites provide relevant functions to support content delivery on these frequently mentioned factors. While review contents have been widely explored in existing literature, studies on functionality of restaurant review websites has remained relatively limited. Consumers' expectation compare with website actual performance is overlooked by

previous research, Importance-Performance analysis (IPA) technique was developed to perform comparison of performance rating quality to the importance rating given by customers for the various quality items being measured (Martilla and James 1977). This technique has been widely adopted in hospitality field (Qu and Sit 2007; Wong and Law 2003; Lee and Lee 2009). This study makes an attempt to fill this research gap by establishing a function list of restaurant review websites. In particular, the research has prioritized these functions in consumers' perceptions and compared the difference between content contributors and content browsers.

3 Methodology

This research established a guideline to assist website designers on restaurant review website development. The listed website attributes were mainly collected from Restaurant Engine (2012), Entheos (2012) and existing Asia restaurant review websites such as Openrice.com and Dianping.com. Thirty-two attributes were identified base on the investigation of these two websites and the list was reviewed by three expertises in hospitality and tourism field to obtain the validity and reliability of the list.

The questionnaire started with a screening question to target online users with dining information searching experience. The second question was designed to obtain respondents' perceptions on the collected functions of restaurant review websites. The respondents were asked to rate the importance (1 = least important, 5 = most important) and performance (1 = very poor, 5 = very good) according to their previous experience. Their demographic profiles were collected at the end of the questionnaire. The questionnaire was produced in both English and Chinese versions, using a back-to-back translation procedure to reduce possible translation errors. It was first drafted in English and then translated into Chinese. The translated version was then back-translated into English by another bilingual translator who had postgraduate degree in Management related field to ensure accuracy.

An online questionnaire was distributed by a snowball sampling method from 10 April to 22 May 2012 in Macau. Only the respondents who have dining information search experience were selected. The data were mainly collected from residents in Hong Kong and Macau. Finally, 184 usable questionnaires were collected, coded and analysed for the research purpose.

4 Findings

Table 1 demonstrated the demographics of the 184 respondents. Compared with males, more female respondents searched dining information online. The majority of respondents (74.0 %) were aged between 19 and 24. Most of the respondents had a monthly income below 8,000 MOP.

Table 1 Demographic characteristics of respondents

	Content contributors (%)	Content browsers (%)	Total (%)	χ^2	df	p
Gender (n = 179)				0.037	1	0.847
Male	16 (25.4)	31 (26.7 %)	47 (26.3 %)			
Female	47 (74.6)	85 (73.3 %)	132 (73.7 %)			
Age (n = 181)				9.168	4	0.057
18 or less	2 (3.2)	8 (6.7)	10 (5.5)			
19–24	44 (71.0)	90 (75.6)	134 (74.0)			
25–34	6 (9.7)	16 (13.4)	22 (12.2)			
35–44	8 (12.9)	3 (2.5)	11 (6.1)			
45–54	2 (3.2)	2 (1.7)	4 (2.2)			
Education (n = 169)				17.476	3	0.001*
Completed secondary/high school	21 (37.5)	77 (68.1)	98 (58.0)			
Completed diploma/ college/university degree	23 (41.1)	28 (24.8)	51 (30.2)			
Completed postgraduate degree	10 (17.9)	8 (7.1)	18 (10.7)			
Others	2 (3.6)	0 (0.0)	2 (1.2)			
Income (n = 172)						
8,000 MOP or less	30 (50.8)	56 (49.6)	86 (50.0)			
8,001–11,000 MOP	0 (0)	3 (2.7)	3 (1.7)			
11,001–14,000 MOP	5 (8.5)	8 (7.1)	13 (7.6)			
14,001–17,000 MOP	4 (6.8)	4 (3.5)	8 (4.7)			
17,001–20,000 MOP	0 (0.0)	6 (5.3)	6 (3.5)			
20,001–23,000 MOP	1 (1.7)	1 (0.9)	2 (1.2)			
23,001–26,000 MOP	2 (3.4)	4 (3.5)	6 (3.5)			
26,001–29,000 MOP	2 (3.4)	3 (2.7)	5 (2.9)			
29,001–32,000 MOP	1 (1.7)	0 (0.0)	1 (0.6)			
32,001–35,000 MOP	0 (0.0)	2 (1.8)	2 (1.2)			
35,001–38,000 MOP	0 (0.0)	1 (0.9)	1 (0.6)			
38,001–41,000 MOP	0 (0.0)	1 (0.9)	1 (0.6)			
41,001 MOP or above	6 (10.2)	7 (6.2)	13 (7.6)			
Prefer not to answer	8 (13.6)	17 (15.0)	25 (14.5)			
Country of Residence (n = 184)				2.179	3	0.536
Mainland China	10 (15.6)	23 (19.2)	33 (17.9)			
Hong Kong	11 (17.2)	12 (10.0)	23 (12.5)			
Macau	41 (64.1)	80 (66.7)	121 (65.8)			

Note *Significant at $p < 0.05$

The Chi-square test was adopted to test the consumers' difference among their age, gender, education and country of residence. The income category was ignored in Chi-square test, which includes many empty values not suitable for Chi-square test. The findings showed significant difference between the content contributors

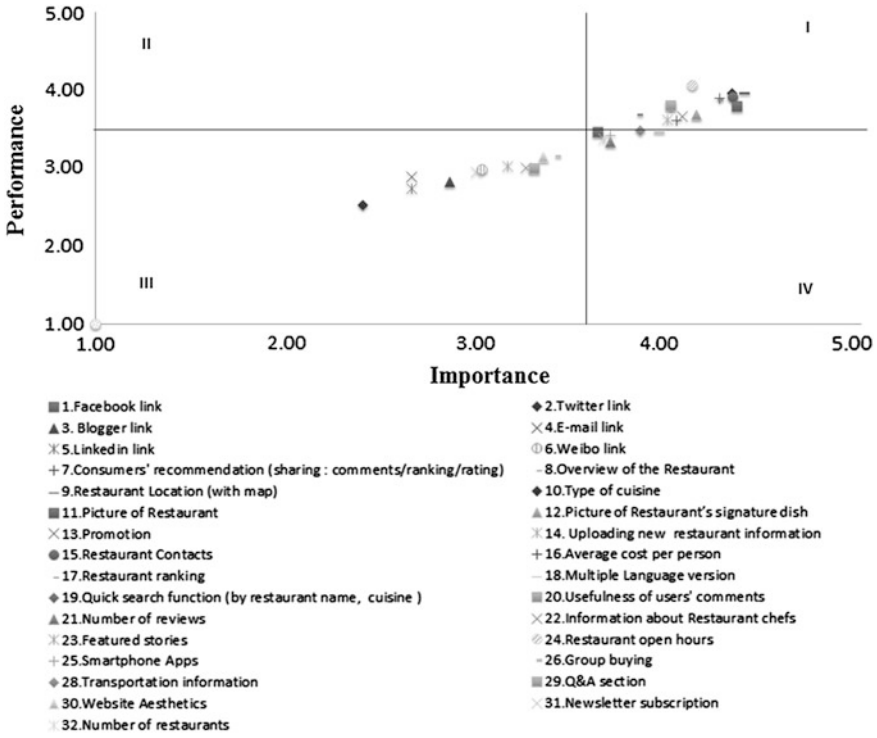

Fig. 1 Importance-performance analysis grid of restaurant review website attributes

and content browsers in their educational background. While the majority (68.1 %) of the content browsers graduated from high school, 41.1 % of the content contributors hold an undergraduate degree.

Figure 1 illustrates the IPA result of the thirty-three function attributes for restaurant review websites in Hong Kong and Macau. Quadrant I (the "keep up good work" quadrant) identified thirteen attributes, i.e., "Restaurant ranking", "new restaurant information", "Average cost per person", "Usefulness of users' comments", "Promotion", "Picture of restaurant's signature dishes", "Picture of the restaurant", "Consumers' recommendation (comments/ranking/rating)", "Overview of the restaurant", "Restaurant open hours", "Restaurant contacts", "Type of cuisine", and "Restaurant location (with map)". These features were the top priority rated by online users and were considered satisfactory in meeting their needs. The result primarily attributed the successful factors for user satisfaction to the core functions supporting detailed restaurant information and comprehensive reviews. To keep competitiveness and sustain achievements of review websites, operators are obliged to make effort on improving these functions related to content delivery.

Quadrant II (the "possible overkill" quadrant) captured no attribute as being of low importance with relatively high performance. Website operators, as indicated in the finding, did not allocate resources to the attributes with low priority and appropriately targeted on the key features of website design.

Twelve attributes fell into quadrant III (the "low priority" quadrant), including "Twitter link", "Linkedin link", "E-mail link", "Blogger link", "Weibo link", "Newsletter subscription", "Featured stories", "Restaurant chefs' information", "Q&A section", "Website aesthetics", "Membership management" and "Group buying". These features, although the performance was below the mean score among all the attributes, were perceived relatively less important by the users. The results revealed that most of the supportive functions of social networking connections were not favourable. Besides, while customers were keen on the comprehensiveness of the review content, they merely focused on the restaurant and food, while did not put too much emphasis on other additional but irrelevant information such as the featured story, the chef, the Q&A option and etc. In addition, website interface and membership were considered a low priority as well.

Finally, quadrant IV (the "concentrate here" quadrant) identified six attributes: "Facebook link", "Number of restaurants shown", "Number of reviews", "Transportation information", "Smartphone apps" and "Multiple language". These attributes were perceived critically important, yet were not being performed to the same standard. Firstly, although other functions of social networking connection were all identified in the low priority quadrant, "Facebook link" was considered an important feature of restaurant review website in Hong Kong and Macau. Secondly, great importance was placed on the transportation information. While restaurant review websites generally provided considerable information on the restaurant and food, the transportation information was found to be insufficient. Thirdly, "number of restaurants" and "number of reviews" were perceived important but under performing, which called for a need to elaborate the participation level and popularity of the website. Lastly, special attention needed to be directed towards the ease-of-use of the review website. Website operators might incorporate mobile applications and build in multiple language support to improve accessibility and navigational ease.

Furthermore, the key to sustainable competitiveness of website development lies in user participation. To capture the business opportunity and promote eWOM engagement, marketing professionals and website operators need to understand how customers utilize review website to seek and share restaurant information. Table 2 presented the importance scores of restaurant review website attributes and compared the perceptions between content contributors and content browsers.

As shown in Table 2, comprehensive information on restaurants and foods was the top priority rated by both content contributors and browsers. The users demanded high-quality website features to provide restaurant information such as the location, contact and infrastructure, as well as food information such as the type of cuisine and signature dishes. Besides, significant differences were found

Table 2 Perceived importance of restaurant review website attributes

Restaurant review website attributes	Content contributors			Content browsers			t	Sig
	N	Mean	s.t.d.	N	Mean	s.t.d.		
1. Facebook link	62	3.58	1.001	118	3.65	1.165	−0.412	0.681
2. Twitter link	61	2.51	0.994	118	2.31	1.082	1.223	0.223
3. Blogger link	63	3.05	1.197	119	2.75	1.202	1.603	0.111
4. E-mail link	63	2.95	1.224	118	2.78	1.227	0.903	0.368
5. Linkedin link	62	2.68	1.113	116	2.60	1.171	0.408	0.683
6. Weibo link	63	3.05	1.211	116	3.00	1.265	0.244	0.807
7. Consumers' recommendation (comments/ranking/rating)	63	4.13	0.871	119	4.38	0.770	−2.000	0.047*
8. Overview of the Restaurant	63	4.05	0.771	118	4.35	0.831	−2.371	0.019*
9. Restaurant Location (with map)	63	4.35	0.883	117	4.44	0.875	−0.632	0.528
10. Type of cuisine	63	4.21	0.806	117	4.39	0.830	−1.455	0.148
11. Picture of the restaurant	63	4.22	0.832	118	4.20	0.920	0.136	0.892
12. Picture of signature dishes	63	4.19	0.913	118	4.13	0.966	0.428	0.669
13. Promotion	63	4.06	0.801	118	4.08	1.006	−0.087	0.931
14. Uploading new restaurant information	63	3.87	0.924	118	4.08	1.022	−1.316	0.190
15. Restaurant contacts	63	4.21	0.936	119	4.47	2.831	−0.720	0.473
16. Average cost per person	63	4.16	0.766	118	4.00	1.004	1.095	0.275
17. Restaurant ranking	63	3.87	0.975	118	3.80	1.026	0.485	0.628
18. Multiple Language version	61	3.87	0.846	119	3.76	1.097	0.701	0.484
19. Quick search function (by restaurant name, cuisine)	63	3.87	0.907	118	4.06	1.040	−1.199	0.232
20. Usefulness of users' comments	62	3.97	0.905	119	3.90	0.978	0.459	0.647
21. Number of reviews	63	3.59	0.978	117	3.75	1.025	−1.046	0.297
22. Information about Restaurant chefs	63	3.35	1.003	119	3.18	1.047	1.075	0.284
23. Featured stories	63	3.22	0.958	118	3.11	1.011	0.723	0.470
24. Restaurant open hours	63	4.06	0.801	119	4.18	1.005	−0.771	0.441
25. Smartphone Apps	63	3.46	1.060	118	3.83	1.200	−2.056	0.041*
26. Group buying	63	3.38	0.958	119	3.43	1.176	−0.276	0.783
27. Membership management	61	3.31	1.057	119	3.44	0.997	−0.783	0.435
28. Transportation information	61	3.87	0.957	117	3.88	1.018	−0.073	0.942
29. Q&A section	63	3.41	1.042	115	3.23	1.124	1.086	0.279
30. Website Aesthetics	63	3.46	0.997	118	3.31	1.066	0.954	0.341
31. Newsletter subscription	63	3.02	0.871	118	2.97	1.008	0.275	0.784
32. Number of restaurants	63	3.62	0.941	119	3.66	1.029	−0.234	0.815

Note * Significant at $p < 0.05$

between the two groups of respondents in three factors: "Consumers' recommendation (comments/ranking/rating)", "Overview of the restaurant" and "Smartphone Apps", all of which received a higher importance score from content browsers. With an intention to seek advices from others, content browsers were largely more concerned with recommendations, content usefulness and accessibility.

Therefore, to enhance the features on consumer recommendation, brief overview of the restaurant and mobile applications may invite more readers to consume online contents. In addition, to maintain an active environment of knowledge sharing, website operators should strive to improve the features of content delivery, especially the functions regarding restaurant and food information. This way, practitioners can better tailor-make their marketing tactics, cater for the needs of content contributors and encourage the users to engage in eWOM communication.

5 Conclusion and Implications

This research is significant to the literature as it provides a timely update of the essential functional attribute list for restaurant review websites. The current work contributes to the literature as a first attempt to establish essential functional list for review website design. This update is important as it extends the study from the literature (Gayatree et al. 2010) and look at the review website functional attributes from the customer's perspective. In addition, this study implied the difference between content contributors and content browsers for their perceived importance of restaurant review website attributes.

Research findings extend the existing literature in regards to the online user review behaviour. Prior research has laid the foundation of the ways that how users review product online (Gayatree et al. 2010). However what is important to diners to select one particular site to facilitate their restaurant search is that the user must meet their functional and emotional needs on the provided platform. Hence, the availability of user valued functional attribute and its performance plays an important role in users' decision making process. The research outlined thirty-three functional attributes which commonly adopted by restaurant review website operators. Thirteen of them were revealed as the core functional list and well performed attributes from the user's perspective. It found that consumers seek information on unique theme and signature dishes, restaurant location, promotions and opening hours. Additionally, the visual information on a review website plays a marketing tool for website promotion to the potential customers.

The popularity of a review website depends on the comprehensiveness of its restaurant information provision and number of registered members. Attracting content browsers become as content contributors is crucial for restaurant review website promotion. The study compared the perceived important attribute list between content contributors and content browsers, these users demonstrated a difference based on the level of importance on certain attributes. The users who had no experience of sharing their dining experience valued "others users comments", and the "availability to view the web information on mobile devices" more important in comparison to the "content browser". This suggested review website operators should offer more incentives to encourage new users to post the review online, further to turn the content browser into content contributor.

6 Limitations

Some related questions on restaurant review website development have not been investigated. As such, this research has a couple of limitations that could be addressed by future studies. The current study provides comparison between content contributor and content brewers, a future study could conduct with a larger sample size to further extent the study on comparing the difference between these two groups of consumers. In addition, a future study may consider categorizing the customers including their searching purpose to further investigate customer interests on restaurant review websites.

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Measuring Hotel Service Quality from Online Consumer Reviews: A Proposed Method

Edward Boon, Michelle Bonera and Alessandro Bigi

Abstract This paper proposes a new method to measure hotel service quality from online consumer reviews and ratings. In essence, a word frequency analysis is performed on comments collected from a website such as TripAdvisor, and these frequencies are used to obtain a score for each of the following dimensions: *Room*, *Facilities*, *Surroundings*, *Employees* and *Reliability*. A comparison of scores can be made based on the ratings that consumers give, and/or can be studied over time. The method offers researchers and hotel managers a useful new tool, which can guide quality improvement efforts and help focus marketing communication. In this paper the development of the approach is described, and a short example is presented where the method is applied on a single hotel.

Keywords Service quality · HOLSERV · TripAdvisor · Consumer-generated content

1 Introduction

Imagine that you are a hotel manager, and you care about your customers. You actively collect and read feedback forms, and each year you perform a service quality survey. But you wonder: with so many people leaving reviews of my hotel

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on websites such as TripAdvisor, do I really still need these surveys? You go online and check your hotel's rating: Your 4-star rating is higher than many other hotels in your area, but that doesn't tell you much. You start reading the reviews. The first says they liked the location and the restaurant, the second mentioned the cleanliness of the room, and the third thought the reception staff were unfriendly. Then you notice that there are 1,649 reviews and that you cannot possibly process all that information. Surely there must be a more efficient way to use online consumer reviews to measure service quality.

The method proposed in this paper does just that: measure service quality from reviews that consumers leave on sites such as TripAdvisor. It offers hotel managers a way to make sense out of online reviews, and it gives researchers a useful tool to study customer feedback and perceived service quality. The principle behind the method is to apply the dimensions of service quality (from for example the SERVQUAL scale) to online consumer reviews. This is done by comparing word frequencies in these reviews with a predetermined word list for each dimension, and clustering the data based on rating, to determine which dimension is mentioned most for high ratings vs. low ratings. Although the method is not meant to replace service quality surveys, it offers hotel managers a second source of information that is easy and potentially cheaper to obtain.

This paper's research question is therefore: Is it possible to apply a service quality scale to online consumer reviews, and obtain a score for different service quality dimensions? Three studies were conducted in sequence: the first to assess a number of different scales for their usefulness; the second to test whether it is possible to assign one or more dimensions to comments based on words that reviewers use; and the third to determine the complete word list for each dimension. Finally, to demonstrate the usefulness of the method, it was applied to 500 consumer comments of a hotel in Dublin, Ireland.

The importance of consumer reviews has been acknowledged widely, and researchers are aware of the necessity for companies to monitor and manage their online reputation (e.g. O'Connor 2010; Ye et al. 2009; Zhang et al. 2010). However, as far as the authors are aware no research has linked online reviews with service quality. This paper aims to fill this gap by offering a systematic and practical way for hospitality organizations and researchers to learn from consumer feedback. Online consumer reviews have the potential to provide a wealth of information about consumers' attitudes and how they prioritize different elements of service quality, which can be assessed for individual hotels as well as to compare different locations, user ratings or classification levels (stars).

The paper starts with a discussion of the theory regarding online consumer reviews, and of service quality measurement. Next, the methodology of the three studies is explained, and the results of each are summarized. Finally, in the discussion section the findings from the three studies are combined, the proposed methodology is described in detail, and an example is shown where the methodology is applied to a single hotel.

2 Theory

2.1 Online Word-of-Mouth and TripAdvisor

The importance of word-of-mouth for marketers has been widely supported in academic research (Richins 1983; Haywood 1989; Herr et al. 1991; Anderson 1998; Harrison-Walker 2001). So has the impact that online word-of-mouth platforms have had on how consumers share their positive and negative experiences (Dellarocas 2003; Hennig-Thurau et al. 2004; Trusov et al. 2009).

The relevance of electronic word-of-mouth has also been acknowledged by researchers in hospitality management. For example, Litvin et al. (2008) suggest that word-of-mouth is particularly important in hospitality because of the intangibility of its products, and their research showed that managing word-of-mouth is relatively cost-effective. Zhang et al. (2010) found that online reviews have a direct effect on the popularity of restaurants, while Vermeulen and Seegers (2009) drew the similar conclusion for hotels: positive reviews can increase awareness and improve consumers' attitudes. Finally, Ye et al. (2009) found a significant relationship between hotels' online ratings and their business performance.

TripAdvisor, part of e-commerce company Expedia and the subject of the studies described in this paper, is the largest online network of travel consumers (O'Connor 2010). Its primary purpose is to collect and disseminate user generated content (such as review, ratings and photos) about hospitality companies such as restaurants and hotels (O'Connor 2008).

2.2 Measuring Service Quality

Although service quality no longer gets as much attention from researchers as one or two decades ago, its importance cannot be overstated. It is strongly linked with word-of-mouth and customer satisfaction, and indirectly with purchase intention and customer loyalty (Cronin and Taylor 1992; Harrison-Walker 2001; Sureshchandar et al. 2002). Research by Chang and Chen (1998) indicates that service quality is an important antecedent to business profitability. Most of the research conducted regarding service quality was conducted in the 1990s and early 2000s, and resulted in a large number of conceptual models and measurement instruments (see Seth et al. 2005).

Service quality is often defined as an attitude; the perceived difference (or *gap*) between expectation and performance (Parasuraman et al. 1985; Seth et al. 2005). Its most popular measurement scale is SERVQUAL (Parasuraman et al. 1988, 2004), which is based on the premise that service quality consists of five dimensions: *tangibles*, *reliability*, *responsiveness*, *assurance* and *empathy*. Although SERVQUAL is not without criticism because of both conceptual and methodological concerns (Carman 1990; Babakus and Boller 1992; Buttle 1996), it is the

most commonly used scale for service quality and it therefore seems appropriate to consider it as one of our options to divide TripAdvisor comments into different service quality dimensions.

SERVQUAL has also been used in research that focused on the hospitality industry, with varying results. Saleh and Ryan (1991) applied SERQUAL successfully in a study of consumers' perception of service quality in hotels, and Akbaba (2006) confirmed that there were five dimensions but found a different factor structure. A number of researchers developed adapted measurement scales, including HOLSERV (Mei et al. 1999) and LODGSERV (Knutson et al. 1990) for hotels and DINESERV (Stevens et al. 1995) for restaurants.

3 Methodology

To develop the method three studies were performed in sequence. The purpose of the first study was to select the service quality scale that would be appropriate, i.e. whose dimensions are most distinctive and meaningful when they are applied to consumer reviews. To test the scales three researchers separately tried to assign the dimensions to 48 TripAdvisor comments that had been selected randomly (from 12 different hotels in 4 different English-speaking locations). Afterwards the results from different researchers were compared and discussed to select the appropriate scale to continue with. The second study was very similar to the first, as again the three researchers categorized the same 48 comments along the dimensions of the chosen scale. However, this time the purpose was to explore which words in the reviews were representative of each dimension.

The third study was different: a large database was used of over 10,000 TripAdvisor comments for 90 hotels in Northern Italy, which was available from another (unpublished) study. The comments were analyzed using RapidMiner, an open-source data mining program (Rapid-I 2013). First, with RapidMiner the words of all comments were ranked based on their overall frequency (or total word count). Next, each of the three researchers assigned each of these top-1000 words to a dimension. Words that were irrelevant were ignored, and words that were ambiguous were isolated for later discussion.

4 Results

4.1 Study 1—Selecting the Service Quality Scale

Two scales were selected as starting points: SERVQUAL and HOLSERV. SERVQUAL has five dimensions (*tangibles*, *reliability*, *responsiveness*, *assurance* and *empathy*), while HOLSERV has a significantly different structure with the

Table 1 (a) SERVQUAL dimensions, (b) HOLSERV dimensions

Dimension	Description
a	
Tangibles	Physical facilities, equipment, and appearance of personnel
Reliability	Ability to perform the promised service dependably and accurately
Responsiveness	Willingness to help customers and provide prompt service
Assurance	Knowledge and courtesy of employees and their ability to inspire trust and confidence
Empathy	Caring, individualized attention the firm provides its customers
b	
Employees	Prompt service, willingness to help, confident in delivery of service, polite, knowledgeable, skillful, caring, understanding, sincere, neat and professional employees
Tangibles	Modern-looking equipment, fixtures and fittings, appealing facilities and materials, comfort, cleanliness, user-friendly equipment and facilities, variety in food and beverages, operation of services at a convenient time
Reliability	Keeping promises, accurate and timely service, safe and secure stay

three dimensions: *employees* (which includes both behaviour and appearance), *tangibles* and *reliability*. The dimensions for both scales are shown in Table 1, with descriptions as they can be found in the original papers by Parasaruman et al. (1988) and Mei et al. (1999). LODGSERV and the altered five-dimensional scale by Akbaba (2006) were also considered but are very similar to SERVQUAL and were therefore not studied. Although the analysis was performed for 48 comments, for this discussion the two comments that are shown in Table 2 will be used as examples. The table also shows the dimensions that each researcher assigned to the comments, before the results were discussed.

It is immediately apparent from the table that the researchers categorized the comments quite differently, and therefore the results had to be discussed in detail. Regarding SERVQUAL, the researchers found that even during the discussion they could not reach a common understanding how comments should be scored. The SERVQUAL instrument relies on exact phrasing of survey questions to make a distinction between its dimensions, but consumers who leave their review on a website are not as accurate. For example, in comment 2 the phrases 'the service [was] of the highest standard' and 'we greatly appreciated the special treatment' are unclear, and a case could be made to assign them to any of the following dimensions: *reliability*, *responsiveness*, *assurance* and *empathy*. The only dimension that was entirely clear was *tangibles*.

The way comments were categorized using HOLSERV was much more consistent, and it was fairly easy to find common ground when the results were discussed. Here also the dimension *tangibles* was entirely clear; as soon as words like 'breakfast' or 'shower' were found this dimension was identified. There was some debate about the distinction between *employees* and *reliability*, and it was therefore agreed that clearly distinctive definitions were required.

Table 2 Sample of results from study 1

#	Comment	Reviewer	SERVQUAL					HOLSERV		
			T	R	R	A	E	E	T	R
1.	We had an extremely satisfying time here, and would certainly stay again. It ticked all the boxes, and delivered everything you expect from a central London hotel of this price range, and then some. Breakfast was a particular highlight, and one which we eagerly anticipate in the future	A	X						X	
		B	X	X					X	X
		C	X	X			X		X	X
2.	We would like to thank [owner and staff] who looked after us so well on our recent trip back to the [hotel] restaurant. Both the food and the service were of the highest standard and we greatly appreciated the special treatment, which is synonymous with [hotel]! We can't wait to return for another stay and sample the delicious food and superb surroundings. Many thanks again!	A	X		X		X	X	X	X
		B	X	X	X	X		X	X	X
		C	X		X	X	X	X	X	X

Table 3 HOLSERV Plus dimensions

Dimension	Description
Room	Equipment, fixtures and fittings in the hotel room, services available in the room. Cleanliness and user-friendliness
Facilities	Facilities and services available in the hotel (outside the room). Breakfast, restaurants and bars, pool and fitness/spa facilities
Surroundings	Location of the hotel, proximity to amenities, public transport and attractions
Employees	General appearance and behavior of staff. Promptness, politeness, understanding, neatness
Reliability	The willingness of staff to help guests in specific situations. The way they handle requests and complaints

This study made it apparent that HOLSERV is a much better instrument for our purpose than SERVQUAL, because the three dimensions are much more distinctive. The ambiguity between *employees* and *reliability* was fixed as follows: comments that referred to the staff and the service in a general way were assigned to *employees*, while *reliability* referred to specific problems or actions where the staff made extra effort to help their guests. This distinction was again tested on the 48 comments, and led to consist scores between researchers.

Another conclusion was drawn from this study: the range of subjects covered by *tangibles* is very wide, possibly too much so. Nearly all comments (47 out of 48) mentioned *tangibles*. It includes things that are within a hotel manager's immediate control, such as breakfast and cleanliness, but it can also refer to the style of the building and the hotel's location. Therefore the decision was made to test an adapted version of the HOLSERV scale in which the dimension *tangibles* was broken down into three others: *room*, *facilities* and *surroundings*. The researchers found that scoring along these dimensions was simple because they are very distinctive, and that it made the results more meaningful. Therefore this adapted scale was used for consecutive studies, and it will be referred to as HOLSERV *Plus*, with the dimensions *room*, *facilities*, *surroundings*, *employees* and *reliability*. Table 3 shows a definition of each dimension.

4.2 Study 2—Exploratory Selection of Key Words

After the scale was selected, the next step was to test whether it is possible to score comments based on the chosen dimensions, and to identify which words in the comments are important when dimensions are assigned. Table 4 shows the results for the same sample comments that were used earlier. In comment 1 the word 'breakfast' was the only one that was specific to a particular dimension, namely *facilities*. In comment 2 several words were found that allowed dimensions to be assigned to it: 'food' related to *facilities*, 'surroundings' to *surroundings*, 'service' to *employees* and 'special treatment' to *reliability*.

Table 4 Sample of results from study 2

#	Comment	HOLSERV Plus	
1.	We had an extremely satisfying here, and would certainly stay again. It ticked all the boxes, and delivered everything you expect from a central London hotel of this price range, and then some. Breakfast was a particular highlight, and one which we eagerly anticipate in the future	Room Facilities Surroundings Employees Reliability	Breakfast
2.	We would like to thank [owner and staff] who looked after us so well on our recent trip back. Both the food and the service were of the highest standard and we greatly appreciated the special treatment, which is synonymous with [hotel]! We can't wait to return for another stay and sample the delicious food and superb surroundings. Many thanks again!	Room Facilities Surroundings Employees Reliability	Food Surroundings Service Special treatment

The three researchers scored the comments quite consistently, and in most cases reached an agreement quite easily when the differences were discussed.

However, it was evident from this study that for many words it is ambiguous to which dimension it belongs. For example, the words 'comfortable' and 'clean' can relate to the room but also to the hotel as a whole, and the word 'course' can be related to the restaurant (the dimension *facilities*), but can also be from the general expression 'of course'. In these cases the word was looked up in multiple comments to see how it was most commonly used (in these particular cases leading to 'comfortable' and 'clean' being assigned to *room*, and 'course' to *facilities*). In some cases a deeper discussion was necessary; for example the word 'noisy' normally related to noise outside the hotel, but researchers agreed that although it is dependent on the hotel's location (i.e. *surroundings*), hotel managers have influence over the noise level, e.g. by installing double glazing or closing a terrace early, so it was added to the dimension *facilities*.

Study 2 gave researchers sufficient confidence that a definitive list for each dimension could be created, and therefore the next study was conducted.

4.3 Study 3—Creation of Word List

This study was performed with a large word frequency list generated from TripAdvisor comments for hotels in Northern Italy, which was available from another (unpublished) study. The top-1000 words of this list were each assigned to a specific dimension; those that could not be assigned would either be labelled ambiguous (for further discussion) or unclassified (no discussion necessary).

Although RapidMiner removes stop words, many words in the top-1000 were irrelevant. Only 241 words were considered for the dimensions, out of which 44 were too ambiguous to allocate (e.g. water, park, and entertainment could refer to different dimensions). The remaining 197 words were assigned to the dimensions

Table 5 Results of study 3

Dimension	Words	10 highest-frequency words
Room	46	Room(s), clean, balcony, comfortable, bathroom, shower, bed, towels, spacious, (air) conditioning
Facilities	63	Food, breakfast, pool, view(s), restaurant, dinner, meal, buffet, buffet, terrace
Surroundings	54	Lake, Garda, location, walk, town, area, road, centre, local, shops
Employees	21	Staff, friendly, service, helpful, reception, welcome, welcoming, attentive, polite, rude
Reliability	13	Problem(s), manager, trouble, fault, complaint(s), requested, management, owner(s), issue, complained

as shown in Table 5; the 10 highest-ranking words for each dimension are also shown.

Although this analysis resulted in five word lists that seem to satisfy our needs, a number of things were found that need closer scrutiny. First, the number of words per dimension varies greatly, from 63 for the dimension *facilities* to 13 for *reliability*. This is not a problem in itself, but it does need to be considered when results are presented. In particular, results will need to be presented as indices or percentages rather than total word counts to make comparison between the dimensions possible. Second, the two highest-frequency words for the dimension *surroundings* are Lake and Garda, because the hotels in the database are located at the Garda Lake. Obviously this same word list cannot be used for hotels at another location, so either a generic list should be used (which means that location-specific information will be lost) or a list should be created for each hotel or region individually (which reduces consistency between studies). Finally, the number of words in the dimension *reliability* is very low and they are very similar in meaning, which indicates that this dimension may not offer very rich data to researchers. This causes some concern, and should be a focus point during further application and testing of the dimension word lists.

5 Discussion

Based on the three studies, the conclusion was drawn that, although there are a number of concerns that need to be addressed, the method should offer researchers and hotel managers a useful tool to measure service quality. The five dimensions that were created are distinctive and meaningful, and when the method is applied to individual hotels it should help managers to focus quality improvement efforts on the right issues.

5.1 Reliability and Validity

Although the initial studies were performed by hand, the idea is that this method will ultimately be performed by a computer algorithm; an Internet crawler can copy the comments from the website, the program can perform a word frequency count, and it can use the standard word list to assign comments to specific dimensions. Although the researcher will have to monitor and interpret the results, reliability (i.e. consistency) should not be a major concern.

Validity is a more challenging criterion. The method seems to have face validity, since it is based on the HOLSERV instrument and its dimensions are straightforward and logical, but more research (e.g. comparison with survey results) is necessary to prove a higher level of validity.

5.2 An Example: Best Western Plus Academy Hotel, Dublin

In this example the method was used for a specific hotel to test how easily it could be applied and how informative it is for researchers and managers. The hotel that was chosen is the *Best Western Plus Academy Plaza Hotel* in Dublin because it is near the ENTER conference location.

Only the 500 most recent comments (out of 1,649) were used, which were written between 19 February 2012 and 25 June 2013. The comments were copied manually from TripAdvisor to Excel. The data mining program RapidMiner was used to calculate word frequencies, both overall and for each rating level (1 to 5 stars). The words were then assigned to a dimension based on the lists from study 3, and the word frequencies for each dimension were summed. Table 6 shows the indices for each rating level and each dimension versus the average for all ratings together. The 1-star and 2-star ratings are grouped together because of the low number of comments for these levels (9 and 16 respectively). Following this, the word frequency lists (not shown) were inspected to understand the reason behind noticeably high or low indices.

It is apparent from the table that reviewers who gave the hotel a 1, 2 and 3-star rating talked a lot about the *room*, and the frequency list showed that they used the words ‘tiny’ and ‘small’ much more than average. In particular those who gave a 1 or 2-star rating focused a lot on *reliability* and *employees*, indicating that they were unhappy with the service. The words ‘manager’ and ‘person’ were high up in their word list which suggests that they had particular issues that were not resolved to their satisfaction. Although these low-rating reviewers focused less on the hotel’s *facilities*, the words ‘parking’ and ‘lobby’ were high on their lists, indicating that these could be areas of improvement. In contrast, consumers who gave a 4-star rating seemed particularly pleased with the location of the hotel (*surroundings*). Perhaps surprisingly, those who left a 5-star rating focused less on *surroundings* but much more on *employees*, using words such as ‘friendly’, ‘helpful’ and ‘efficient’.

Table 6 Service quality indices for Best Western Plaza, Dublin

Rating	Reviews	HOLSERV Plus dimensions—index vs. average across ratings				
		Room	Facilities	Surroundings	Employees	Reliability
1 + 2 stars	25	141	103	54	129	196
3 stars	77	129	103	89	105	84
4 stars	231	98	111	112	90	100
5 stars	167	83	83	96	107	93

It can be concluded that even a rudimentary analysis of a hotel's service quality based on TripAdvisor reviews can offer information that is helpful to managers. In this shown example the results could be used to guide quality improvement efforts and to determine which message the hotel should focus on in its marketing communication.

6 Conclusion

This paper proposes a new method to measure service quality from online consumer reviews and ratings. The essence of this method is that a word frequency analysis is performed with comments that are collected from websites such as TripAdvisor, and these comments are then assigned to particular service quality dimensions. The dimensions are based on the HOLSERV scale (Mei et al. 1999), but were adapted to allow distinction between different tangibles. The five resulting dimensions are: *room*, *facilities*, *surroundings*, *employees* and *reliability*.

In the studies and the example it was shown that, if applied properly, the method offers hotel managers useful information that can be used to identify quality improvement points and to guide communication strategy. The index scores provide insight in what consumers who write reviews focus on, both for low and high ratings. The word frequency list then offers additional depth to understand consumers' reasoning. How often the method can be used to measure service quality depends on the number of reviews that are available on TripAdvisor, which varies per hotel. A superficial assessment of TripAdvisor shows that hotels receive between 50 and 500 reviews per year, so an annual survey seems manageable for most.

In addition to its usefulness to managers, the proposed methodology provides academic researchers with a new way to assess how consumers prioritize different dimensions of service quality in online reviews, and offers the opportunity to identify differences based on for example geographical location or price category.

A number of limitations need to be acknowledged. Although the results presented in this paper are promising, the method will need to be applied and tested a number of times in different settings to show how robust it is and to learn how the information that it offers can be used to guide strategic planning. Although the

standardized word lists and automated word frequency counts make the method reliable, future research should address possible validity concerns. Additionally, the proposed methodology used keywords to categorize comments into dimensions, but made no distinction between positive and negative words (e.g. 'clean' vs. 'dirty'). We suggest that the reviewer's rating (from one to five) allows us to assess whether the experience was positive or negative, but it is possible that refinement of the methodology will be necessary in the near future.

Future research could address a number of these shortcomings, for example by evaluating validity in different contexts (e.g. city vs. resort, business vs. tourism), or comparing results with those of service quality surveys. The methodology offers a range of potential applications, for example by looking at particular regions or hotel types. Finally, variants for this methodology could be developed for different industries, such as restaurants and other service providers.

Nevertheless, the method seems to offer researchers and hotel managers an efficient new tool. Although it should not replace regular service quality surveys, this method can be used in tandem. The analysis is fast and easy to carry out, and may offer hotel managers who don't have the budget or knowledge to perform a survey an alternative approach.

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Online Review Contents and Their Impact on Three and Four-Star Hotel Reservations: Some Evidence in Italy

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Abstract Scholars and practitioners in the tourism sector seem to agree that web reputation affects hotel operational performance. This study addresses this issue by analysing the online review contents of 40 (20 four-star and 20 three-star) hotels in the Province of Rimini (Italy). In particular, it questions if and to what extent the positive/negative sense of TripAdvisor reviews influences the online reservations of the hotels considered. The content analysis performed on hotels suggests that traditional core services (like room and interaction with staff) represent key factors in determining customer appreciations and criticism. Panel data analysis, of the same hotels, seems to suggest the presence, to some extent, of a linear relationship between operational hotel performance and online reputation.

Keywords Digital reputation · Web reviews · Hotel performance · Content analysis

1 Introduction

Travel and tourism products are the third and fifth most desired commodities, respectively, that people plan to buy online in the near future and are among the top five most purchased product groups via the Internet (Eyefortravel 2012).

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According to Burger et al. (1997), travel and tourism products have characteristics that make them well-designed for the Internet market: high price, high involvement, intangibility, high risk and heterogeneity. The Internet helps travellers obtain more information, compare prices, find discounts and share their travel experiences (Litvin et al. 2008; Sigala et al. 2001). User-generated comments (UGC) have a significant influence in the travellers' decision making process (Sweeney et al. 2008). Managing a hotel's online reputation (Fombrun et al. 1999; Dowling 2001; Solve 2007; Marchiori and Cantoni 2011) is particularly relevant in touristic places with a massive amount of arrivals and a high number of competing hotels, such as the Province of Rimini. In this location, there is a high level of competition and more than 58,015 rooms available. Hotels in the same category offer similar services and the same price, making it hard for travellers to choose a hotel. In such situations, travellers use the content polarization (positive or negative) of online comments as a driver to book a hotel.

The aim of this empirical study is to analyse online comments posted on TripAdvisor and use them as drivers of hotel web reputation and then understand how their web reputation could affect the operational performances of a sample of hotels. The sample includes a group of 40 (20 four-star and 20 three-star) hotels located in the Province of Rimini. For each hotel, authors could rely on available data in relation to operational performance (e.g. room sold, price paid, length of stay),[1] while reviews posted on TripAdvisor were analysed using the content analysis technique. Empirical results highlight the most significant positive and negative items included in web reviews, helping hotel managers understand which aspects customers rate as important. Moreover, the article provides a methodological contribution to tourism research in terms of understanding cases wherein TripAdvisor reviews affect hotel booking by verifying the presence of a relation between hotel reputation and their occupancy rates, as a determinant of economic performance. In short, the research questions for this paper are: to identify positive and negative aspects included in hotel web reviews (RQ1) and to verify the existence of a functional (linear) relationship between online reputation and operational hotel performance (RQ2). The paper proceeds as follows: in Sect. 2, the authors present an overview of previous studies. Content analysis and panel data analysis are presented respectively in Sects. 3 and 4. Section 5 outlines the main findings and a discussion of the limitations of this study.

2 Research Background

The latest stage of the Web, Web 2.0, is more interactive and social than the previous version, enabling people to connect and share experiences, and not only information (O'Reilly 2007). Web 2.0 sites are user-centric, collaborative and

[1] Data was provided anonymously by Teamwork, a private company established in Rimini which has been operating for over 15 years supporting more than 1,000 Italian hotels.

inclusive (Dearstyne 2007). The ability to express personal ideas, beliefs, opinions and comments on web pages, also called electronic word of mouth, or "e-wom" (Cheung et al. 2009; Dwyer 2007; Dellarocas 2003), primarily affects e-commerce (Ahuja et al. 2007), where consumers tend to require more useful information from UGCs than from official commercial sources (Litvin et al. 2008). As Xiang and Gretzel (2010) highlight, "e-wom" will challenge the established marketing practise of many tourism businesses and destinations. A relevant number of studies has emphasized the importance of UGCs for the hotel industry. O'Connor (2010) examined the level of importance for hotels to track online reviews. Litvin et al. (2008) noted that UGCs are an essential source of strategic advice that hotels can use to develop a number of business strategies. O'Connor and Frew (2002) suggested that online reviews are an opportunity for hotel managers, and they must develop this communication channel if they want to improve their hotel's digital reputation. Krempl (2007) argued that by using social media as a distribution channel and not as a marketing and information dissemination platform, it is possible to achieve a high click-through rate up to 20 %, or 30 % in the case of TripAdvisor. On the one hand, there are several studies focusing on understanding which hotel characteristics or services guests rate as important. For example, Stringam and Gerdes (2010) found that room and service were the categories on which guests pay most attention in their reviews. Similar results have been confirmed by Chaves et al. (2012). Sparks and Browning (2011) noted that the quality of guest interaction with employees is essential in influencing trust perceptions of the hotel. Also, studies focusing on hotel online images highlight the same features as relevant (Zhang and Mao 2012). On the other hand, there are studies that went beyond this by trying to investigate how positive or negative reviews could impact on hotel performance. Ye et al. (2011), for example, found that a 10 % increase in reviewer ratings can increase sales by 4.4 % and a 10 % decrease could reduce hotel sales by 2.8 %. Vermeulen and Seegers (2009) showed the same findings: positive reviews have a large impact on consumer behaviour while negative reviews have a negligible impact. While Papthanassis and Knolle (2011) offered a different conclusion: negative reviews have more influence than positive reviews because the reader judges them as more credible. Clemons and Gao (2008) observed that negative reviews highlight more clearly than positive ones that prospective customers might not receive the desirable service quality level. However, most of the previous studies that attempted to link online reviews with hotel performance suffer the unavailability of detailed booking information. For example, Ye et al. (2011) used the numbers of published reviews on Ctrip as a proxy of hotel online bookings. Moreover, studies with actual booking data have measured web reputation in terms of popularity index and scores on major booking portals without taking into account the content of web reviews (Tuominen 2011; Anderson 2012).

3 Content Analysis

This study focuses on a sample of 20 four-star and 20 three-star hotels located in the Province of Rimini (a famous vacation spot in the Centre of Italy, on the Adriatic coast). A total of 4,335 reviews posted in Italian on the TripAdvisor website were analysed (all available reviews from January 2011 to April 2013). The study focuses on TripAdvisor because it represents the most influential social network (and blog) for travel tips worldwide (Jeong and Jeon 2008; Levy et al. 2013; O'Connor 2010; Touminen 2011; Zheng et al. 2009) as well as in Italy. Reviews were organised on a monthly basis as it helps identify the existence of seasonality (i.e. probable peaks during summer vacations). Considering the whole period under examination, selected hotels recorded and average of 3.9 reviews per month. Variability is high: reviews of a specific hotel could range from a minimum of zero to a maximum of 39 reviews per month. Moreover, data indicate an increasing tendency to post comments online (from 1.3 reviews per month on average in January 2011 to 6 reviews in April 2013).

First, authors analysed reviews by applying the content analysis technique (Weber 1984; Krippendorff 2004), which helps codify data into categories (or codes) thus facilitating the identification of elements rated by hotel guests as important and of services affecting hotel reputation. Second, codes frequency was used to evaluate the impact of positive and negative reviews on hotel performance (measured with the number of rooms booked by Italian customers through the internet channel). The Atlas.ti software was used to perform content analysis, while regressions were calculated with R (a language and environment for statistical computing).

Categories were initially derived from existing tourism literature following a deductive approach (see works cited by Sparks and Browning 2011). Then authors adjusted them (renamed, deleted or added) during the reading process, following the conventional inductive approach to content analysis which leads to defining a set of analytical categories grounded in the data (Hsieh and Shannon 2005). Authors stopped the iterative process of coding when they found that they were not learning anything new about the topic. Table 1 describes the codes, most of which can be grouped into four main families that summarise key aspects that prospective customers are expected to consider when deciding to book a hotel,[2] as listed below:

- 'Core services' such as rooms, bathroom, the building and hotel location.
- 'Facilities' including hotel sections that improve customer experience, e.g. the pool and spa area, business centre, sport facilities, parking and lobby.

[2] Grouping codes into families is useful for potential comparisons with previous studies which usually categorise reviews into two main dimensions: 'core hotel features' and 'service staff', or distinguish between tangible features and interactions with personnel (Sparks and Browning 2010).

Table 1 Code list and meaning of codes

Codes	Meaning and examples
Location	Information on the ease of reaching the hotel and its location
Building	Information on hotel decor and building appearance
Room	Information about the room size, its lightening, furnishing, cleanliness
Bathroom	Information about bathroom size, furnishing, cleanliness, accessorizes, etc.
Lobby	Information about the physical characteristics of the entrance hall
Business centre	Information about conference rooms, computers and printers for guests
Pool & spa	Information about the pool, solarium, wellness centre
Sport facilities	Information about gym and other sport equipments
Parking	Information about location and physical characteristics of parking lot
Food	General food-related information such as regarding lunch and breakfast
Internet	Information about WI-FI in rooms and lobby
Staff at reception	Information about hotel personnel at the reception desk
Staff at other locations	Information about the hotel staff in other areas of the hotel
Price	Ratio between quality and price paid
Title	Brief information provided in the heading of the customer's review
Reply	Reply of hotel managers or owners to customers' reviews

- 'Side services', which customers may or may not experience (depending on the type of stay), such as food and internet.
- 'Personnel', which entails interaction with the hotel staff.

Each code has been split into positive and negative values. Neutral comments were not considered because reviews are usually written by customers who had a significantly positive or negative experience (Sparks and Browning 2011) and they were very rare in the hotel reviews considered. Some impartial comments (like 'average hotel) appear only in the heading of TripAdvisor reviews. A specific code, named 'title', was created to describe headings because their position (on top) and textual characteristics (bold, bigger and in a different colour) may attract readers' attention, and thus become important in influencing customer evaluations. Considering that people tend to take short-cuts when making decisions (Fiske 1993; Sparks and Browning 2011), it can be assumed that customers do not read all information provided in long reviews but no one will skip reading the title.

To ensure inter-coder reliability, the two coders performing content analysis established common rules to define the size of text segments (quotations) attributable to codes. In this study, a quotation is defined as any segment of reported sentences comprising mainly of at least a subject and a verb. However, as internet language is short and informal, coders also included sentences with a subject and an adjective (e.g. 'very large room') or omitted but clearly identifiable subjects. Coders used a sample text for a pilot test of inter-coder reliability. Disagreements about codes and quotations were solved through discussions or the use of a third

Table 2 Most frequent codes for three and four-star hotels

	Quotation count			Word count			Average length
Room NEG	1,155	3,934	17.3 %	17,751	48,143	19.0 %	15.37
Room POS	2,779			30,392			10.94
Staff at other locations NEG	262	4,243	18.7 %	5,770	49,184	19.4 %	22.02
Staff at other locations POS	3,981			43,414			10.91
Staff at reception NEG	283	3,950	17.4 %	7,087	45,358	17.9 %	25.04
Staff at reception POS	3,667			38,271			10.44
Food NEG	382	3,599	15.8 %	6,346	41,300	16.3 %	16.61
Food POS	3,217			34,954			10.87
Location NEG	84	1,837	8.1 %	968	19,082	7.5 %	11.52
Location POS	1,753			18,114			10.33
Pool&spa NEG	320	1,475	6.5 %	4,227	17,785	7.0 %	13.21
Pool&spa POS	1,155			13,558			11.74
Building NEG	136	1,107	4.9 %	1,600	8,473	3.3 %	11.76
Building POS	971			6,873			7.65
Bathroom NEG	386	824	3.6 %	4,996	8,723	3.4 %	12.94
Bathroom POS	438			3,277			10.59
Price NEG	164	721	3.2 %	1,831	5,805	2.3 %	11.16
Price POS	557			3,974			7.13
Parking NEG	169	589	2.6 %	2,413	5,625	2.2 %	14.28
Parking POS	420			3,212			7.65
TOTAL	22,721		100 %	253,936		100 %	11.18

(*) Codes with a frequency lower than 2 % are not here displayed

researcher who served as a tie-breaker. In addition, indexes for reliability levels were calculated for the most recurrent variables (staff, room, bathroom and food). As Miles and Huberman (1994) recommend that coders achieve an inter-rather reliability rate of above 80 %, the coders met to refine the coding rules and calculations were subsequently run until they achieved an acceptable level of inter-coder reliability.

Data (Table 2) indicate that staff, room and food are the most important items receiving either positive (POS) or negative (NEG) comments. A second group of tangible elements which have moderate relevance for customers choosing the touristic area under examination consists of location and pool and spa. Surprisingly, issues regarding bathroom are not so important, indicating that this core service is either "average" or irrelevant for customers choosing this location. Internet access, availability of sport facilities and lobby features are also not important, for neither three nor four-star hotels. In general, differences between the two hotel categories are limited. Only interactions with staff receive more comments in three-star hotels.

Data indicate that complaints represent only a minority of comments (85 % of quotations identified refer to positive items while only 15 % of 22,721 quotations describe negative aspects). Also with reference to heading content, the sample is

characterized by a high frequency of positive titles. 87 % of total sentences classified into codes refer to a positive experience, while only 12 % are negative titles and the remaining 2 % are attributable to neutral opinions.

4 Online Reputation and Operational Hotel Performance: A Panel Data Analysis

After having described content analysis results (Sect. 3), in order to answer RQ2 it is necessary to explore whether and to what extent web reputation affects the operational performance of the hotels analysed. For this purpose, the online reservations related to each hotel during the period 1 March 2011–30 April 2013 were analysed against their reputational data. In this paper, the unobserved factors affecting the operational hotel performance are of two types: those that are constant and those that vary over time. A number of models connecting the online reservations of each hotel in any time period with its contemporary web reputation level could be written. Letting i denote the cross-sectional unit (hotel) and t the time period (two-months), we propose two different models; both of them consider online reservations (*res*) as the dependent variable regressing it on web reputation (exclusively in terms of the positive/negative sense of TripAdvisor reviews). On the one hand (1), web reputation was measured by the total number of positive and negative comments (*posrev* and *negrev*) forming the reviews analysed. On the other hand (2), review titles (either positive and negative) were used as explanatory variables:

$$log(res_{it}) = \delta_1 + \sum_{j=2}^{13} \delta_j dj_t + \beta_1 negrev_{it} + \beta_2 posrev_{it} + a_i + u_{it} \quad (1)$$

$$log(res_{it}) = \delta_1 + \sum_{j=2}^{13} \delta_j dj_t + \beta_1 negtitle_{it} + \beta_2 postitle_{it} + a_i + u_{it} \quad (2)$$

In each model the variable captures all unobserved, time-constant factors that affect online reservations. Technically speaking, it is an unobserved hotel-effect which represents all factors affecting online reservations that do not change over time. It is possible to eliminate a_i by differencing adjacent periods, obtaining models (1.1) and (2.1):

$$\Delta log(res_{it}) = \sum_{j=2}^{13} \delta_j \Delta dj_t + \beta_1 \Delta negrev_{it} + \beta_2 \Delta posrev_{it} + \Delta u_{it} \quad (1.1)$$

$$\Delta log(res_{it}) = \sum_{j=2}^{13} \delta_j \Delta dj_t + \beta_1 \Delta negtitle_{it} + \beta_2 \Delta postitle_{it} + \Delta u_{it} \quad (2.1)$$

Table 3 Panel data analysis summary

			Three-star hotels		Four-star hotels	
Online reputation measured by review meanings	*Δnegrev*	Coeff. Est.	−0.0014		0.0053	
		Std.err,	0.0045		0.0050	
		p-value	0.7547		0.2882	
	Δposrev	Coeff. Est.	0.0021	**	−0.0001	
		Std.err,	0.0010		0.0015	
		p-value	0.0273		0.9448	
Online reputation measured by title review meanings	*Δnegtitle*	Coeff. Est.	−0.0427	**	0.0098	
		Std.err,	0.0239		0.0199	
		p-value	0.0755		0.6231	
	Δpostitle	Coeff. Est.	0.0095	*	0.0117	*
		Std.err,	0.0050		0.0070	
		p-value	0.0596		0.0956	

Significant codes: **0.05; *0.1

Equations (1.1) and (2.1) give unbiased estimators and usual t and F statistics are valid for hypothesis but they do not contain intercepts and they could cause some statistical problems (including for the computation of R-squared). This is the reason why the models (1.2) and (2.2), estimating the first-differenced equations with an intercept and a single time period dummy, were used for the analysis:

$$\Delta log(res_{it}) = \alpha_0 + \sum_{j=3}^{13} \alpha_j \Delta dj_t + \beta_1 \Delta negrev_{it} + \beta_2 \Delta posrev_{it} + \Delta u_{it} \qquad (1.2)$$

$$\Delta log(res_{it}) = \alpha_0 + \sum_{j=3}^{13} \alpha_j \Delta dj_t + \beta_1 \Delta negtitle_{it} + \beta_2 \Delta postitle_{it} + \Delta u_{it} \qquad (2.2)$$

Both equations consider the explained variable in a logarithmic form while the covariates are in their level form. In these log-level models, $100 \times \beta_i$ outlines the semi-elasticity of online reputation ($\Delta negrev$, $\Delta posrev$/$\Delta negtitle$, $\Delta postitle$) with respect to online reservation percentage change ($\Delta \log(res)$) for the ith hotel. Analysis by models (1.2) and (2.2) was performed either on three-star and four-star hotels; the results (coefficient estimates, standard errors and p-values) are shown in Table 3.

Some typical regression model diagnostics were performed in order to test for serial correlation and heteroskedasticity. The absence of serial correlation in the errors is deduced from the correlograms in Fig. 1; In order to test for heteroskedasticity, the Breusch-Pagan test was performed without rejecting the null hypothesis.

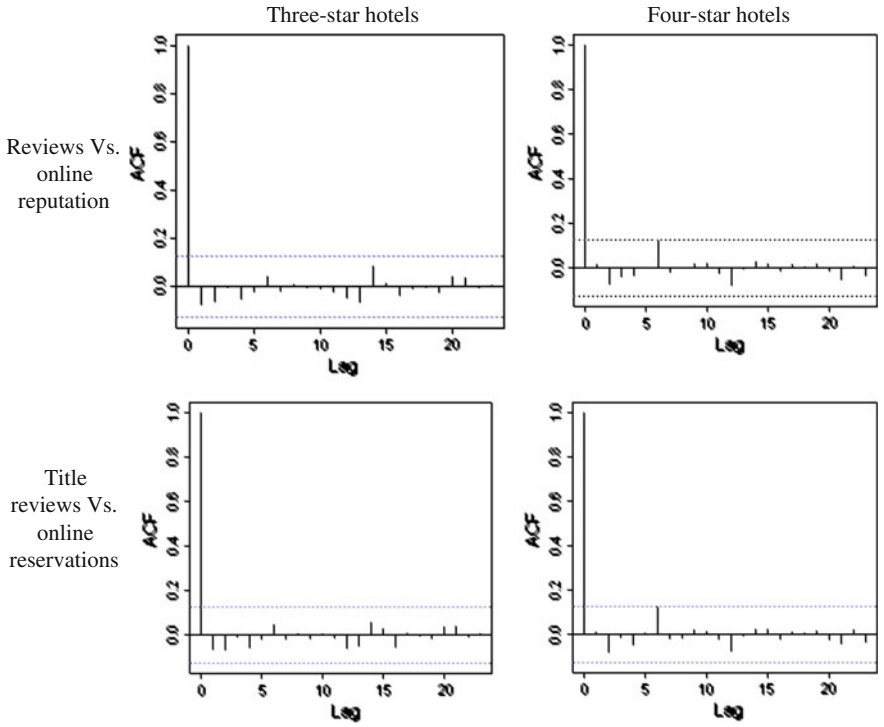

Fig. 1 Correlograms

5 Findings

5.1 Discussion on Content Analysis Findings

In relation to negative comments, results suggest that consumers are mainly dissatisfied with basic services (i.e. poor room quality and rude staff), which confirms what emerged from previous research (Del Chiappa and Dall'Aglio 2012; Lee and Hu 2005). At the same time, the average length of text segments assigned to negative codes is higher than the length of quotations referring to positive codes. This indicates that customers provide more detailed sentences and greater details to describe their negative experiences compared to positive ones. In other terms, the magnitude of negative experiences is higher, although these are limited in frequency.

By grouping concepts into the four identified families, results indicate that the total amount of comments about hotel personnel (customer expectations of friendliness, warmth and cheerfulness that have or have not been satisfied) is as important as the sum of all comments regarding the core service dimension. In line with the findings of Sparks and Browning (2010, 2011), Stringam and Gerdes

(2010) and Chaves et al. (2012), staff represents the category to which guests pay more attention, together with room. Moreover, the usage of very long sentences to describe interactions with hotel personnel reinforces the mainstream idea that staff cordiality represents a key and distinctive variable among Rimini hotel offerings (Rossini 2003).

The specific characteristics of the touristic area considered here (a vacation spot where hotel guests spend most of the day at the bathhouses, which are fully equipped with outdoor pools, gym, Internet access and other leisure areas) could be relevant in explaining the results. For example, these characteristics may affect the scarce attention devoted to the availability of Internet, business centres and sport facilities in the hotel reviews analysed.

5.2 Discussion on Panel Data Analysis Findings

Please Panel data analysis shows that, with reference to the sample considered, a linear relationship between operational hotel performance and online reputation seems to exist. In four-star hotels, this association connects the review titles with a positive meaning to online reservation percentage changes. Actually, only a weak connection is shown, either by magnitude (1.17 %) or by significance level (0.1). In relation to three-star hotels, both the review (only those with a positive sense) and the review titles seem to be connected to online reservation percentage changes. Although the significance level is again higher than 5 %, both positive review titles and negative ones show significant and consistent coefficients (−4 % with a p value of 0.08 and 0.1 % with a p-value of 0.06 for negative and positive review titles respectively). Finally, Table 3 outlines the stronger relationship between the positive meaning of reviews and online reservation percentage changes. Unlike the case of four-star hotels, in three-star ones a significant and consistent coefficient, only for the reviews with a positive sense, is shown (0.2 % with a p-value of 0.03).

This study suggests that online reputation is an important performance driver for the hotels analysed. Moreover, it is more important for three-star hotels than for four-star ones. Although this could be explained and argued in different ways, the authors believe that it depends on the great importance that people place on the hotel star classification in Italy. A four-star hotel is supposed to have reliable facilities and services in line with specific requirements established by local governmental authorities; thus potential customers do not need an in-depth web review analysis. In any case, recurring web reviews with a positive meaning can persuade undecided people to choose a certain four-star hotel. For three-star hotels the situation is different: most probably people do not consider facilities and services needed for that rating level, in the Italian hotel star classification system, to be adequate. Therefore, online reputation becomes a third-party tool by which to reduce the information asymmetry and the uncertainty level and comments become important for the decision making process.

5.3 Limitations and Future Research

Like other research of an exploratory nature, this study presents several limitations. It lacks comprehensiveness due to the limited number of hotels examined. Moreover it takes into account only hotels located in the Province of Rimini and focuses only on UGCs in the Italian language. In future analyses other travel review and information sites such as Venere.com, Expedia.com, Booking.com, etc. should be included to investigate the influence of UGCs on hotel reservations in a more comprehensive way. In addition, the analysis of UGCs from different web sites should reduce the impact of fake reviews which might affect open online traveller communities like TripAdvisor. Some studies have noted that hotels post fake negative comments to drag down the rating of their competitors or they create positive reviews to push their existing negative reviews lower. However, in this study, online comments do not conform to the criteria presented by Keates (2007) for the identification of fake reviews (i.e. extreme scores and a solitary visit by the reviewer who posts the comment). Future research should focus on different geographic areas, consider other types of hotels (e.g. suburban hotels, airport hotels, resorts) and explore customer characteristics. Extending the research to multiple markets will not only test the validity of the present study, but it will also allow cross-market comparisons to be made, potentially allowing researchers to examine the drivers of web reputation in different locations and market segments. Lastly, in future research, it would be desirable to broaden the definition of hotel web reputation by adding in the statistical model other measures besides positive and negative items included in online comments. For example, the Trustyou.com reputation index or the Reputation Quotient and Reptrak, introduced by the Reputation Institute, could be employed.

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Towards a Better Understanding of the Cognitive Destination Image of Euskadi-Basque Country Based on the Analysis of UGC

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Abstract The user-generated content (UGC) and web 2.0 have allowed substantial changes in the dynamics of the travel and tourism sector. Tourism marketing is conditioned by the importance of the Internet as a channel for promotion and marketing. Thus, UGC and social networks become a valuable source to achieve a proper management of the cognitive image that a visitor can have on a destination. Despite the great importance of the destination image there is not a universally accepted and validated model. The presented research work aims to contribute in the knowledge and understanding of the cognitive destination image of the Basque Country through the UGC. The present work aims to validate an image model of reference by means of digital content. The final goal is to produce the method, which enables to relate the perceived image by visitors with the projected image by marketing strategies driven by the DMO.

Keywords Destination image · Image model · Content analysis · Natural language processing · Text mining · Online experiences · Social media analysis

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1 Introduction

The opinions and experiences are central to almost all human activities and are key factors in influencing our behaviour. Our beliefs and perceptions of reality, and the decisions we make, are largely conditioned by how others see and evaluate the world. For this reason, when we have to make a decision often seek the opinions of others. The user-generated content UGC (User Generated Content), and in particular, the online comments have allowed substantial changes in the dynamic of entire sectors. Such is the case of the travel and tourism sector. Consumers no longer rely exclusively on official sources to obtain information about destinations and services. According to some studies, visitors take into higher consideration UGC because those comments are based on experience (Pan et al. 2007, 2008). This allows consumers to obtain a more complete image of the destination and its products (Pang et al. 2011).

In regards to these trends, tourism marketing is conditioned by the importance of the Internet as a channel for promotion and marketing (Llantada 2013; Gartner 1993). Furthermore, shopping and contracted services are not influenced only by the suggestions of advertising campaigns and marketing strategies, but by the reviews that other consumers have written on online forums (public and private) provided by the web 2.0 (Somprasertsri 2010; Yang et al. 2009; Xiang and Gretzel 2010) as TripAdvisor (O'Connor 2010), Twitter (Jansen et al. 2009), Facebook (Cvijikj and Michahelles 2011), etc.

Social networks are affecting very directly to brands and e-commerce. Considering the major social networks, Facebook reaches 85 % of Internet users, Tuenti 36 % and Twitter 32 % experiencing a growth to become the third network. Facebook is the social network where the role of brands is more important: 65 % of those with active account follow a brand, and the average is 2.3 brands per person. 33 % of twitter users follow a brand, and the average number of brands by users is 2.16 (Llantada 2013).

Much of the UGC is generated by social networks such as Twitter and Facebook. Millions of users use them every day and this information is valuable for modelling the vision of the tourist destination. Social networks support the complete cycle of tourism in which the traveller seeks inspiration in the opinions of other travellers to choose their destination before planning.

The UGC and social networks become a valuable source to get insights about the image of the destination. The analysis of the discourses on the web provides an approach to extract information and knowledge associated with how destination is perceived, motivations, underlying discourses. Several Works have conclude that this content analysis may assist to understand the positioning of destinations, their products, services and their industries (Ortiz et al. 2010; Popescu and Etzioni 2004). Hence, a proper management of perceptions or images that a potential visitor can have on a destination contributes to create a different positioning (Stepchenkova and Morrison 2008), accordingly the destination image is presented as a key factor (Echtner and Richie 1991, 1993; Chon 1991).

Despite the great importance of the destination image (Gartner 1986, 1987), there is not a universally accepted and validated model (Crompton 1977; Baloglu and McCleary 1999a). In this research the reference model proposed by Gómez et al. (2012) will be apply to model an innovative model based on UGC. In order to scale the model properly, for this paper only cognitive aspects (Fridgen 1987) are taken into account. For that reason, the aim of this research is to focus on understand the cognitive destination image (Stepchenkova et al. 2005) of the Basque Country by means of the UGC. Hereafter, the model proposed by Gomez et al. (2012) will be validated. A new framework is to produce, which enables to relate the perceived image by users with the projected image by marketing strategies driven by the DMO. This work will involve automatic semantic identification of opinions from social networks using a text-mining tool adapted to the domain of the destination, developed by CICtourGUNE and Mondragon Unibertsitatea.

2 Related Work

The understanding of destination image was introduced into tourism studies in the early 1970s by Hunt (1971, 1975), Mayo (1973), and Gunn (1972), but since that date there have been several attempts to provide an overview of the previous destination images studies. However, meta-reviews of destination image research (Gallarza et al. 2002; Pike 2002; Stepchenkova and Mills 2010; Tasci et al. 2007) have shown preferences of tourism researchers for assessing destination images using structured surveys of human respondents, mixed-methods approach advocated by Echtner and Ritchie (1991, 1993), and, more recently, textual data from blogs and websites.

Most tourism scholars generally agree that destination image holds at least two distinctive components—cognitive and affective. The cognitive, or perceptual, element refers to one's knowledge and beliefs about a destination, while affective element refers to a traveller's feelings towards a destination (Baloglu and Brinberg 1997; Baloglu and McCleary 1999c). However, other authors proposed that destination images are formed by four components which are distinctly different from each other but hierarchically interrelated: cognitive, affective, evaluative and behavioural (Boulding 1956). In a more recent study, Echtner and Ritchie (2003) argue that a destination image is processed in a three dimensional space: namely functional, psychological and holistic.

From the cognitive perspective, Gomez et al. (2012) purpose destination image model based on four dimensions: natural and cultural resources, infrastructure and socio-economic environment, social and atmosphere constraints. Although the relative importance of each of these dimensions in the process of forming the image of the destination also varies among different studies (Baloglu and McCleary 1999a, b; Beerli and Martin 2004; San Martín and Rodríguez 2008). Accordingly, to measure these multi-components researchers need to use a

combination of structured and unstructured methods. In the past scholars had a strong tendency to use only structured methods to measure destination images (Jenkins 1999). By using structured methods a researcher asks tourists to rate a set of attributes and applies sophisticated statistical methods to explain a certain group of tourists' destination image.

In order to overcome the limitations of structured methods in image measurement as is dependent upon the researcher's conceptualization, reflecting the researcher's own perceptions of the dimensions, some studies like (Stepchenkova and Zhan 2012), have used UGC and social networks to create maps representing the projected and perceived image of a destination. The referred study used Flickr, a photo-sharing website and identified statistical differences in several dimensions of these images.

With the arrival of new media and communication technologies in recent years, user-generated content (UGC) on the Internet has increasingly been considered a credible form of word-of-mouth. It is important to underline which media has influence on the image, in order to determine the basis of their analysis. Andrade (2010) considers that the image is formed, among other factors, to information from the media or external to the individual (Gunn 1972; Fakeye and Crompton 1991; Baloglu and Brinberg 1997).

The literature considers the amount and variety of secondary data sources as an external variable that contributes significantly to the formation of the image (Gartner and Hunt 1987; Um and Crompton 1990; Bojanic 1991; Gartner 1993; Font 1997; Baloglu 1999c). Depending on the amount and quality of information available to the tourist is exposed, it will develop a certain type of image in its cognitive aspect, since affective image will be generated based on the own characteristics of the consumer (Baloglu and Brinberg 1997). Seeing the importance of this external variable, (Andrade 2010) purposes the most prominent destination websites (either by volume or quality of data), as a data source to build the destination image by the tourist. Social media websites, such as Facebook, Flickr, and Panoramio, allow tourists to share their travel experiences with others by uploading travel photos online, an activity that has gained popularity among internet users.

Today, one in nine persons globally have a Facebook page. The ratio of Facebook page owners in relation to the total population reaches almost 50 % in North America, followed by 37 % in Australia. Searching for and Reading others' opinions online has replaced recommendations from family and friends in the decision making process. According to the American consumers no longer take the recommendations of family or friends at face value. Before deciding whether to purchase recommended products or services, a higher amount of consumers (81 %) look online to verify those purchase recommendations, in particular through researching product/service information (61 %), reading user reviews (55 %) or consulting ratings websites (43 %). More and more travellers document their experience online and publish their perceptions of a destination and its people on their sites.

3 Methodology

This section explains the followed methodology to obtain the cognitive destination image of the region of Euskadi in Spain by visitors, having as reference the conceptual model proposed by Gomez et al. (2012) based on data collected from different digital media: destination sites, general social networks, traveller, blogs, reviews, etc. To achieve this it is necessary to know the meaning of the data applying morphological parsing and semantic categorization techniques.

The methodology follows three main steps: defining and selecting task relevant data, extracting categories from the selected data sources, and transforming the categories into a model. These steps allow the identification of the most relevant data sources and the recognition of the concepts (entities) to facilitate the modelling and subsequent categorization regarding the cognitive image theoretical model of reference. In the first step the data sources are selected and discarded for the later analysis in order to obtain a representative simple of UGC about the domain. In the second step the data is gathered and the natural language processing of the UGC is completed (word lexicons, morphological analysis, named entity recognition, part-of-speech tagging) supported by the destination tourism ontology defined by CICtourGUNE and Mondragon Unibertsitatea. The ontology is an important instrument used for categorization. The last step aligns the categories with the dimensions of the theoretical model of reference. In this way we can conclude which is the image projected by the DMO and what the visitor perceives.

3.1 Defining and Selecting Task Relevant Data

To determine which sources are the most relevant and pertinent to the study a prior analysis was conducted. In this analysis different channels were taken into account: channels focused on tourism, channels conducted by DMO's, and DMO′s specific channels in general social networks. The analysis took into account the quality and quantity of the data from a double perspective, the projected image by the DMO and the perceived image by the visitor. In this way we have obtained the following results shown in Table 1, representing values until April 26, 2013.

Euskadi saboréala. The "Euskadi Saboréala" is the web 2.0 platform of the DMO of Euskadi. Basically, it is a collaborative communication channel, where anyone who wants can share travel experiences in Euskadi.

From the whole site, two sections have been analysed: top experiences, the experiences published by the DMO and the experiences published by the virtual ambassadors. After analysing the data we have concluded not be part of the sample as it has low coverage and little interaction with approximately 270 messages.

Twitter TvEuskadi. In the social network Twitter, we have analysed the tweets of the "TvEuskadi" account, which is the YouTube channel that promotes tourism

Table 1 Channels

Web site	Type of channel	Data volume
TripAdvisor (forum + site)	Reviewers site	≈50,000 posts
Minube	Social network of travel experiences	≈4,000 experiences
Twitter TvEuskadi	Twitter account owned by the DMO of Euskadi	7,266 tweets
'Embajadores de Euskadi' facebook fan page	Facebook account owned by the DMO of Euskadi	12,387 posts
Euskadi saboréala	Virtual community of the DMO of Euskadi	≈270

in Basque Country. You can find videos of food, wine, main cities (Bilbao, San Sebastian, Vitoria-Gasteiz), live streamings, etc.

Facebook FanPage "Embajadores de Euskadi". The "Euskadi ambassadors" fan page is intended to accomplish two aims: to establish long-term relationships with users and create an interactive community of Euskadi ambassadors among users where everyone can participate, contribute and share.

TripAdvisor. TripAdvisor® is the largest travel site in the world. In 2012 represents the greatest traveller review sites worldwide in over 30 countries and in 21 languages that reflect more than 610,000 hotels, 100,000 attractions and 600,000 restaurants in nearly 75,000 destinations. It provides trusted advice from real travellers, collecting lots of reviews written by users.

We have collected about 30,000 reviews for a total of approximately 4,000 products and destinations located in the Basque Country.

Minube. Minube is a travel experience community with over 120,000 users. The comments refer to experiences that may include buildings (museums, cathedrals), locations (Bilbao, Gernika, etc.), food (restaurants), shops, museums, accommodation, entertainment, sports, etc.

3.2 Extracting Categories from the Selected Data Sources

Data Gathering. After source selection in previous section, the next step was to extract data from the selected sources. The data extraction is an automatic process achieved by a Java software program. The download periodicity is defined according to the activity of the channel in terms of creation of new contents. In this step the information is extracted either through API's ("Application Programming Interface") or web scraping techniques depending on the interfaces of data retrieval offered by the data providers. Minube provides a developer API allowing searches with territory (Araba, Bizkaia, Gipuzkoa) and city (Bilbao, San Sebastián, Vitoria-Gasteiz) disaggregation level.

Data from twitter is extracted using the Twitter4 J API (Java library) just providing the user account, in this case "TvEuskadi". The Twitter API limits access to the latest 3,200 states of a user; therefore this is the recovered sample from the 7,266 tweets published from this channel until 26/04/2013.

Facebook is queried through the Graph API. This API shows in a simple and consistent way the Facebook Social Graph (Facebook Social Graph). The social graph represents graph objects (e.g., people, photos, events, pages, etc.) and the connections among them (e.g., friend relationships, shared content, labels forums, etc.). The time framework of the downloaded data goes from October 2010 to April 2013. The remaining data sources are dumped using web crawling and scraping techniques developed ad-hoc.

Entity Categorization. The process of grouping entities into entity categories is called entity categorization. To categorize we need to extract entities achieving a process called named entity recognition (NER). We use a text-mining tool developed by CICtourGUNE and Mondragon Unibertsitatea based on the Wordnet lexical database to carry out this process. Furthermore, in Wordnet, nouns, verbs, adjectives and adverbs are grouped into sets of cognitive synonyms named synsets. This process is necessary because in natural language text, people often write the same entity in different ways. Once the recognized entities are classified we obtain a list of categories, entities and number of occurrences.

The categories are obtained using an ontology created by the authors. As Basque Country is a destination where gastronomy is one of the most important motivations and the modelling of this domain was insufficient in existing tourism ontologies, the authors created one ad-hoc because ontologies have shown to be the right answer to structuring and modelling problems by providing a formal conceptualization of a particular domain that is shared by a group of people. In addition, the association of terms in crucial to understand the discourses. The used text mining tool implements an algorithm for learning generalized association rules supporting the concept hierarchy for categorization and the concept pairs for association. Figure 1 shows an example of a comment published in minube.

Analysing in detail different concepts corresponding with categories and sub-categories can be observed. These concepts correspond to the dimensions of the model. As can be observed in the sample text (written in Spanish), categorization is based on listed entitles. There are some location names as "Borda de Urbía", "Arantzatzu", "Aitzkorri". Also common names such as "hora", "caminata", "casona", "café", "sidra", "patxaran", "bocadillo", "plato combinado", "vistas", "foto", "tranquilidad", "precio" that are entities that will belong to different categories. Among these common names there are concepts we group in the gastronomy category: "café", "sidra", "patxaran", "sandwich", "plato combinado". In addition, "paisaje", "vistas" are part of the natural environment and natural resources.

In our actual experiment the text mining tool discovered a large number of interesting and important non-taxonomic conceptual relations, the atmosphere

```
<city_name>Arantzazu</city_name><provinceid>48</provinceid><poi_name>Bor
da de Urbía</poi_name><date>2012-10-07 00:17:45.0</date><title>Buen
lugar para reposar</title><content>A una hora de caminata desde
Arantzatzu, y a mitad de camino de la cima del Aitzkorri se encuentra
esta casona donde poder tomar un café, una sidra, un patxaran, un buen
bocadillo o un plato combinado contemplando las vistas de la foto, y en
la más absoluta tranquilidad. Quizás se aprovechan algo en el precio,
pero merece absolutamente la pena pasarse por allá. /comment>….
```

Fig. 1 Structure of a comment

concept appears in many different and rich ways qualified as pleasant, charming, good, great, cosy, intimate, caring, lively, relaxed, disco, comfortable, enjoy the atmosphere, lively atmosphere, friendly surfer, footballing environment, unique atmosphere, cosmopolitan, sailor, summery and festive. The same way the term magic appears related to magical day, magical forest, climate magical, magical, magical labyrinth, magical atmosphere/magical moment, magical sunset, magical mountains. All this terms generated by the user match with a dimension of the model. In the same way, the "people" term appears qualified as great, good, friendly, simple, nice, unique, endearing, and enjoyable.

3.3 Transforming the Categories into a Model

This step proceeds to the unification of the categories and subcategories with the four dimensions of the model Gomez et al. (2012) automatically. The first dimension is represented by the REC abbreviation and represents the natural and cultural resources (attractions). This dimension includes nature, architecture, cultural attractions, customs and cultural activities. The second dimension is represented by the INF abbreviation and represents infrastructures and the socioeconomic environment. Within this dimension there are accommodation, entertainment, shopping, development and value for price. The third dimension is represented by the SOC abbreviation and represents Social Conditions. It covers concepts like sustainability, cleaning, security, pollution, etc. The fourth dimension is represented by the ATM abbreviation and represents the Atmosphere (relaxation, absence of mass). Within it there are the peace and rest.

Referring the previous example from Minube (Fig. 1), we can see that the experience has to with more than one dimension of the model. The location names are concepts aligned with the first dimension of the model, natural and cultural resources. The concepts referred to mobility, duration and price impact in the second dimension. Finally, concepts like "buen lugar para reposar" are matched with the atmosphere dimension.

Table 2 Data sources

Web site	Comments	Language	Type of discourse	Avg. entities by comment
TripAdvisor	30,675	es	Elaborated	19
Minube	4,123	es	Elaborated	22
Twitter TvEuskadi	7,266	es, en, eu	Simple	4
'Embajadores de Euskadi' facebook fan page	12,387	es, en, eu	Simple	2
Euskadi saboréala	273	es, eu	Simple	NA

4 Results

The data extraction process obtains as result a set of corpus of text shown in Table 2.

TripAdvisor is the network with the most number of comments with little influence and presence of the DMO but spontaneous user-generated content, thus it is an important data source to know the perceived image of the destination. The DMO does an important effort of communication and promotion with Facebook and twitter. As about 70 % of the visitors in Euskadi are Spanish speakers, the sample of the elaborated discourse taken into account is almost completely in this language. The projected image in twitter and Facebook uses the English to translate original messages in Spanish. The projected image is fostered by ambassadors who are residents; this is why Basque language (eu) appears in discourses. The type of messages or the constraints of the channel mostly relate the type of discourse to the source. The more elaborated discourses show more and better described entities. The categorization process based on the previous corpuses obtains as results four tables, one by each selected data source with the identified entities, number of occurrences, and the corresponding category. Table 3 is an example of these results, showing some of the most relevant terms obtained from TvEuskadi twitter channel classified according to the model.

After performing this process on the selected data sources (identifying the categories and subcategories and making correspondences between terms and categories with the dimensions of the model), we obtain the data modelled according to four dimensions: natural and cultural resources, infrastructure and socio-economic environment, social conditions and atmosphere. The obtained results are in Table 4. The resulting model allows us to approach the cognitive destination image of the tourist about the Basque Country based on the user-generated content while visiting the Basque territory. The model implements the four dimensions that will capture the conceptual structures of the cognitive image of the destination by the perspective of the DMO and the visitor.

Table 3 Minube and TvEuskadi, integration with the model

Minube			TvEuskadi		
Entity	Number of occurrences	Category	Entity	Number of occurrences	Category
Restaurante	1,017	REC	Vía	471	REC
Plato	606	REC	Concierto	173	REC
Cocina	540	REC	Exposición	171	REC
Hotel	455	INF	Turismo	156	REC
Ambiente	322	ATM	Entrada	127	REC
Carta	274	REC	Festival	81	REC
Museo	253	REC	Feria	64	REC
Gente	203	SOC	Teatro	63	REC
Calidad	200	INF	Kulturklik	62	REC
Precio	162	INF	…	…	…
Tienda	42	INF	TranqUilo	1	ATM
			Relajado	1	ATM

Table 4 Model results

Channel	Image	REC (%)	INF (%)	SOC (%)	ATM (%)
Twitter, TvEuskadi	Projected	86.76	8.08	0	5.15
Facebook	Projected and perceived	84.36	1.05	4.15	10.41
Minube, TripAdvisor	Perceived	73.55	11.59	2.70	12.14

5 Conclusions and Future Research

The literature highlighted both the opportunity and the need to better understand the destination image formation in relation to UGC. This study was able to match and in some instances further enhance the findings from the previous literature. In fact, the study has revealed the feasibility of producing a method, which enables to relate the perceived image by users with the projected image by marketing strategies driven by the DMO. The results of the model indicate that the dimension that has a major influence in shaping and determining the destination image is the first dimension (REC) covering natural and cultural resources. In order to validate the Gomez et al. (2012) model it is important to underline that the perceived cognitive image based on user-generated content has a great impact on the first dimension. All the analysed sources have a major impact on the first dimension concerning natural and cultural resources. The type of messages or the constraints of the source, are related to the type of discourse. For instance, twitter messages with maximum of 140 characters express a more direct speech reducing the resulting number of entities and the related qualifier adjectives and adverbs. The more elaborated discourses show more and better described entities.

Furthermore, with respects to the sources and based on the results of Table 2, TripAdvisor is the social network with the most number of comments. This source

has little influence and presence of the DMO, so it is considered the most representative to measure the perceived image because the comments are purely user-generated content. In addition, this source may be taken into account by the DMO as promotional channel. DMO does an important effort promoting the destination using Facebook and twitter, having this activity a direct influence on the projected image.

Regarding the projected and perceived image, we can conclude that basically the DMO′s efforts are focused on the first dimension, everything related to resources such as Nature, Architecture, Cultural Attractions, Traditions, Cultural Activities. There is a significant interest in the subcategory of cultural activities: theatre, exhibition, jazz, etc. This is because the broadcasting of the event agenda by the DMO has a big presence in Facebook and twitter. On the other hand, although the first dimension is also the most important from the perceived image perspective, the third and fourth dimension, social conditions and atmosphere have much more relevance than provided by the DMO. So the DMO should have to consider how to incorporate categories belonging to this dimension in his communication strategy. Following the analysis of the dimensions, it is important to highlight that within the natural and cultural resources, which gastronomy becomes the most relevant category by the quantity of related terms and concepts that appear especially in the user-generated content by visitors. Furthermore, most of the studied sources put special focus on this concept.

The presented conclusions are partial observations and interpretations that can be stated from such a valuable source and results. In addition, the named entity recognition and categorization process provides many variables that are out of the scope of this paper and will be studied in future works, like the sentiment of the speech, the most important points of interest that are commented, This way it is possible to approach with a novel method the attractiveness of a place. To sum up, the analysis of the user-generated content using domain oriented text mining tools provides a novel approach to understand the destination in the way what people says and perceives and what DMO communicates.

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Part VI
ICT and Travellers' Behaviour

Adaptive Strategies to Technological Change: Understanding Travellers Using the Internet for Trip Planning

Zheng Xiang, Dan Wang and Daniel R. Fesenmaier

Abstract With recent developments in technology including social media and mobile computing, the Internet offers many tools for today's travellers. Based upon a large six year study of American travellers' use of the Internet, this study identifies the strategies travellers develop in response to the complex technological environment over a period of time. The results show that American travellers have adopted six distinct strategies in terms of their behavioural responses to the use of the Internet for travel planning. These strategies are relatively stable and can be described by a relatively limited number of information sources and channels. This study advances our understanding of the impact of ICT on travel behaviour and offers insights for the development of new communication strategies for tourism businesses.

Keywords Internet · Travel planning · Adoption · Media repertoire · User profiling

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1 Introduction

Information and communication technology (ICT) continues to change which, in turn, influences the way travellers gain access to and use travel-related information. In recent years there are several important developments that have directly affected how travellers use of information. First, the Internet is now comprised of a huge amount of information which essentially represents the "external memory" for many people, and as a result, individuals have now become increasingly reliant upon it for everyday life (Sparrow et al. 2011). As a result, search engines have become a dominant force that influences travellers' access to tourism products (Xiang et al. 2008). Second, the tremendous growth of social media has changed the dynamics of online communications (Sigala et al. 2012; Xiang and Gretzel 2010). Third, recent developments in mobile computing, particularly with the emergence of smartphones and their apps for travel, creates new locales for information search and use whereby on-the-go travellers' contextual and situational needs become increasingly prominent in guiding travel decisions (Wang et al. 2012).

It is argued that these new developments set the foundation for a continued evolving relationship between the traveller and ICTs and that it is essential that we understand how travellers respond and adapt to these new technologies (Werthner and Klein 1999). Some studies have profiled travellers using the Internet for travel planning purposes (e.g., Beldona 2005; Bonn et al. 1998; Weber and Roehl 1999). However, the majority of these studies were conducted at the early days of the Internet, and they focused on user demographics and characteristics that distinguish them from non-users. Regrettably, little is known about the impact of Internet use on travel behaviour over a period of time, particularly as result of the recent developments in ICT. With this in mind, the goal of this study is to gain an understanding of the strategies travellers developed in response to their use.

2 Research Background

This section provides a critical review of the literature describing Internet users for travel planning purposes. It also discusses the conceptual foundations for understanding travellers' adaptive strategies to technological change within a travel planning setting.

2.1 Internet Users in Travel Planning

Several studies describing Internet users were conducted during the early days when the Internet was becoming significant for travel and tourism. These studies focused attention on user demographics and several aspects related to the use of

the Internet. For example, Bonn et al. (1998, 1999) found that people who used the Internet to search for travel-related information tended to be young and well-educated, and, importantly, were equipped with a computer. Weber and Roehl (1999) also confirmed that those who searched for or purchase travel online were more likely to be 26–55 years of age, to have higher incomes, to be in white-collar occupations, and had more on-line experiences. Beldona (2005) examined generational cohorts (e.g., baby boomer and Generation X) of Internet users in terms of their online travel information search behaviour between 1995 and 2000. His findings confirmed the differences in travel information search behaviour between different consumer generations. Sigala (2005) synthesized the early literature on Internet user profiles and identified a number of demographic, socio-economic, cultural, and behavioural variables that distinguished users from non-users.

While the basic demographic characteristics of online travellers has continued to attract attention from researchers (e.g., Kim et al. 2007), more recent research has focused on identifying how travellers actually use the Internet for planning purposes. For example, Toh et al. (2011) found an association between specific information channels and booking behaviour on hotel websites. More recently, Xiang et al. (2013) identified a number of trends in travellers' use of the Internet; they argue that there is a growing "bifurcation" between traditional online travellers (i.e., those who use the Internet for standard travel products), and those who use alternative (and, perhaps, more human-centric) channels and products in search of deeper, more authentic experiences.

Importantly, this research focused largely on describing early adopters of the Internet based upon their demographics and behavioural characteristics. Indeed, according to the Xiang et al. (2013), the penetration of the Internet among the traveller population in the US reached a level of saturation some years ago and therefore they argue that the basic characteristics of the Internet user has not changed substantially during the past decade. However, the Internet has experienced many changes since the beginning of the new millennium and while the nature of the users has not changed, many of the findings may no longer be valid in describing today's technological environment and use behaviour. Therefore, it is important to understand the various strategies people have developed to manage the increasingly complex technological environment.

2.2 Adaptive Strategies to the Internet

Several conceptual frameworks can be used to describe and explain travellers' adaptation to changes in the Internet. For example, the traveller population as a whole can be seen as an open system which interacts with technological systems and the industry, resulting in continual evolution (Giddens 1976; Von Bertalanffy 1968). Thus, Structuration theory offers a high-level perspective in terms of how components or players in a social technical system interact and evolve. Another important conceptual framework is the Diffusion of Innovation Theory which

explains how and why technology spreads through societies (Rogers 1983). In general, adopters of an innovation can be described using five categories including innovators, early adopters, early majority, late majority, and laggards. Diffusion of innovations is, thus, useful for describing users in terms of their response to technology, particularly when the technology is considered new.

The notion of "media repertoire" is another useful framework that can be applied to describe the way travellers develop strategies to deal with the complexity of the technology. Resulting from the field of communications studies, it was found that people normally have a set of selected (or preferred) information sources based on their needs, interests, and other skills, and this strategy can usually be defined as a "media repertoire" (Reagan 1996; Hasebrink and Popp 2006). Recently, Janiszewski et al. (2013) found that attention to certain information channels increases the level of awareness and its usage. Further, they argue that after using the technology for a certain period of time people tend to "routinize" their preferred media or channels. This work is consistent with Bettman et al. (1991) who argue that people adapt to their changing environment by developing certain information search and processing strategies in order to cope with complex information contexts.

Under this notion of repertoire, it can be argued that travellers have responded to the Internet by developing various response strategies for travel planning including increasing/decreasing involvement in trip planning, increasing/decreasing use of the various technologies, and increasing/decreasing use of traditional channels. Further, it can be argued that travellers maintain a limited (and reasonably fixed) number of information sources and channels, both online and offline, when they are seeking information to prepare for an upcoming trip. Based upon this idea, the goal of this particular study is to answer the following research questions: As a result of using the Internet for travel planning, what strategies have travellers developed in order to adapt to the increasingly complex technological environment? More specifically, what information sources and channels do travellers tend to use more frequently for travel planning purposes?

3 Methodology

An Internet-based survey was conducted each January (either the second week or third week of the month) from 2007 to 2012 using a portion of an online panel of 300,000 American consumers maintained by Survey Sampling International (SSI). The numbers of respondents from each survey ranged from 2,436 (in 2007) to 1,041 (in 2012) and were post hoc weighted according to age, race, and gender in order to represent the American consumer population. The differences in sample size reflect changes in the focus of the annual study on national—regional trends to national-only trends.

The online survey included several sections and took approximately 10–12 min to complete. The first section asked respondents several questions regarding use of

technology in their daily life. Then, a number of questions followed to ask about a variety of aspects related to their travel during the prior year including the purpose of the trip (business vs. leisure), number of trips, and information sources used for trip planning these trips. A number of questions were then asked about the extent to which Internet was used, the trip planning experiences including types of websites used, information search activities, online reservation/payment activities, etc. The travellers were then asked questions related to the outcomes of using the Internet for travel planning including the types of products purchased, channels used to make reservations, and the extent to which reservations/payments were made using the Internet. A subsequent section consisted of several questions regarding travellers' evaluation of their experience with the Internet including the level of satisfaction and perceived usefulness. Finally, a series of questions were used to collect demographic information including gender, race, age of all members of the household, marital status, education level, and total household income.

Traveller response to the internet was measured using the following question: "How has your use of the Internet affected the following aspects of travel planning?" Under this question, there were 14 items related to travellers' behavioural changes including responses such as "number of places/destinations considered to visit", "stops at visitor centres at destination", and "likelihood of calling a travel agency or airline". These responses were measured using a five-point Likert scale ranging from "decreased a lot" (1) to "increased a lot" (5). Among these 14 items, there were three identifiable "domains" that define behavioural response including: (1) changes in travel planning (five items), (2) changes in information channels used (five items), and (3) likelihood of calling to make reservations or for further information (four items). Cronbach's coefficient alpha was calculated to assess the reliability of the domains; the coefficients between these items were all above 0.85 indicating the items within each of the three domains are stable and highly correlated. The average scores for each domain were then calculated and rounded to the nearest integer so as to resemble the original scale.

Cluster analysis was then conducted based upon the scores of the three domains using the K-means procedure. Solutions of different numbers of clusters were examined ranging from 15 to two clusters. The biggest decline of the variance occurred between five and four clusters, but upon closer examination of the aggregated groups it appeared that two groups that were collapsed to make five groups (from a six cluster solution) differed substantively; so further analysis was done. Finally, it was decided to use six clusters as they are reasonably distinct and interpretable. Discriminant analysis was then conducted to test the degree of differentiation between the respective strategies; the results show that the clusters could be reproduced at 98 % accuracy. These six strategies were then examined to understand how the internet has affected their travel planning efforts.

4 Findings

The six groups of respondents represent six distinct strategies travellers have developed in managing the changes in the Internet over the past 6 years. As shown in Fig. 1, there are three "normative" strategies based upon the three behavioural domains, i.e., "trip plan", "channels", and "calling." In addition to these normative strategies, the cluster analysis identified three "mixed" types wherein travellers responded differently in each of the three domains. Each of these traveller groups are described below.

The three normative strategies are characterized as "Super Planner", "Efficient Planner", and the "Does Not Bother Me". The "Super Planner" segment (represent by the red line) responded by indicating their behaviour in all of the three domains had "increased a lot" due to using the Internet for travel planning. That is, they increased a lot the degree to which they were involved in trip planning, they increased a lot their use of the various channels, and they increased a lot the degree to which they used the phone to call for reservations (etc.). This suggests the Internet has highly "positive" impacts on the trip plan, channels used, and calling to make reservations or for further information. This segment of travellers is actively engaged with online sources and other offline channels such as tourism offices, travel suppliers, and travel agencies. It seems reasonable to suggest that the use of the Internet actually "drives" them to utilize other channels for information and transactions as they are extremely highly involved in travel planning.

In sharp contrast is the "Efficient Planner," wherein they "decreased a lot" in all aspects of travel planning due to use of the Internet including the extent to which they are involved in travel planning, the number of channels they use, as well as the degree to which they call/contact travel businesses such hotels or car rental agencies. This finding suggests this segment of travellers know exactly where to find the relevant information online and, thus, may not wish to pursue more information sources and alter their trip plans. Finally different from the "Supper Planner" and "Efficient Planner", the "Does Not Bother Me" group indicated their travel planning efforts were not substantively affected by the advent of the Internet. The results of the cluster analysis of how American travellers adapted to the Internet resulted in there "mixed" strategy groups whereby they changed their travel planning "a lot" while differing significantly in terms of the other two domains.

As can be seen in Fig. 2, the "Does Not Bother Me" group represents the most "popular" strategy as the segment constitutes approximately 35 % of American travellers during the last six years (2007–2012). The "Efficient Planner" represents the segment with the smallest number of travellers (approx. 2.5 % of all surveyed travellers). The "Super Planner" and the three "mixed strategy" groups range from around 10 to 20 %. In general, these segments have been relatively stable over the last six years. However, "Super Planner" group increased considerably since 2010, apparently with some travellers migrating from the "Don't Bother to Change" group (and others as well).

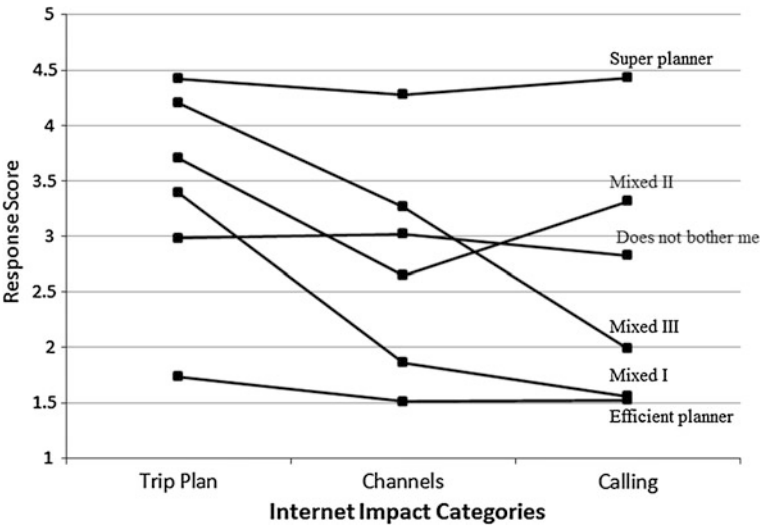

Fig. 1 Adaptive strategies in travel planning using the internet

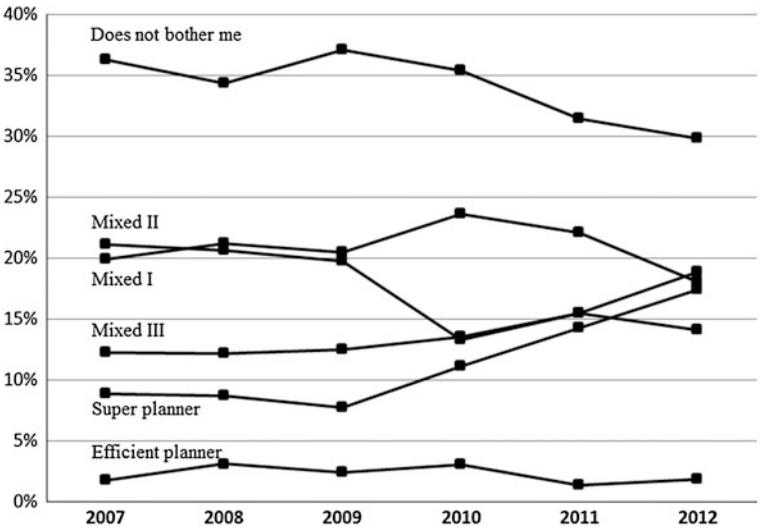

Fig. 2 Variation in internet adaptor segment from 2007 to 2012

A series of cross tabulation (and Chi square) analyses were conducted to understand the underlying travel planning behaviours associated with the six adaptive strategies. Table 1 lists the responses for each group regarding their general attitude or use of technology. As can be seen, the "Super Planner" group stands out as "leaders" in the use of technology; they tend to be more skilled than

Table 1 General use/attitude toward technology by American travel group

Agree or disagree with the statement…	Super planner (%)	Does not bother me (%)	Efficient planner (%)	Mixed I (%)	Mixed II (%)	Mixed III (%)
Skills of finding what I want (strongly or somewhat agree)	91.1	87.8	77.8	91.0	88.3	92.8
Skilled at using internet (strongly or somewhat agree)	85.4	73.3	64.0	79.5	74.9	77.3
Internet gives people more control with technology (Yes)	84.0	65.5	62.2	77.6	75.9	80.7
Used technology a lot compared to my friends (strongly or somewhat agree)	72.4	35.7	33.7	41.9	42.2	43.7
Know new tech before others in social circle (strongly or somewhat agree)	68.4	33.8	34.2	38.7	37.9	43.2
First to buy a new tech in my circle (strongly or somewhat agree)	66.5	26.5	24.9	28.5	30.9	37.8
Own tablet computer (e.g., iPad etc.) (Yes)	37.8	15.5	12.9	20.7	19.5	21.0

Table 2 Websites used in online travel planning by American travel group

	Super planner (%)	Does not bother me (%)	Efficient planner (%)	Mixed I (%)	Mixed II (%)	Mixed III (%)
Online travel agencies	71.4	56.2	44.8	68.3	64.7	74.5
Search engines	64.1	49.0	43.5	58.9	59.6	68.8
Suppliers	55.7	54.6	51.6	66.5	60.8	67.0
Destination sites	45.0	33.0	27.4	41.6	45.1	54.7
Travel search engines	37.6	19.0	10.5	25.0	24.0	30.6
General travel sites	31.9	10.6	13.0	11.5	16.5	24.6
Travel guidebook sites	26.6	8.1	7.7	10.3	17.6	11.2
Travel review sites	25.4	11.6	5.3	18.1	17.3	28.6
Newspaper or magazines	23.4	5.3	4.5	4.2	7.7	10.3
Social networking	19.8	3.9	5.8	4.6	5.9	5.6
Online communities	19.3	4.8	10.5	4.3	8.7	11.6
Photo/video sharing sites	18.7	2.9	3.6	3.2	4.9	5.0
Personal blogs	13.3	4.8	5.3	3.2	5.6	4.8

Note Percentage of respondents who answered "Yes"

Table 3 Variation in online travel planning activities by American travel group

	Super planner (%)	Does not bother me (%)	Efficient planner (%)	Mixed I (%)	Mixed II (%)	Mixed III (%)
Request printed materials/brochures	53.2	29.3	23.3	27.3	41.3	52.2
Print out travel information/online brochures	52.2	35.7	31.4	40.3	46.6	57.1
Watch videos	48.9	11.9	13.5	15.8	19.5	23.1
Print out coupons	48.1	20.9	26.0	25.5	28.5	36.4
Read travel-related blogs	42.1	12.1	15.2	19.1	20.3	26.8
Look at comments/materials other travellers have posted	35.8	24.1	13.5	40.1	38.4	50.2
Use interactive calendar of events	35.3	13.9	12.1	19.4	20.8	29.7
Use interactive trip planners to create personal travel plans	35.0	11.9	12.6	15.6	18.7	26.2
Download videos	26.0	3.1	5.4	2.4	4.7	4.6
Use live chat to talk with travel experts	21.9	2.9	4.9	2.5	5.3	4.7
Listen to travel-related audio files	15.0	2.1	1.3	1.6	4.0	4.0

Note Based upon percentage of respondents who answered "Yes"

their peers and quick technology adopters. The other two normative groups, i.e., "Efficient Planner" and "Does Not Bother Me", are somewhat similar to each other in terms of their general skills of and attitudes toward technology but, overall, they seem to be less positive about how they benefit from technology. The three mixed types seem quite diverse; but, generally speaking they tend to be more technology savvy and more positive about technology than the other two normative groups, i.e., "Does Not Bother Me" and "Efficient Planner".

Table 2 shows the types of websites used by the groups for travel planning. It is obvious that across all these groups, websites such as online travel agencies (OTAs), general purpose search engines, suppliers, destinations, and travel search engines are the most frequently used sources of information. It is interesting to note that general purpose search engines are among the most popular tools. However, there are important differences between these groups. For example, both the "Super Planner" and "Mixed III" groups seem to be active searchers because as OTAs and search engines are the most frequently used sites. The other two normative groups, i.e., "Efficient Planner" and "Does Not Bothe Me" seem to use a relatively limited range of websites. Those American travellers in the Mixed III segment are highly active in using consumer generated content such as travel review sites and participating in online communities. Finally, the "Does Not Bother Me" group, which represents the largest segment in the population, seems to be parallel to the Super Planner while doing everything considerably less.

Table 3 compare the specific activities these groups engaged in online travel planning. Overall, there are a number of seemingly "popular" activities for all of these groups including "request printed materials/brochures", "print out travel information/online brochures", "watch videos", "print out coupons", and "read blogs". However, these activities differ considerably among these groups. For example, almost half (48.9 %) of the Super Planner group watched videos online, while the other two normative groups did substantially less with 11.9 and 13.5 %, respectively, even compared with the three mixed types. And, more than a quarter of the Super Planner group downloaded videos, while the other groups were very limited. Compared to others, the Super Planner group are actively engaged in all activities. Those travellers in the Mixed III segment seem to be highly "functional," but also are active in social media. For example, more than half (50.2 %) of them would "look at comments/materials other travellers have posted", which is a strong factor distinguishing them from other segments.

5 Discussion and Conclusions

Due to the increasingly sophisticated technological environment, today's travellers are, arguably, very different from their peers 15 years ago. Now they understand much better where to find the relevant information, where to get the best deals, and where to start a conversation with other travellers on the Internet. These changes took place as a result of learning and adapting to technology. Profiling travellers

based upon their responses to the Internet for trip planning reveals that the traveller population is not homogenous in terms of how they adapt to the new technological environment. The three normative strategies are typical in that using the Internet for trip planning has had a uniform effect on the behavioural domains within each of those segments. While many travellers do not necessarily change as the result of using the Internet, the Super Planner and Efficient Planner groups represent the two extremes of the adaptive strategy whereby travellers either take full advantage of online/offline channels or seem to intentionally reduce their use of these channels because they have already "figured out" what to look for, respectively.

As the Internet becomes increasingly complex and offers more and more choices for travellers, it is important for tourism businesses to have a good understanding of their behaviour in using the technology. This paper paints a broad picture of how technology could "push" people to develop certain preferences and even habits of use. It seems that the notion of repertoire is useful in understanding how travellers combine online/offline channels. This is important because, once a channel is built into one's media repertoire, the likelihood for it to be used in the future will increase substantially. Future research can apply the media repertoire perspective to understand the specific resources travellers use within travel planning.

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Assessing Structure of Online Channel Use by American Travellers

Yeongbae Choe and Daniel R. Fesenmaier

Abstract Understanding the use of online channels for travel planning is one of the most important challenges facing destination marketing organizations (DMOs). The results of this study found that travellers tend to use a small number of online channels and that there is a strong hierarchical pattern in their use. The results also indicated that the use of online channel could help to distinguish four groups of travellers who differ in terms of demographic characteristics, information searching, product purchasing behaviour and trip expenditures. These findings provide an essential guidance regarding potential strategies for designing and implementing an effective communication programs with prospective travellers.

Keywords Online channels · Guttman scale · Structure · Media repertoire

1 Introduction

The Internet has transformed travellers' behaviours in many different ways, such as obtaining travel information, planning their trip, and purchasing travel products (Jun et al. 2007, 2010; Park et al. 2011; Tussyadiah 2012; The United States Travel Association (hereafter, USTA) 2010, 2011; Wang and Fesenmaier 2013; Xiang and Gretzel 2010). This phenomenon is important for destination marketing organizations (DMOs) since the use of the various online channels is important to connect the industry and travel markets (Hsieh and O'Leary 1993). Consequently, a considerable amount of research have been conducted to understand the use of

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Internet for trip planning, including user characteristics, the impact of the Internet, influencing factors, the process of trip planning, and combination of information channels (e.g., Bieger and Laesser 2004; Beritelli et al. 2007; Gretzel et al. 2012; Hsieh and O'Leary 1993; Hyde 2007; Pan and Fesenmaier 2006). Interestingly, it seems that relatively little of this research has focused on the structure of online channel use for trip planning. However, recent research suggests that channel use generally follows a hierarchical structure whereby most/all travellers use the dominant channels such as online travel agencies (i.e., Expedia or Hotel.com) while others additionally use online travel communities or social media channels. The goal of this study is to identify the underlying structure of the use of online channels for travel planning and to examine potential differences (i.e., in terms of demographic characteristics, information searching, online activity, and online trip product purchasing behaviour) between those online travellers with different online channel use patterns.

2 Background

Travellers use a number of different types of online channels for their trip planning. For example, general search engines such as Google enable travellers to navigate through the Internet so as to find relevant and useful information for their trip planning (Xiang et al. 2008; Fesenmaier et al. 2011). And, social media has been widely used by travellers to search the information and share their experience through blogs and micro blogs, online virtual community, media sharing sites, social bookmarking sites, and social knowledge sharing sites, and other tools in a collaborative way (Leung et al. 2013; Xiang and Gretzel 2010). However, some of research in communication literature found that people generally do not use all possible information channels, but rather limit their use to a small number of channels which meet their needs and which fit within a set of constraints (Hasebrink and Popp 2006; Taneja et al. 2012; Reagan 1996). Therefore, this research would argue that travellers may not use all possible information channel while their trip planning process. Keep this in mind, this study seeks to first identify how online trip planners combine the various online channels for their trip planning, especially focusing on their structural (or hierarchical) relationships. The second goal of the study is to examine the differences between those travellers that use simple online strategies (i.e., use a single channel) and those that use a number of channels while planning a trip.

3 Methodology

Two research questions guide this study: (1) What is the nature of online channel use by American travellers?, and (2) Do travellers differ with respect to demographic characteristics (gender, age, income, etc.) and trip planning behaviours

Table 1 Demographic characteristics of respondents (n = 1,043)

Variable	Frequency (%)
Gender	
Male	49.0
Female	51.0
Age	
18–21 years	4.6
22–29 years	16.8
30–39 years	20.8
40–49 years	17.6
50–59 years	19.8
60–69 years	16.2
70 and above	4.2
Current employment	
Employed full-time	49.2
Employed part-time	14.8
Retired	16.2
Not employed	18.5
Annual household income	
Less than $20,000	7.2
$20,000–$29,999	8.6
$30,000–$39,999	10.7
$40,000–$49,999	11.1
$50,000–$74,999	22.6
$75,000–$99,999	17.1
$100,000–$149,999	12.8
$150,000–$199,999	4.6
$200,000 or more	2.0
Highest education level	
Less than high school	0.9
Completed high school	11.9
Some college, not completed	29.3
Completed college	37.4
Post graduate work	20.1

(information searching and product purchasing)? A series of analyses was conducted in order to answer these research questions. In particular, frequency analysis was first conducted to examine the patterns of online channel use. Then, cross-tabulation was used to assess the hierarchical structure through the Guttman scaling procedure. Finally, analyses using Analysis of Variance (ANOVA) and Chi square analysis were conducted to answer the remaining questions.

Data were collected using a national-wide web survey of Americans who had travelled and used the Internet during the calendar year 2012. The survey was conducted January 7–9, 2013 using online panel maintained by Survey Sampling

Table 2 Use of online channels by American travellers

Online channel	Frequency	Percentage
Online travel agency sites	707	69.0
Company sites	635	62.0
Search engines	592	57.8
Destination sites	412	40.2
Travel search engines	268	26.1
Travel review sites	193	18.8
Social networking sites	167	16.3
General travel sites	166	16.2
Travel guidebook sites	123	12.0
Photo or video sharing sites	113	11.0
Newspaper or magazine sites	107	10.4
Special interest and online community sites	94	9.2
Personal blogs	64	6.2
Micro blogs	39	3.8

International (SSI). Among the 1,184 respondents, 88.1 % (1,043) indicated they used the Internet to plan their trip (i.e. make a reservation) and had taken a trip 50 miles or more, one-way from home or that included an overnight stay during 2012. Survey questionnaire included a number of questions related to online channel use, travel behaviours, online travel planning, online trip products purchases, and the demographic characteristics. In particular, a list of 14 online information channels were chosen from previous tourism literature and industrial reports in order to ensure its validity and reliability of this study.

In this study the Guttman scaling procedure was used to examine the cumulative structure of online channel use during an online trip planning stage, where each type of online channel and respondents can be scaled based on a 'scalability matrix' (Ekinici and Riley 1999; McIver and Carmines 1981). In particular, the respondent was asked if they used (yes/no) 14 online channels when planning their most recent trip (see Table 2). The Coefficient of Reproducibility (CR), the Minimum Marginal Reproducibility (MMR), and the Coefficient of Scalability (CS) were used to test the scalability of the response patterns (Fesenmaier et al. 1993; Guttman 1950; McIver and Carmines 1981; Roehl 1990; Park et al. 2011). The CR is a measure of the relative degree to which actual response patterns match up with ideal patterns; and the formula for CR can be expressed as follows (Guttman 1950):

$$CR = 1.0 - \frac{No.\,of\ errors}{Total\ responses}$$
$$= 1.0 - \frac{No.\,of\ errors}{(No.\,of\ items) \times (No.\,of\ respondents)}$$

The minimum acceptable value is 0.90, which means a standard of 10 % error, suggested by Guttman (1950). Edwards (1957) also suggested the needs of

comparing MMR with CR in that extreme marginal distributions tend to inflate the value of CR.

$$MMR = \frac{Total\ responses - marginal\ errors}{Total\ responses}$$

In addition, Menzel (1953) pointed out that the value of CR varies depending on the marginal distribution of category and then proposed the CS as defined by the following formula:

$$CS = 1.0 - \frac{No.\ of\ errors}{Maximum\ errors\ (ME)}$$

$$ME = (No.\ of\ items) \times (No.\ of\ respondents) - \sum_{Individual\ 1}^{Individual\ N} S_{max}$$

where S_{max} = sub-score (frequency of responses) for the modal category of an individual.

The value of CS should meet the following two requirements: (1) CS should be lower than 0.90 and CR, (2) CS should be between 0.60 and 0.80 (Stouffer et al. 1950).

4 Results

Table 1 presents the demographic characteristics of the respondents. Among 1,043 respondents, 49.0 % were male and 51.0 % were female. The highest number of participants reported their age between 30 and 39 years (20.8 %), followed by a group between 50 and 59 years (19.8 %), and between 40 and 49 years (17.6 %). The majority of respondents (86.8 %) had at least some college education: some college but no degree (29.3 %), completed college (37.4 %), and post graduate (20.1 %). The highest number of respondents answered their annual household income between $50,000 and $74,999 (22.6 %), followed by a group with income between $75,000 and $99,999 (17.1 %), and a group whose member earned between $100,000 and $149,999 (12.8 %). Approximately half (49.2 %) of the respondents indicated them as a full-time employees and about a fifth (18.5 %) was not employed.

4.1 Use of Online Channels for Trip Planning

Table 2 summarizes the popularity of online channel use by American travellers during 2012 and indicates that the half of online travellers used online travel agency sites (69.0 %), travel company sites (62.0 %), and search engines

Table 3 Scalability matrix of online channel use (unit: %)

	Number of online channel use							
	1	2	3	4	5	6	7	8 or more
Online travel agency sites	48	64	69	73	80	79	92	95
Company sites	31	53	67	72	76	83	82	91
Search engines	10	49	63	73	82	87	88	97
Destination sites	3	17	38	55	69	79	78	89
Travel search engines	2	7	18	33	40	60	66	82
Travel review sites	2	2	8	20	25	63	52	77
Social networking sites	1	4	9	18	28	37	34	62
Photo or video sharing sites	0	1	4	12	19	16	20	70
General travel sites	1	2	10	14	31	30	58	65
Newspaper or magazine sites	2	1	6	6	12	11	32	74
Travel guidebook sites	1	1	4	11	15	32	38	70
Special interest and online community	1	1	4	8	14	13	28	53
Personal blogs	1	1	2	5	4	6	20	50
Micro blogs	0	0	1	0	4	3	12	38
Number of responses	200	200	200	147	99	63	50	66

Note Coefficient of reproducibility (CR) = 0.89; Minimum marginal reproducibility (MMR) = 0.67; Percentage improvement = 0.22; Coefficient of Scalability (CS) = 0.67

(57.8 %), followed by destination sites (40.2 %) and travel search engines (26.1 %). These findings are consistent with previous research indicating that online information channel have been supplemental to offline channel (i.e. travel agency, travel company) for trip planning and/or product purchasing even if Internet have become the primary sources for trip planning (Jun et al. 2007, 2010; Wolfe et al. 2004).

The next step of the study focused on identifying the overall patterns of online channel use. The analyses indicate that, on average, American online trip planners used 3.6 online channels for their trip planning. Interestingly, approximately three-fourths (72.9 %) of American online trip travellers use up to four information channels for their trip planning, while the rest of travellers use five or more online channels.

Next step used a multiple response analysis to construct a scalogram based on the number of online channel use for trip planning where it is posited that channel use follows a hierarchal structure. As can be seen in Table 3 and Fig. 1, out of total respondents that used only one channel, 48 % of the respondents used online travel agency sites and 31 % used travel company sites; this leaves only 21 % used some other channels for trip planning. Among online trip planners that used two online channels, the percentages of online travel agency sites and/or travel company sites increased to approximately 64 and 53 %, respectively; further, the percentages of trip planners using general search engines (3rd) and destination sites (4th) increased substantially to 49 and 17 %. For the travellers using three online channels, the use of online travel agency, general search engines, and travel

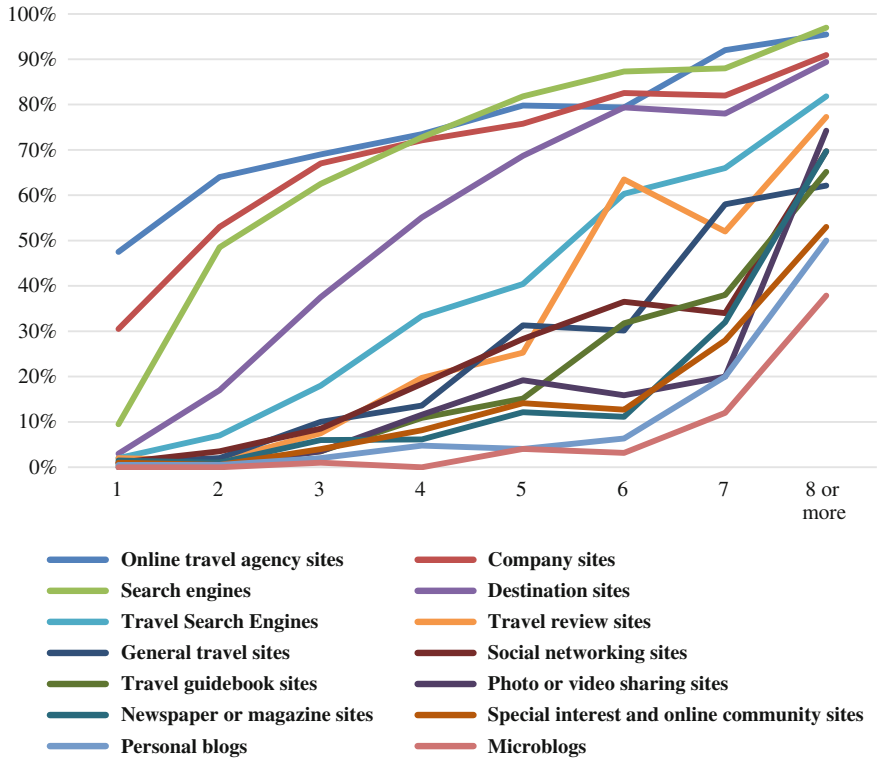

Fig. 1 Online channels use behaviours

company sites increased to slightly less than 70 %, and for the respondents using four channels, destination websites appear to become one of major information channels as the percentages increased to 55 %. As well as this, social networking sites, photo/video sharing sites and other sites are becoming additional online travel-related channels when respondents increased the number of their channel use. The results reveal a clear cumulative pattern of online channels use for online trip planning process.

Using Guttman analysis, this study assessed the extent to which a cumulative structure of online channel use actually exists. As the first step in this analysis, the ideal patterns (i.e. which is a perfect cumulative pattern) and actual patterns (i.e. which are an observed response patterns) were derived from the raw data, and then the amount of error was computed as measured by the deviations of the observed response patterns from the perfect cumulative pattern. In ideal patterns, the proportion of each channel use continually increases up to 100 % in general. For example, the percentage of online travel agency sites user increased from 48 % (at only one channel) to 95 %. Along with a gradual increasing pattern, the percentage of online channels use for trip planning located above in the scalogram matrix

should exceed those located below. If each response does not follow the above two requirements, those cases are errors. Based on this approach, the CR value (0.89) is slightly less than the minimum acceptance value (Guttman 1950; McIver and Carmines 1981). However, the values for MMR of 0.67 and CS of 0.67 meet the requirements, implying that the use of online channel for trip planning has a reasonably strong hierarchical and cumulative structure.

A final step in this analysis sought to identify a more general pattern in online channel use. The results indicated that the online channel use patterns can be categorized into four respondents groups. More specifically, one group includes those who used one or two core online channels for trip planning—online travel agency sites and company sites; and represents 39.0 % of the respondents that are described as '*Group* 1'. The second group used three or four channels, mostly online travel agency and company sites along with general search engine and destination sites; and is labelled '*Group* 2', which includes 33.9 % of online trip planners. Respondents included in the third group used five to seven travel-related channels including online travel agency, travel company sites, general search engines, destination sites, travel search engines, and travel review sites; and are labelled '*Group* 3'. This group accounts for 20.7 % of American online trip planners. Last, a fourth group is labelled '*Group* 4' as they used eight or more online travel-related channels including all types considered in this study; and represents 6.4 % of online trip planners.

4.2 Differences in Demographic Characteristics Among Groups

A series of Chi square analyses was conducted to examine the differences in demographic characteristics among the respective groups. Table 4 summarizes the results of these analyses and indicates that each group is significantly different ($\alpha = 0.05$) in terms of current employment, highest education, and age generation, but not gender, age, and annual household income. While the predominant category for the current employment is respondents who employed as a full-time worker across all groups, group 4 shows the highest portion of full-time employments (60.6 %) but the lowest portion of retired or not employed respondents (12.1 and 6.1 %, respectively) among groups ($\chi^2 = 26.753$, $p < 0.01$). On the other hands, Group 1 shows the opposite patterns, including the lowest portion of full-time employers (43.8 %) and the highest retire and not employed respondents (19.0, 21.3 %). There are also statistically different in the highest education among four groups ($\chi^2 = 45.158$, $p < 0.001$). Respondents in Group 4 are more educated ('completed college' = 45.5 %, 'post graduate' = 22.7 %) whereas respondents in Group 1 are slightly less educated ('completed high school' = 17.5 %, 'some college, not complete' = 32.5 %). Although there is no statistical difference in age group, the proportions of age generation are slightly

Table 4 Differences in demographic characteristics among groups

	Group 1	Group 2	Group 3	Group 4	χ^2
Gender	%	%	%	%	6.197
Male	51.0	43.5	52.4	53.0	
Female	49.0	56.5	47.6	47.0	
Age					20.657
18–21	6.0	2.9	3.8	4.5	
22–29	16.3	17.0	16.0	22.7	
30–39	17.5	22.5	21.2	28.8	
40–49	16.8	16.4	20.8	21.2	
50–59	20.8	20.5	19.3	12.1	
60–69	17.3	17.0	15.6	7.6	
70 and above	5.5	3.7	3.3	3.0	
Current employment					26.753**
Employed full-time	43.8	48.4	58.0	60.6	
Employed part-time	14.3	15.3	13.2	21.2	
Retired	19.0	16.1	12.3	12.1	
Not employed	21.3	18.7	16.5	6.1	
Education					45.158***
Less than high school	0.8	1.2	0.9	–	
Completed high school	17.5	8.1	9.9	3.0	
Some college, not completed	32.5	29.1	23.1	28.8	
Completed college	34.8	38.6	37.7	45.5	
Post graduate work started or completed	14.3	22.2	28.3	22.7	
Annual household income					18.838
$0–$29,999	19.3	13.8	10.4	18.2	
$30,000–$49,999	24.0	21.6	19.8	21.2	
$50,000–$99,999	38.5	40.6	42.0	33.3	
$100,000 and above	15.5	20.2	24.1	25.8	
Age generation					22.785*
Young (Born between 1990 and 1994)	9.0	6.3	5.2	9.1	
Gen Y (Born between 1981 and 1989)	18.0	19.0	21.7	30.3	
Gen X (Born between 1965 and 1980)	25.8	30.0	29.2	36.4	
Baby Boomers (Born between 1946 and 1964)	38.8	38.6	40.1	19.7	
Greatest (Born between 1924 and 1945)	8.5	6.1	3.8	4.5	

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

different across all four groups ($\chi^2 = 22.785$, $p < 0.05$). Group 4 includes more Gen X and Y and fewer Baby boomers as compared to other groups.

Table 5 presents the results of analyses examining differences in terms of types of information search for trip planning, online products purchasing, and spending on trips among four groups. The average number of information searched are

Table 5 Differences in types of information searched, online trip products purchases, and online spending among groups

	Group 1	Group 2	Group 3	Group 4	Total	F-value
Types of information						
Hotel prices or places to stay	55.8[a,b,c]	74.6[a,d]	85.4[b,d]	89.4[c]	70.4	28.225***
Info. about a particular destination	53.0[a,b,c]	72.6[a,d,e]	87.3[b,d]	93.9[c,e]	69.4	37.965***
Airline fares and schedules/ flight times	53.5[a,b,c]	65.7[d,e]	74.1[b]	86.4[c,e]	64.0	14.979***
Things to do at the destination	23.0[a,b,c]	53.3[a,d,e]	72.6[b,d,f]	89.4[c,e,f]	47.8	83.027***
Potential destinations to visit	26.0[a,b,c]	48.4[a,d,e]	70.3[b,d]	80.3[c,e]	46.2	56.836***
Rental car prices and availability	29.8[a,b,c]	38.0[d,e]	57.1[b,d,f]	81.8[c,e,f]	41.6	32.677***
Travel discount or promotion	20.3[a,b,c]	39.8[a,d,e]	61.3[b,d]	74.2[c,e]	38.8	53.064***
Dining and entertainment	16.3[a,b,c]	39.2[a,d,e]	64.6[b,d,f]	83.3[c,e,f]	38.3	83.087***
Maps and/or driving directions	15.5[a,b,c]	32.6[a,d,e]	50.5[b,d]	63.6[c,e]	31.6	42.744***
Local event calendars at the destination	8.3[a,b,c]	26.8[a,d,e]	46.2[b,d,f]	69.7[c,e,f]	26.3	69.903***
Travel packages for resorts, etc.	11.0[a,b,c]	27.1[a,d,e]	40.6[b,d,f]	66.7[c,e,f]	26.1	47.971***
Stores or other places to shop	11.8[a,b,c]	26.8[a,d,e]	38.2[b,d,f]	68.2[c,e,f]	26.0	45.099***
Cruises	9.0[a,b,c]	21.0[a,d,e]	33.0[b,d,f]	56.1[c,e,f]	21.1	37.536***
Sites that distribute travel brochures	1.0[a,b,c]	8.1[a,d,e]	20.8[b,d,f]	53.0[c,e,f]	10.8	75.503***
800 numbers	1.8[b,c]	2.3[d,e]	10.8[b,d,f]	34.8[c,e,f]	6.0	48.742***
None of the above	3.3[a]	0.6[a]	–	–	1.5	5.012**
Number of information searched	3.36[a,b,c]	5.76[a,d,e]	8.13[b,d,f]	10.91[c,e,f]	5.64	253.078***
Online trip products purchases						
Lodging accommodations	59.8[a,b,c]	75.9[a]	77.0[b]	89.1[c]	70.8	13.722***
Airline tickets	68.2[c]	61.3[d,e]	78.0[c,d]	89.1[e]	69.3	9.856***
Car rental	35.3[b,c]	40.9[d,e]	55.5[b,d,f]	79.7[c,e,f]	44.4	19.811***
Tickets to attractions/events	22.6[a,b,c]	44.9[a,d,e]	60.5[b,d,f]	78.1[c,e,f]	41.8	45.894***
Travel package	8.2[a,b,c]	17.6[a,e]	21.5[b,f]	53.1[c,e,f]	17.2	29.734***
Cruise reservations	5.7[b,c]	10.2[e]	13.5[b,f]	40.6[c,e,f]	11.2	24.394***
Sport activity reservations	1.9[a,b,c]	8.7[a,e]	13.0[b,f]	34.4[c,e,f]	8.7	28.688***
RV rental/purchase	0.5[c]	2.5[e]	2.5[f]	21.9[c,e,f]	3.0	31.149***
Average number of purchased	2.17[a,b,c]	2.91[a,d,e]	3.97[b,d,f]	6.70[c,e,f]	3.10	137.979***
Average spending on trips						
Average spending for pleasure trips	1737[a,b,c]	2289[a,d,e]	3193[b,d,f]	4272[c,e,f]	2409	30.457***
Average spending for business trips	1803[c]	2353[e]	2543[f]	3721[c,e,f]	2,420	5.053**

Note Percentages and totals are based on respondents. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Tukey's post hoc analysis was used. [a] A comparison between Group 1 and Group 2. [b] A comparison between Group 1 and Group 3. [c] A comparison between Group 1 and Group 4. [d] A comparison between Group 2 and Group 3. [e] A comparison between Group 2 and Group 4. [f] A comparison between Group 3 and Group 4

statistically different among four groups (F-value = 253.078, $p < 0.001$). Respondents in Group 4 searched more information (about 11 out of 15 types) for their trip planning. In addition, four groups searched each type of information at different degree, meaning that the use of online channels may relate to the needs of travellers' information searching behaviour. Group 4 searched all types of information (e.g., hotel prices or places to stay) significantly more than other groups. Group 1 did relatively limited information searching behaviour to some of core travel decisions, such as accommodation, a particular destination, and airline ticket. This contrasts sharply with Group 4 and 50 % of Group 4 searched the information about 14 different types of information. Groups 2 and 3 lie somewhere in between, but respondents in Group 3 searched more types of information than those in Group 2.

In terms of online products purchasing and average spending on trips among groups, each group shows different purchasing behaviours in terms of trip products and their total spending for trips. In particular, spending for lodging and airline tickets are two core online trip products for entire respondents and therefore, are similar across all groups; however, travellers that comprise Group 4 purchased more diverse products (e.g., car rental, tickets, and travel packages) than other groups.

5 Conclusions

The results of this study confirm that there is a strong hierarchical pattern in the use of online channels for trip planning by American travellers. That is, online travel agency sites are "essential" for all travellers. Further analysis based on those patterns revealed that online trip planners are different in terms of demographic (i.e., current employment, education, and age generation), information searching behaviour (i.e., type of information sought), trip product purchasing behaviour, and spending on trip.

This study provides theoretical contributions to tourism literature. First, the results of Guttman analysis indicate that the use of information channel constitute a uni-dimensional scale that can measure the extent of information channel usage in the trip planning process. Second, this study clearly demonstrates that the 'Guttman scale' is a robust measurement for assessing structure of online channel use. Therefore, future research could use these measurement items to categorize travellers into several distinctive groups.

Following these theoretical contributions, this study also provides several practical implications for DMOs and tourism suppliers. First, these results identify the core online channels travellers use no matter what else they do. DMOs and tourism suppliers could allocate their resources wisely and turn their attentions to highly profitable channel. Second, the results clearly document the 'progression of sophistication' in online travel planning and demonstrate that there are important

differences between those that use only one channel and those that use, for example, five channels.

Lastly, the results provide future research directions. Previous experience (year of Internet use and level of experience) and actual use (passive and active use) would be another influencing factors affecting trip planning and use of information channel. In addition, multidimensional scaling (MDS) could provide additional insights in order to understand differences among respective groups.

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Older Tourists: An Exploratory Study on Online Behaviour

Vania Vigolo and Ilenia Confente

Abstract The Internet has reshaped the way consumers can search for and purchase tourism products. While various studies about online behaviour have addressed the 'Y generation', little attention has been given to older adults, particularly within the tourism industry. This article investigates older tourists' online behaviour in an increasingly ageing context (Italy). In particular, the study focuses on past travel behaviour and online experience as antecedents of online purchase intentions. An exploratory research was conducted among a sample of 205 tourists aged 50 years and older. The findings reveal that online travel purchase intention positively depends on online word-of-mouth, previous online travel purchase, and education. In addition, significant behavioural differences emerge between prospective seniors and seniors. This study contributes to fill a gap in tourism literature about older tourists. Moreover, it provides useful insights and practical implications for hospitality and tourism companies willing to approach the senior market.

Keywords Online behaviour · Online purchase intentions · Word-of-mouth · Prospective seniors · Seniors · Tourism industry

1 Introduction

The adoption of information and communication technologies (ICTs) and the proliferation of online communities have fostered tourists to change their consumption behaviour. In particular, the Internet has enriched tourists' travel experience by

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expanding information sources and purchase possibilities. Understanding tourists' current and prospective behaviour with regard to online tools might impact on how destinations and businesses create, develop and distribute their services and products (Moutinho et al. 2011).

While tourists' online behaviour has been widely explored with regard to the youngest part of the population (Nusair et al. 2012), less has been said about older tourists (seniors and prospective seniors). However, according to the United Nations, developed countries are facing an unprecedented population ageing. In particular, the greatest proportion of ageing people is located in Europe (UN 2009). For example, people aged 65 and older will comprise more than 28 % of the population in Germany and 25 % in Italy by 2030 (European Commission 2012). This is relevant because "although there is a large disparity in revenue and wealth among seniors, in industrialised countries they have a purchasing power that is above average", thus representing a potential customer base for the tourism industry (Thébault et al. 2013: 22).

This study intends to examine the online behaviour of older tourists in an increasing ageing country, such as Italy. In particular, this research aims to answer the following research questions: (1) What are the determinants of older consumers' intention to buy tourism products online? (2) Are there any differences between senior and prospective-senior consumers in the propensity to buy online tourism products?

The paper opens by reviewing the impact of the Internet on tourists' decision making process and then focuses on older consumers as a potential target for the tourism industry. After that, the method and the main findings of the study are described, suggesting possible future directions for this stream of research.

2 Theoretical Background

2.1 The Impact of Internet on Consumers' Decision Making Process for Tourism Services

Internet has become the predominant means of travel shopping in European countries (Buhalis and Law 2008). Moreover, the advent of user-generated content (UGC), such as online communities and social media, has changed the way consumers and marketers communicate (Nambisan and Baron 2007). Firstly, customers are connected in numerous ways that were not available in the past, including through social networking sites, blogs, wikis, recommendation sites, and online communities (Hennig-Thurau et al. 2010). In this sense, tourists can be seen as "co-marketers, co-designers, co-producers and co-consumers of travel and tourism experiences" (Sotiriadis and van Zyl 2013: 104). Secondly, Internet and particularly online reviews can play a significant role for consumer decision making, as they help to increase awareness, obtain information and form opinions

and attitudes, to purchase products, and share past travel purchase experience (Mangold and Faulds 2009). In particular, the electronic Word-of-Mouth (e-WOM) has become important in travel planning (Litvin et al. 2008) since travellers are more likely to trust other tourists' e-comments rather than travel agent websites (Pantelidis 2010).

This new environment has caused marketers to reconsider how they define and understand customer-to-customer interactions and their importance to the firm (Wen 2009). However, the Internet might have both positive and negative impacts for tourism companies. Positive impacts include more effective distribution channels (Carroll and Siguaw 2003; O'Connor and Murphy 2004) and disintermediation (Buick 2003). Negative impacts could be online pricing transparency, price competition and reduced customer loyalty (O'Connor and Murphy 2004). In this challenging context, it is therefore of uttermost importance to understand how tourists deal with the potentialities offered by the Internet.

2.2 Investigating Older Tourists: A Focus on Online Behaviour

Following Chen et al. (2013), older adults can be classified into prospective seniors (aged 50–64) and seniors (aged 65 and above). Studying prospective seniors is relevant because their consumption behaviours could be used in the future to predict senior tourism segmentation and tailor new tourism products for this market (Jang and Wu 2006).

The importance of the older-adult travel market has been widely recognised by tourism marketers and researchers (Hunter-Jones and Blackburn 2007). The literature has primarily focused on older adults' travel motivations (Jang et al. 2009; Le Serre and Chevalier 2012; Le Serre et al. 2013), psychological factors (Jang et al. 2009), experience characteristics (Hunter-Jones and Blackburn 2007; Batra 2009), service needs and perceptions (Wang et al. 2013; Chen et al. 2013). However, little research has been conducted on the influence of Internet and UGC in the senior market (Kohlbacher and Chéron 2012; Le Serre and Chevalier 2012). As a matter of fact, most published studies on online behaviour deal with young consumers, the so called "Y generation" (Nusair et al. 2012). Therefore, the framework for this study derives mainly from extant literature on general consumers' and tourists' online behaviour.

To implement effective marketing strategies, for tourism companies it is important to understand the drivers of tourists' online purchase intentions. Online purchase intention is measured in a subjective way through the perceptions of tourists in relation to their own behaviours (San Martín and Herrero 2012).

Previous studies about the determinants on online purchase intention have investigated customers' perceptions and attitudes, such as perceived risk (e.g. Zheng et al. 2012), price competitiveness (e.g., Degeratu et al. 2000), ease of

use/design aspects of the online platforms (e.g., Wen 2012); as well as prior tourism behaviour (e.g., information search, previous purchasing behaviour).

Due to the complexity to consider all these variables, this research intends to focus on older tourists' online experience rather than perceptions towards the online context. This is particularly relevant in Italy, where only 19.5 % of the over-55 population uses the Internet [www.audiweb.it (June 10, 2012)]. A first step towards the understanding of older tourists' intention to buy online is to explore their past/current travel behaviour and their online experience. Therefore, investigating more specific attitudinal variables (such as perceived variety of products offered by the internet or perceived-value for money) is beyond the scope of this study. This has led us to identify the antecedents summarized in Table 1.

3 Method: Questionnaire Design, Data Collection and Analysis

For the purpose of this study, a self-administered questionnaire was designed. Before conducting the survey, the questionnaire was pre-tested among 20 older tourists and minor modifications were made. Based on previous literature review, the final questionnaire included items related to demographic information, past travel behaviour and online experience (see Table 1), and propensity to buy online tourism- and non-tourism-related products.

The lower age parameter of 50 years (Chen et al. 2013) was chosen for selecting an age-quota sample. A non-probability sampling technique, known as snowball sampling, was adopted. This type of sample means that those people interested in participating in the study could act as a referral to generate other potential participants. Though subject to a degree of bias, this method is appropriate for generating information from individuals who have particular characteristics, but are quite difficult to locate and contact (Lee et al. 2010). Snowball sampling has been adopted in recent tourism studies (e.g. Del Chiappa 2013; McLennan et al. 2014), as well as online consumer behaviour studies (Richard et al. 2010; Filieri and McLeay 2013) and senior consumers studies (e.g. Sudbury and Simcock 2009). The first voluntary participants were recruited the North-East of Italy. Eventually, a usable sample size of 205 respondents was obtained, whose age ranged from 50 to 81 years (average age 59.5).

The Statistical Package for the Social Science 17.0 (2008) was employed for the analyses of results, which included descriptive statistics, multiple regression analysis, t-tests and Chi square tests. The regression analysis was conducted to investigate the following relationship:

Table 1 Selection of antecedents of online purchase intention for tourism products

Variables	Literature support for each variable
Offline WOM	Families and friends represent the most important information source in helping older adults to determine a vacation destination (Capella and Greco 1989; Patterson 2007). Moreover, WOM communication through satisfied tourists is a key element in influencing older people's decisions about their preferred holiday destinations (Jeong et al. 2003)
Online WOM	Exposure to online WOM influences tourists' online purchase intention (Chatterjee 2001; Godes and Mayzlin 2004; Sparks and Browning 2011)
Past online purchases	Past online purchase experiences can have a direct impact on online purchase intentions (Eastlick 1996; Weber and Roehl 1999; Elliot and Fowell 2000; Shim et al. 2001; Monsuwé et al. 2004; Wiesberg et al. 2011)
Online purchases through other people	Older consumers are reported to have learnt how to use the Internet and make online purchases with the help of peers and relatives (Eastman and Iyer 2004). This needs to be tested for tourism products
Past online holiday purchases	This variable has been considered as a determinant of tourism online purchase intention (Kim and Kim 2004)
Online holiday information seeking	This item is well developed in the literature and its influence on the intention to buy an online product has been explored (Engel et al. 1995; Shim et al. 2001)
Education	Education has been used in purchasing models and is positively linked to the likelihood to purchase online (Li et al. 1999). This is also confirmed for tourism products (Lee et al. 2007)

$$y = \beta_0 + \beta_1 offline\ wom + \beta_2 online\ wom + \beta_3 past\ online\ purchases + \beta_4 online\ purchases\ through\ other\ people + \beta_5 past\ online\ holiday\ purchases + \beta_6 online\ information\ seeking + \beta_7 education + \varepsilon$$

where,

y	is the likelihood to buy online a tourism product (e.g. holiday, flight, accommodation etc.) in the next 12 months (that ranges from 1 to 5, from very unlikely to very likely);
Offline WOM	is the impact of comments about tourism products made by family members/friends/acquaintances on tourists' purchasing decision (yes or no);
Online WOM	is the influence of online reviews about tourism products on tourists' purchasing decision (yes or no);
Past online purchases	are previous online buying experiences (yes or no);
Online purchases through other people	are previous online buying experiences through the help of other people (yes or no);
Past online holiday purchases	are previous online buying experiences of tourism products (yes or no);
Online holiday information seeking	is the activity of searching for online commercial information (e.g. tour operators' or hotels' websites) about tourism products (yes or no);
Education	ranges from primary education (1) to higher education (2)

Dummy variables (Hair et al. 2002) have been used in regression analysis in recent studies (Füller et al. 2012), also in the tourism context (Fuchas and Weiermair 2004; Kang et al. 2012).

4 Results

The sample profile is presented in Table 2. Based on the age parameter, respondents were categorised into two groups: *prospective seniors* (from 50 to 64 years old) and *seniors* (65 and over). Seniors accounted for the 21.1 % of the final

Table 2 Respondents' socio-demographics (n = 205)

Characteristics		Characteristics	
Age (years), mean	59.4	Occupation status (%)	
Prospective seniors	78.9	Currently employed	56.6
Seniors	21.1	Retired	32.5
Gender (%)		Housekeeper	8.9
Male	48.3	Unemployed	1.5
Female	51.2	Other	0.5
Marital status (%)		Education (%)	
Married	70.2	Primary	30.7
Widowed	9.3	High school/University	68.8
Divorced	2.0	Other	0.5

Table 3 Respondents' travel behaviour and online experience

Travel behaviour and online experience	Percentage
Travelled in the last two years	88.8
Prior travel choice based mainly on offline WOM	72.2
Prior travel choice based mainly on online WOM	22.0
Online purchase experience	45.4
Online travel purchase experience	38.5
Online travel purchase experience through other people	29.3
Online information search before travel purchase	74.1
Wrote an online travel review	8.8

sample, while prospective seniors accounted for 78.9 %. The majority of the respondents were female (51.2 %), married (70.2 %) and currently employed (56.7 %). The majority (68.8 %) had higher education (high school or university diploma).

With regard to travel behaviour and online experience, respondents' profile is described in Table 3. As concerns online purchase intentions, respondents expressed a moderate intention to buy tourism products (mean = 2.6 from a range of 1–5) and other unspecified products (mean = 2.7).

In order to answer to research question number (1), multiple regression analysis was conducted to examine the relation between seven antecedents and the intention to buy tourism products online (Table 4). Predictors were also tested for problems with multicollinearity. Only for one variable (previous online purchase) the variance inflation factor (VIF) was above the critical value of 2.5. For the other predictors, the VIF values were close to 1, therefore suggesting no strong correlation between the variables. Not all the variables considered appeared to be significant predictors of the likelihood to buy travel products online. In particular, offline WOM, previous online purchase and online information search were not significant predictors. In order to improve the model and avoid collinearity problems, predictors with critical VIF value and $p > 0.05$ were excluded from the

Table 4 Regression analysis—exploring the determinants of online travel purchase

Determinants	β	Std error	Standardised β	t	F	VIF
Constant	1.074	0.232		4.621**	31.828	
Online WOM	0.665	0.212	0.166	3.136**		1.166
Previous online travel purchase	1.549	0.246	0.454	6.297**		2.168
Prior online travel purchase (other)	0.475	0.184	0.131	2.585**		1.069
Education	0.455	0.194	0.126	2.341*		1.217
Offline WOM	0.217	0.185	0.058	1.168		1.044
Previous online purchase	0.413	0.263	0.124	1.570		2.589
Online information search	0.160	0.213	0.042	0.753		1.310

$R^2 = 0.533$; Adjusted $R^2 = 0.517$
*$p < 0.05$; **$p < 0.01$

Table 5 Regression analysis—significant determinants of online travel purchase

Determinants	β	Std error	Standardized β	t	F	VIF
Constant	1.330	0.155	–	8.594**	53.875**	1.087
Online WOM	0.786	0.206	0.541	3.819**		1.217
Previous online travel purchase	1.849	0.185	0.136	9.978**		1.035
Prior online travel purchase (other)	0.495	0.182	0.150	2.723**		1.138
Education	0.538	0.189	0.196	2.853**		1.087

$R^2 = 0.521$; Adjusted $R^2 = 0.511$
**$p < 0.01$

Table 6 T-test- differences between prospective seniors and seniors

	Prospective seniors		Seniors				
	Mean	SD	Mean	SD	M diff.	t	df
Intention to buy online	2.82	1.69	1.95	1.41	0.87	3.415**	74.9
Intention to buy tourism products online	2.91	1.67	2.09	1.47	0.82	2.884**	201

**$p < 0.01$

model. A subsequent regression analysis was performed. As can be seen in Table 5, VIF values improved, being all close to the value of 1.

The predictors explain 51.1 % (adjusted $R^2 = 0.511$) of the variation in the likelihood to purchase a tourism product on the Internet. The significant F-ratio ($F = 53.875$; $p < 0.01$) indicates that the goodness-of-fit of the model is satisfactory. Online WOM represents an important determinant of buying intentions, showing a positive and significant coefficient ($\beta = 0.541$; $p < 0.01$). Other significant predictors were previous online travel purchases ($\beta = 0.136$; $p < 0.01$), prior online travel purchase made by others on one's behalf ($\beta = 0.150$; $p < 0.01$), and education ($\beta = 0.196$; $p < 0.01$).

In addition, to answer to research question number (2), a *t* test was performed to investigate differences in online buying intentions between seniors and prospective seniors. As shown in Table 6, prospective seniors expressed significantly higher propensity ($t = 3.415$; $p < 0.01$) to online purchase than seniors (mean = 2.8 vs. 1.9). Prospective seniors also showed significantly higher intention ($t = 2.884$; $p < 0.01$) to purchase tourism products online than seniors (mean <2.9 vs. 2.1).

In order to explore further differences between the two groups of tourists, a Chi square test was performed on a set of categorical variables regarding respondents' travel behaviour and online experience. Significant differences between the two groups emerged. Specifically, prospective seniors are more likely than seniors to decide about their travel based on online WOM ($\chi^2 = 10.929$, $p < 0.01$), to buy online in general ($\chi^2 = 9.844$, $p < 0.01$) and to buy tourism products online ($\chi^2 = 4.700$, $p < 0.05$). In addition, prospective seniors are more likely to search travel information online ($\chi^2 = 36.003$, $p < 0.01$) and to write an online review about their travel experience ($\chi^2 = 3.975$, $p < 0.05$).

5 Implications and Limitations

This study intended to investigate whether past travel behaviour and online experience influence older tourists' online purchase intentions. In addition, it explored behavioural differences between prospective seniors (aged 50–64) and seniors (65 and over). Firstly, the findings reveal that *online WOM* and *previous online travel purchase positively influence* older tourists' likelihood to buy tourism products online. In this sense, the findings extend previous literature (Chatterjee 2001; Godes and Mayzlin 2004) to the older-tourist segment. This study also suggests that *context-specific online experience* rather than generic (non tourism-related) online experience can enhance the likelihood to buy tourist services online. As a matter of fact, generic prior online purchase experience was not a significant predictor in the regression analysis. Similarly, although the majority of respondents based their travel decisions on *offline* WOM rather than online WOM, offline WOM was *not* a significant predictor of online buying intentions.

Interestingly, online information search, related to company advertising, website, promotional links, was *not* a significant predictor either. This could be explained by the fact that online commercial/promotional information is perceived as less reliable than UGC. In this sense, the findings are consistent with extant literature concerning tourists' use of information sources (Bruwer and Thach 2013). Moreover, the study supports previous research (Porter and Donthu 2006; Lee et al. 2007) suggesting that education plays a significant role in influencing online purchase intentions. Highly educated older tourists are more likely to use the Internet for travel purchase than less educated older tourists.

Prospective seniors show significant differences in their behavioural patterns compared with senior tourists. In particular, prospective seniors expressed higher propensity to purchase online in general and to purchase online tourism products.

These results allow interesting implications *from a managerial perspective*. Concretely, in the next years, the senior tourist market will be more sensitive to online information sources and specifically to online WOM. Therefore, tourism managers could rethink their communication and distribution strategies to reach this target more effectively. In particular, firms and destinations willing to attract older tourists through the new media should monitor UGC and concentrate on peer-to-peer communication rather than on commercial communication (Confente 2012; Sotiriadis and van Zyl 2013).

Lastly, a secondary result is that older tourists use ICTs not only for information seeking, but also for information sharing. However, even though most of the respondents were familiar with online information sources (included UGC), only a minority had ever posted online comments or reviews about their travel experience. *From a managerial perspective*, this could suggest the opportunity to stimulate passive readers to become active senders, thus enhancing the role of online WOM as an influential source for other older tourists.

This study contributes to fill a gap in tourism research, providing a better understanding of how older tourists' online experience can influence their future online buying behaviour. Moreover, the findings provide useful insights and practical implications for hospitality and tourism companies willing to approach the senior market.

However, some limitations should be considered. Firstly, as mentioned before, although snowball sampling is a convenient and economic method to collect data, it is necessary to note that the use of a non-probability approach may produce biased results. Moreover, the base of respondents must be expanded to provide more robust insights. In addition, the population of this study was limited to the Italian context, in which the ageing population phenomenon is particularly evident. Replicating similar studies in other European and non-European countries would be imperative for increasing the generalizability of these findings. Lastly, this study focused on past behaviour and online experience rather than on attitudes towards the online context. Hence, other variables not included in this study (such as perceived risk in online purchase context, perceived price convenience etc.) could play a significant role in determining the intention to buy a tourism product online. Moreover, personal features such as dietary restrictions or health problems may influence older tourists' purchase behaviour. Therefore, further investigation is necessary to allow a better understanding of older tourists' online shopping behaviour.

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Analysing the Traveller Activities Network for Strategic Design: A Case Study of Baltimore, MD

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Abstract Destination management organizations (DMOs) must understand the pattern of traveller activities within a destination and how this creates value in order to design competitive destinations. It is posited in this study that it is useful to conceptualize traveller activities as a value creation network formed by the interactions of visitors and destination attractions and that this network can be measured to understand destination performance and competitiveness. As a case study, this research quantifies and then deconstructs the traveller activities network for the City of Baltimore that is activated as visitors move between destination attractions. The results of this analysis are presented and the ways in which value creation network metrics can inform the strategic design of the destination are discussed. Last, a research agenda to further develop these metrics is outlined.

Keywords Destination design · Performance metrics · Value creation · Tourist activated networks

1 Introduction

The metaphor "traveling-the-network" has been used to describe the tourist behaviour of utilizing ubiquitous Internet technology to plan, experience, and share all phases of travel (Fesenmaier and Xiang in press; Gretzel 2010; Zach and Gretzel 2011). In this context, a destination network is comprised of the touch

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points (both virtual and physical) that are experienced by the traveller. Examples of these touch points include the websites and mobile apps used to plan a visit, the online booking engine used to pay for a hotel stay, the places visited including hotels, restaurants and attractions, and the sharing of vacation photos over social media (Stienmetz and Fesenmaier 2013). While enhancing the tourist experience, traveling-the-network has also resulted in increasingly complex patterns of tourism product disintermediation (Kracht and Wang 2010) and potentially threatens the competiveness of destinations as the result of a diminished leadership role of the destination management organization (DMO), lower cohesion between destination firms, fewer partnerships among firms, a decreased knowledge of the visitor profile, and a reduced capacity to satisfy visitors' specific needs (Chathoth 2007; Ndou and Petti 2007). Consequently, it is argued that DMOs must take on the role of network managers with the responsibility of designing the collaboration and cooperative efforts of the individual stakeholders that comprise a destination (Meriläinen and Lemmetyinen 2011; Wang and Fesenmaier 2007; Wang and Xiang 2007; Zach and Gretzel 2011).

It is argued in this paper that in order to be effective network managers DMOs must understand the structure of the destination network because "if you can't measure it, you can't manage it" (Kaplan and Norton 1996, p. 21). In particular, it is crucial for strategic network managers to recognise the patterns of traveller activities within a destination and how those activity patterns are translated into value (Shih 2006; Woodside and Dubelaar 2002; Zach and Gretzel 2011). Furthermore, if the objectives of the DMO include coordinating the relationships and interactions among destination actors, then the DMO must understand the interrelationships among the various actors within the destination, especially as seen from the perspective of the visitor (Tax et al. 2013). This research applies a series of metrics within the context of Baltimore, Maryland (USA) to illustrate how an understanding of the structure and value of traveller activities can assist in destination design.

2 The Traveller Activities Network

Stienmetz and Fesenmaier (2013) have conceptualized the tourism destination as a constellation of four visitor-centric value creation networks that represent the processes of (1) marketing and promotion, (2) sales and distribution, (3) traveller activities, and (4) partnership coordination. Importantly, destination value networks exist in both physical and virtual space, are focused on capacity, are constantly evolving, and are occurring simultaneously as part of an integrated system. The structure of each value creation network within the destination value system can be understood by using traditional network analysis metrics such as node degree centrality, betweenness, and clustering coefficients. Considered individually, the structure of each value creation network provides valuable insight into destination performance, but when the value creation networks are considered as an integrated

system they provide the basis for improving destination competitiveness and performance (Stienmetz and Fesenmaier 2013). Similar to the destination value chain model, it is recognized that performance evaluation of a destination value network with regard to each separate value creation process is needed in order to maximize traveller value and, in turn, to develop marketing and development strategies that can make the destination more competitive (Ritchie and Crouch 2003; Ritchie and Ritchie 2002; Wöber 2002). In other words, DMOs can benefit from the ability to evaluate each value creation process, both separately and together as part of an inter-related and dynamic destination ecosystem.

Within the destination value system, the interaction of travellers and destination attractions is represented by the traveller activities network which is comprised of nodes that represent either a unique visitor or a unique attraction within the destination. Importantly, because nodes represent either travellers or destination firms, ties connecting network nodes represent three types of relationships: traveller to traveller exchanges (C2C), firm to firm exchanges (B2B), and firm to traveller/traveller to firm exchanges (C2B). C2C ties represent the sharing of experiences, either virtually or through physical co-presence at destination locations. B2B ties, on the other hand, represent the exchange of tourists between destination attractions and reveal the volume of visitor movement between attractions within the destination. Additionally, the C2B ties reveal the frequency of traveller visits that are made to each attraction and patterns in the paths that are activated as travellers physically move through the destination (Stienmetz and Fesenmaier 2013).

3 Case Study: Baltimore Tourism

Baltimore, Maryland (USA) was used as a case study to examine the viability of the metrics proposed by Stienmetz and Fesenmaier (2013) for strategic destination design. A series of analyses were conducted as part of this case study. First, in order to understand the structure of the traveller activities network, a weighted B2B network was created where nodes represent destination attractions and ties represent the sharing of travellers between attractions. This weighted network was then analysed using the tnet package written for the statistical software package R (Opsahl 2009) and the network analysis program Gephi 0.8.2 (Bastian et al. 2009) in order to identify the structure and relationships among the attractions in Baltimore's traveller activities network. First, the role and relative importance of each attraction within the traveller activities network was ascertained through application of the network centrality metrics of weighted degree centrality and weighted betweenness. Next, the identification of network sub-structures was achieved by examining the weighted clustering coefficient of each attraction within Baltimore's traveller activities network. Then, clusters of Baltimore attractions forming small-world communities were identified through the application of a network modularity algorithm using the Gephi 0.8.2 software package. Last,

Baltimore's 2B2 traveller activities network is represented geospatially using Gephi 0.8.2 in order to gain additional insights for strategic destination design.

Data used to describe Baltimore's traveller activities network were generated using an online survey of individuals that had requested information from the Baltimore, Maryland DMO (Visit Baltimore) between January 2007 and July 2013. A list of 58,697 email addresses was obtained from the DMO and after invalid and redundant email addresses were removed, an invitation to complete the online survey was sent to 53,166 email addresses. In order to increase response rate, the following three-step process was followed: (1) an initial invitation was emailed out along with the URL of the survey, (2) four days later a reminder was delivered to those who had not completed the survey, and (3) the final request for participation was sent out to those who had not completed the survey one week later. These efforts resulted in 2,855 usable responses, which translates to a 5.4 per cent response rate. Of the 2,855 usable survey responses, this study focuses on the subsample of 1,329 travellers that indicated they visited Baltimore since January, 2013.

4 Results

4.1 B2B Network Creation

In order to specify the B2B traveller activities network, respondents were asked "During your most recent trip to or through Baltimore, did you stop at any of the following places or do any of the following activities in Baltimore?" Respondents were then asked to choose those places visited from a list of the main attractions in Baltimore. In total, there were 43 separate Baltimore attractions and activities that were identified by the Baltimore DMO and listed in the survey. Each item was coded as 1 if the respondent visited the attraction or 0 if the respondent did not visit the attraction. For Baltimore, the average number of attractions visited was 3.45 (SD = 3.24). Table 1 shows the frequency in which each attraction was visited, along with the frequency of the visit being a planned or repeated.

Based on which Baltimore attractions were visited a 43 × 43 matrix corresponding to the traveller activities network was then created for each survey respondent. Each individual matrix was defined by coding a 1 at the intersection of any two destination touch points that were visited by the same respondent, and placing zeros in all other cells where the touch points were not visited. The B2B weighted matrix for the traveller activities network was then calculated by summing all 1,329 individual respondent matrices. In this way, the rows and columns of the matrix represent the 43 main destination attractions/activities within the destination (nodes), and each cell value represents the number of shared travellers between nodes (tie weight). Within the B2B weighted matrix the tie weights ranged from 0 (representing no connection between two nodes) to 207 (the number of shared visitors shared by the National Aquarium and the Harborplace shopping area). The average tie weight for the entire B2B weighted matrix was 12.

Table 1 Frequency of activated nodes within the traveller activities network

Attraction/Activity	Frequency	% planned	% first visit
A01: Basilica of the Assumption	6.9	50.0	75.6
A02: Edgar Allan Poe Gravesite	7.3	60.9	70.1
A03: Ft. McHenry National Monument	24.8	72.6	70.6
A04: Frederick Douglas—Isaac Myers	3.1	35.1	75.7
A05: Maryland Science Centre	9.7	61.2	56.9
A06: Maryland Zoo	5.4	75.0	64.1
A07: National Aquarium	34.2	79.9	53.2
A08: Orioles/Camden Yards	28.3	79.1	46.0
A09: Sports Legends at Camden Yards	8.8	57.1	61.0
A10: Star-Spangled Banner Flag House	6.5	41.0	79.5
A11: USS Constellation/Historic Ships	20.5	51.8	61.6
A12: Washington Monument	13.0	49.7	55.5
A13: Top of the world observation level	8.5	51.0	68.6
A14: American Visionary Art Museum	7.1	52.9	68.2
A15: B&O Railroad Museum	5.7	73.5	51.5
A16: Babe Ruth Birthplace and Museum	5.5	66.7	65.2
A17: Baltimore Museum of Art	6.1	57.5	60.3
A18: Baltimore Museum of Industry	2.0	54.2	83.3
A19: Civil War Museum	3.0	33.3	75.0
A20: Geppi's Entertainment Museum	1.9	43.5	69.6
A21: Jewish Museum of Maryland	0.8	66.7	66.7
A22: Maryland Historical Society	1.9	47.8	65.2
A23: National Great Blacks in Wax Museum	2.4	69.0	41.4
A24: Port Discovery Children's Museum	2.7	68.8	62.5
A25: Museum of African American History	2.3	46.4	71.4
A26: The Walters Art Museum	6.0	64.8	57.7
A27: Baltimore (First Mariner) Arena	3.4	61.0	51.2
A28: Baltimore Symphony Orchestra	1.1	61.5	38.5
A29: Bromo Seltzer Tower	1.6	31.6	78.9
A30: CenterStage	1.7	13.6	9.5
A31: Everyman Theater	0.5	71.4	64.7
A32: Harborplace	38.1	64.2	42.8
A33: Hippodrome Theater	1.5	44.4	72.2
A34: Power Plant Live	11.8	41.8	51.1
A35: The Gallery Shopping Center	19.2	43.2	51.1
A36: The Lyric	0.9	54.5	54.5
A37: Fell's Point Walking Tour	8.1	38.1	70.1
A38: Heritage Walk Tour	2.7	40.6	68.8
A39: Mount Vernon Walking Tour	2.8	54.5	60.6
A40: Spirit Cruises/Seadog	5.0	55.0	61.7
A41: The Original Fell's Point Ghost Tour	1.5	61.1	72.2
A42: Urban Pirates	1.3	62.5	75.0
A43: Watermark Cruises	4.4	48.1	69.2

4.2 Node Centrality

A number of network metrics, such as degree centrality and betweenness, can be used to describe the structure of the networks and determine the importance of individual nodes within the networks. Node centrality is a measure of the importance of a node within the network. The more central the position of a node, the greater the node's power (Borgatti and Halgin 2011). A node of high centrality is usually considered more influential than other nodes because centrality gives a node access to more information and results in the node performing coordination functions within the network (Bhat and Milne 2008). Therefore, attractions with high centrality within the destination value network should be considered especially important in determining the competitiveness of a destination.

Node betweenness is a measure of the extent to which a particular node lies between various other nodes within the network. Nodes with high betweenness can be considered boundary spanners as they occupy important points in the structure of the network and often play critical roles. The flow of resources (such as knowledge) within the network also depend on the ability of boundary spanners to create relationships between other nodes within the network (Easterby-Smith et al. 2008). Attractions with high betweenness identify structural holes within the destination network whereby large numbers of visitors pass through before interacting with other clusters of destination attractions (Borgatti and Halgin 2011). Further, the more diverse attractions are within the destination value network, the more critical the role of a boundary spanner is for the management of resources between attractions (Carlile 2002).

The weighted B2B networks were analysed using the tnet package written for the statistical software package R (Opsahl 2009) in order to quantify the structure of the networks and determine degree centrality and betweenness of the individual attractions within the networks. Weighted degree centrality for each destination attraction was calculated according to Eq. 1 and weighted betweenness centrality was calculated according to Eq. 2, where i is the focal node, j and k are all the other nodes in the weighted matrix ω in which ω_{ij} is greater than 0 if node i is tied to node j, and the value is the weight. Within the weighted matrix g_{jk} is the number of shortest paths between node j and node k, and $g_{jk}(i)$ is the number of those paths that go through the focal node (Opsahl et al. 2010).

$$C_D^{\omega}(i) = \sum_j \omega_{ij} \tag{1}$$

$$C_B^{\omega}(i) = \frac{g_{jk}^{\omega}(i)}{g_{jk}^{\omega}} \tag{2}$$

Weighted degree centrality analysis results shown in Table 2 reveal that the most connected, and therefore the most important attractions in determining Baltimore's competitiveness, are the Harborplace shopping area (1864) and the National Aquarium (1780), followed by the Orioles/Camden Yards (1417), Fort

Table 2 Network metrics for the traveller activities network

Attraction/Activity	Wt. Degree	Wt. Betw.	Wt. ClusterCoeff.	Cluster
A02: Edgar Allan Poe Gravesite	548	0	0.9724	0
A03: Fort McHenry National Monument	1,411	46	0.9722	0
A10: Star-Spangled Banner Flag House	533	0	0.9730	0
A19: Civil War Museum	250	0	0.9901	0
A43: Watermark Cruises	302	0	0.9766	0
A06: Maryland Zoo	397	0	0.9688	1
A14: American Visionary Art Museum	461	0	0.9721	1
A17: Baltimore Museum of Art	431	0	0.9647	1
A22: Maryland Historical Society	204	0	0.9755	1
A28: Baltimore Symphony Orchestra	81	0	0.9761	1
A05: Maryland Science Center	718	0	0.9695	2
A07: National Aquarium	1,780	298.5	0.9688	2
A13: Top of the World Observation Level	670	0	0.9717	2
A24: Port Discovery Children's Museum	190	0	0.9727	2
A34: Power Plant Live	862	0	0.9687	2
A42: Urban Pirates	96	0	0.9744	2
A08: Orioles/Camden Yards	1,417	162.5	0.9675	3
A09: Sports Legends at Camden Yards	648	0	0.9737	3
A16: Babe Ruth Birthplace and Museum	461	0	0.9759	3
A20: Geppi's Entertainment Museum	155	0	0.9819	3
A01: Basilica of the Assumption	475	0	0.9722	4
A11: USS Constellation/Historic Ships	1,289	3	0.9751	4
A37: Fell's Point Walking Tour	555	0	0.9707	4
A39: Mount Vernon Walking Tour	229	0	0.9779	4
A12: Washington Monument	839	6	0.9691	5
A15: B&O Railroad Museum	434	0	0.9672	5
A18: Baltimore Museum of Industry	193	0	0.9756	5
A26: The Walters Art Museum	434	35	0.9718	5
A29: Bromo Seltzer Tower	158	0	0.9851	5
A33: Hippodrome Theater	117	0	0.9645	5
A36: The Lyric	82	0	0.9631	5
A27: Baltimore (First Mariner) Arena	249	0	0.9683	6
A30: CenterStage	130	0	0.9665	6
A31: Everyman Theater	44	0	0.9692	6
A38: Heritage Walk Tour	266	0	0.9638	6
A41: The Original Fell's Point Ghost Tour	131	0	0.9640	6
A04: Frederick Douglas—Isaac Myers	239	0	0.9781	7
A21: Jewish Museum of Maryland	48	0	0.9983	7
A23: National Great Blacks In Wax Museum	144	0	0.9882	7
A25: Museum African American History	231	0	0.9549	7
A32: Harborplace	1,864	396	0.9695	7
A35: The Gallery Shopping Center	1,098	0	0.9709	7
A40: Spirit Cruises/Seadog	342	0	0.9681	7

McHenry (1411), and the USS Constellation (1289). Likewise, weighted node betweenness analysis results shown in Table 2 identify the key attractions that serve as boundary spanners within the destination. Harborplace (369.0), the National Aquarium (298.5), Orioles/Camden Yards (162.5), Fort McHenry (46.0), and the Walters Art Museum (35.0) are found to be the key boundary spanners within the destination. These network metrics clearly identify the destination partners with which the DMO much engage in order to increase the chances of successfully designing a more competitive destination.

It is noteworthy that the attractions with the highest weighted degree centrality are also those attractions most visited within the destination. However, the centrality measures are not simply a measure of visitor frequency, but instead provide insight into the structure of the destination value system and show the level of interconnectedness of attractions. In other words, Baltimore's top attractions are clearly embedded within the destination value system and not just visited in isolation or individually. Additionally, while all attractions have some measurable level of importance based on their degree centrality, Table 2 reveals that the structure of the network is such that only a handful of attractions are positioned to serve as boundary spanners within the destination. Furthermore, the weighted betweenness analysis shows that an attraction with lower degree centrality can still have high betweenness and play a key role as a boundary spanner. The Walters Art Museum illustrates this point, as it is a key boundary spanner that provides an important link between Baltimore's mainstream attractions and a visited cluster of cultural attractions and museums.

4.3 Cluster Detection

Clustering refers to the degree to which each node and its immediate neighbors are all directly linked to each other (Freeman 2011). Importantly, clusters represent cohesive sub-structures within a network that benefit from high embeddedness (Jackson 2010). 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 et al. 2008, p. 81). Embeddedness of tourism organizations has been found to foster inter-organizational trust and the promotion of knowledge transfer and learning (Bhat and Milne 2008). This suggests that attractions within the same cluster are more likely to create successful collaborations compared to attractions outside of their cluster. Equation 3 shows the algorithm for determining a node's weighted clustering coefficient, a metric calculated as all pairs of nodes linked to node i that are also linked to one another, where the normalization factor $s_i(k_i - 1)$ accounts for the weight of each edge times the maximum number of triplets that it may participate in (Barrat et al. 2004).

$$C_i^{\omega} = \frac{1}{s_i(k_i - 1)} \sum_{j,h} \frac{(\omega_{ij} + \omega_{ih})}{2} a_{ij} a_{ih} a_{jh} \tag{3}$$

Table 2 shows the weighted clustering coefficient for each attraction within Baltimore's traveller activities network. All values are above 0.96, indicating that all nodes within the network are highly connected with each other. This can be considered a positive feature of Baltimore's activities network, as isolation among clusters and over-embeddedness have been associated with poor firm performance and difficulty in transferring knowledge between clusters (Levine and Kurzban 2006).

While understanding the clustering coefficients of each node is valuable for identifying attractions that may be too isolated from the rest of the system, it is also important to understand how the nodes cluster and form network substructures. The clusters of nodes forming communities within a large network can be identified through modularity analysis of the network. As shown in Eq. 4, the modularity of a cluster is a comparison of the density of links inside the cluster as compared to the density of links between clusters, where A_{ij} represents the weight of the edge between i and j, $k_i = \sum_j A_{ij}$ is the sum of the weights of the edges attached to vertex i, and c_i is the community to which vertex i is assigned (Vincent et al. 2008).

$$Q = \frac{1}{2m} \sum_{i,j} \left[A_{ij} - \frac{k_i k_j}{2m} \right] \delta(c_i, c_j) \tag{4}$$

Based on Eq. 4, the number of distinct clusters within a large network can be determined by algorithms that optimize the modularity of the network, such as the modularity function in Gephi 0.8.2. As reported in Table 2, modularity analysis finds eight distinct clusters of attractions within Baltimore's traveller activities network.

The clusters of attractions within the traveller activities network vary in size from four attractions to seven attractions. These clusters not only suggest which attractions within Baltimore are most closely aligned, but they can also be used by the DMO for innovative destination design strategies. For example, cluster identification could suggest profitable bundles of destination products and lead to more personalized and effective marketing and sales strategies, such as and the creation of technology mediated visitor recommendation systems (Gretzel et al. 2004). As an illustration, visitors to Ft. McHenry will have a higher probability of also being interesting in visiting the Edgar Allen Poe Gravesite, the Star Spangled Banner Flag House, the Civil War Museum, and Watermark Cruises.

Taken individually, each metric reveals important information about Baltimore's traveller activities network that can be used to make strategic destination design decisions. Importantly, when the metrics are examined together, additional insights can be gained. For example, Table 2 reveals that most clusters have an anchor with high degree centrality and also a boundary spanner with high betweenness. However, several clusters are lacking an anchor, a boundary spanner,

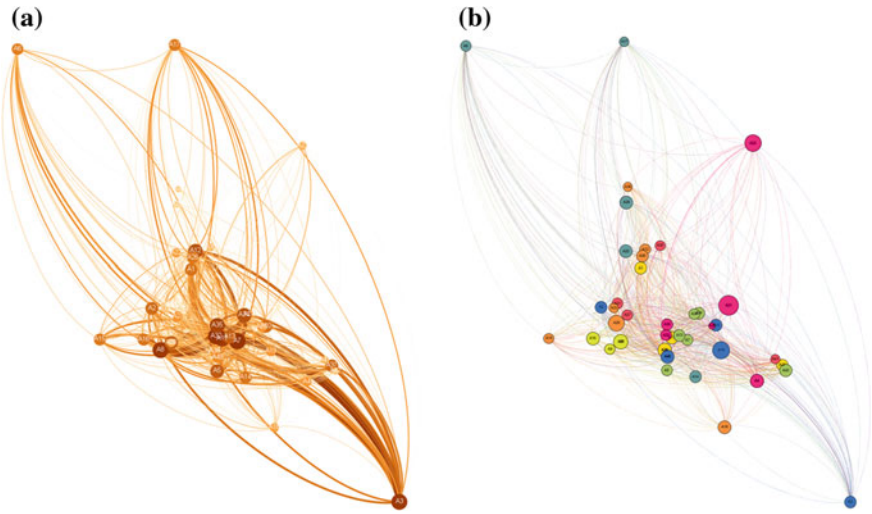

Fig. 1 Visualizations of Baltimore's B2B traveller activities network. **a** Weighted centrality. **b** Network clustering

or both, suggesting that these clusters are more disconnected from they value creation system and that there are opportunities to increase destination performance and competitiveness. Having recognized this, it becomes the responsibility of the DMO as a network manager to work with destination stakeholders to develop the connections needed to create anchors and facilitate boundary spanners in order to increase the competitiveness of the destination.

4.4 Network Visualization

The weighted matrix for the B2B traveller activities network can also be entered into specialized programs such as Gephi 0.8.2 (Bastian et al. 2009) in order to visualize the geospatial connections between nodes and ties. Figure 1a shows the visualization of Baltimore's attractions based on weighted degree centrality, where the locations of the nodes correspond to the latitude and longitude coordinates of attractions and larger and darker nodes have higher weighted degree centrality. Likewise, thicker and darker lines indicate connections with higher weight. Figure 1b shows the visualization of the same network based upon clusters. The size of each node reflects the clustering coefficient of each attraction, and nodes within the same clusters share the same colours.

These visualizations are useful for DMOs interested in designing more competitive destinations. For example, Fig. 1a can be used to easily identify the most common paths between attractions, information which can be used to improve destination infrastructure or strategically locate visitor centres/information kiosks.

Additionally, by seeing how attractions within clusters are dispersed geographically, as shown in Fig. 1b, DMOs could develop tour routes or suggest the ideal location for visitor services tailored for each cluster of attractions, such as souvenir shops and restaurants.

5 Implications

It is argued that the deconstruction of the value creation networks within a tourism destination can inform the DMO of potential gains that can be made through strategic destination design, including the formation of new, innovative, and strategic collaborations. Using Baltimore tourism as a case study, the findings of this study indicate that the destination performance metrics proposed by Stienmetz and Fesenmaier (2013) are useful in identifying important patterns of traveller activities and how these activities may create value. In particular, the centrality metrics based upon the B2B network ties identify which Baltimore attractions are of highest importance for destination value creation in terms of the traveller activities network. Additionally, betweenness metrics have identified which attractions may be called upon by the Baltimore DMO to serve as boundary spanners in order to improve the flow of resources and increase destination competitiveness. Clusters of attractions have been identified which can be used to suggest destination alliances, increase the probability of successful collaboration, and develop innovation marketing and customer relationship programs. Importantly, analysis of the network has also revealed where key relationships among stakeholders are missing that, once developed, could potentially improve destination competitiveness. Finally, ways in which the geospatial visualization of the network can inform the design of a destination where also discussed.

This case study has also set the foundation for future research. Of particular interest are the ways in which new sources of data can be utilized to metricize various elements within the destination value system. Data mining techniques should be developed, for example, to describe the digital paths of travellers as they use Internet technology before, during, and after their destination visits (Gonzalez et al. 2003). In the case of destination value creation networks, travellers engage in numerous forms of social media, some of the most popular being Twitter, Flickr, YouTube, Facebook, and TripAdvisor (U.S. Travel Association 2012). Many of these data created through social media use are publicly accessible, thereby providing an opportunity to analyse destination level data without requiring the sharing of proprietary traveller data held by the individual destination firms; and because much of these data are geocoded, travellers' movement through both physical and virtual space can be better understood. Finally, these data offer the potential to monitor destination network metrics in real time, which in turn, enable DMOs to design destination management strategies that respond to the need of current (and 'real') visitors rather than those 'imagined' by out-of-date surveys.

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Facebook it: Evaluation of Facebook's Search Engine for Travel Related Information Retrieval

Paul Bulencea and Roman Egger

Abstract The internet and its adoption changed the way in which tourists search for information. Due to the high level of information available on the internet, online search has become the major way in which information is accessed. The presence of social media has also strongly modified people's information retrieval behaviour. Various studies state that online social networks represent an important source for holiday planning. This paper attempts to evaluate holiday related information in a scenario where users are only allowed to use Facebook's search engine for finding the necessary information. The results indicate that Facebook delivers relevant information about attractions. However, it provides insufficient information quality for the decision making process concerning transportation and accommodation.

Keywords Facebook search engine · Tourism information · Perceived value · Facebook graph search · Social network · Web 2.0

1 Introduction

Xiang and Gretzel (2010) observed two main internet trends that have a significant impact on tourism. The first trend is represented by the emergence of social media that contains a number of different forms of consumer generated content. The second trend is marked by online search, becoming the leading mode in which

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travellers are using the internet (Egger 2007). This paper focuses on the information found by using search engines of online social networks (OSN). OSN are regarded as important sources for holiday planning (Milano et al. 2011; Xiang and Gretzel 2010). The utilization of OSN for tourism purposes is a relatively new topic (Di Pietro et al. 2011). Of the various OSN available globally, Facebook was selected for the present study, as it is the largest OSN in the world as well as the most used social media platform by Destination Management Organisations (DMOs) (Dwivedi et al. 2012; Hays et al. 2012). According to a study by Skyscanner, 52 % of Facebook users mentioned that seeing their friend's photos on Facebook inspired them to book a trip to that particular destination. The Facebook search engine offers traditional web search as well as social web search (Wittman 2012). The authors did not find any research regarding the use of Facebook's search engine for holiday planning so far. Thus, this article focuses on holiday related information retrieved on Facebook, correspondingly on how users perform a search task, what is the perceived value of the travel related information found and what is Facebook's search engine potential for holiday related information search.

2 Literature Review

2.1 Social Networks and Facebook in the Tourism Context

The most cited definition of OSN identified in the literature (Fotis et al. 2011; Papacharissi 2009) is that by Boyd and Ellison (2007, p. 221), who state that OSN are online services that enable users to create a profile within a defined system where they can develop a list of connections, view and navigate their list and those crated by other users within the system. Within the context of tourism, Di Pietro et al. (2011) state that OSN represent a new platform where tourists can find information that is already available on the social network or in the form of other users' experience that will help them plan a holiday and select a potential destination. Facebook was founded in 2004 and it can be described as a complex social network website that enables users to organise and upload various types of multimedia, join pages or groups, create an in-depth profile and install third-party applications (Hays et al. 2012). By the end of March 2013 Facebook had 1.15 billion users worldwide, with 82 % of users situated outside of U.S. and Canada; out of the 1.15 billion users, 699 million where daily active on average. Dwivedi et al. (2012) specified that out of all the National Tourism Organisations that use social media platforms, 79 %—that is 64 out of 81 countries—use Facebook. They state that at the moment Facebook is thus the most preferred social media platform by National Tourism Organisations. During a pilot study, Page et al. (2012) found out that Facebook and Twitter are the most common platforms where DMOs participate and are active. Moreover, this trend can also be

seen from the users' side, as OSN, especially Facebook, are increasingly being used for travel and tourism purposes (Milano et al. 2011; Di Pietro et al. 2011).

2.2 Search Engine on Facebook

Bearing in mind the observation of an increased trend for tourists to use social networks in regard to travel and tourism (Enter and Michopoulou 2013; Egger 2010; Di Pietro et al. 2011), searching online is becoming one of the main modalities through which tourists achieve information (Milano et al. 2011; Xiang and Gretzel 2010). This leads to the deduction that Facebook can serve as an important source of information for the tourist. Searching on a social network can be interpreted as "social search". There are a variety of definitions and explanations of social search. Some authors state that social search is finding information online by asking friends, reference librarians or unknown persons (Morris et al. 2010a; Evans et al. 2009; Evans and Chi 2008). Morris et al. (2010a) argue that people can also search through already existing social content such as Twitter posts, and that there are also online tools like search engines or Q&A sites to help the user find information. However, this paper does not focus on everything that social search refers to, such as collaborative search, or asking network connections. It focuses solely on Facebook's search engine and the perceived value of the content found. The content found can consist of posts such as proposed by Morris et al. (2010b), pages, public events, places, apps und various other forms. Recently, Facebook focused on emphasising its search engine. In January 2013, Facebook launched the beta version of Graph Search. Graph Search provides all information that is public and shared with a specific user on Facebook (Facebook Help Centre 2012).

2.3 Information Value

For measuring the perceived value of the holiday related information found on Facebook the Information Value Structure Model (IVSM) by Cho and Jang (2008) has been selected. There has been little research done on the perceived information value for vacation travel (Vogt and Fesenmaier 1998; Cho and Jang 2008; Cho and Sung 2012). Nevertheless, following an in-depth literature review, Cho and Jang (2008) developed the IVSM. The IVSM suggests that the perceived information value for vacation travel has five dimensions: utilitarian, risk avoidance, hedonic, sensation seeking and social. This model has a multidimensional approach to the perceived value, which has also been observed by other researchers (Sweeny and Soutar 2001; Vogt and Fesenmeier 1998; Woodruff 1997). Following the empirical research of the model, Cho and Jang (2008) found that information value was best conceptualized as a five dimensions interrelated model. The model has been

Table 1 Information value dimensions (adapted from Cho and Jang 2008)

Utilitarian	Efficient, useful, helpful, informative, beneficial, necessary, valuable, relevant, significant
Risk avoidance	Equipment/functional risk, financial risk, health risk, performance risk, psychological risk, satisfaction risk, social risk, terrorism risk, time risk
Hedonic	Exciting, fantastic, creating a daydream, entertaining, enjoyable, escapism seeking
Sensation seeking	Boredom susceptible, disinhibited, innovative, experience seeking, thrill and adventure seeking, novelty seeking, risk taking, sensation seeking
Social	Advertising my trip to others on vacation matters, interacting with friends/family, being with people who enjoy what I do

applied and validated in further research by Cho and Sung (2012) in evaluating the information value factors in regard with information search on a specific travel destination website in a cross cultural environment (Table 1).

Regarding the expected values of the value dimensions of the content found, Jacobsen and Munar (2012) suggest that the information found on OSN provides more of a hedonic experience and social affirmation while the traditional tourism industry websites are the main providers of product information addressing more the utilitarian dimension of the information value system. Several findings (Lin and Lu 2011; Morris et al. 2010b) also agree that enjoyment is the most powerful factor why people continue to use Facebook, followed by the number of peers (the social dimension) and usefulness (Lin and Lu 2011). Thus it can be expected that the utilitarian dimension of the perceived value model of holiday related information found on Facebook has the lowest value.

2.4 Holiday Related Information

Buhalis (2000) states that most of the touristic destinations are composed of core components that can be categorized in 6 headings called the 6As framework: attractions, accessibility, amenities, available packages, activities, ancillary services. In the context of online information search in the pre-trip phase, Fesenmaier et al. (2011) suggest that information about the following aspects is mostly being searched online first: accommodation = amenities (Buhalis 2000), attractions = attractions (Buhalis 2000) transportation and routes = accessibility (Buhalis 2000). Thus, for this research, Buhalis's (2000) 6A framework will be reduced to a 3A framework (attractions, accessibility and amenities) based on the findings of Fesenmaier et al. (2011).

3 Methodology

For measuring the perceived holiday related information value found on Facebook a scenario in which the people only use Facebook for touristic information search has been developed. It is obvious that currently people will not fully engage in touristic information search just by using Facebook's search engine. However, future developments show (e.g. Facebook Graph Search) that the intention of Facebook is to underline the functionality of the search engine. Therefore, following the literature review, a conceptual model of how Facebook search might be used in a pre-trip phase alongside with the information value dimensions has been developed. The conceptual model was developed to serve as a visual support on how to quantitatively measure the holiday related information in the pre-trip phase. Further, a search task for the respondents was developed. In order to have a higher level of reliability the authors considered to first define a task and test it qualitatively, and then to develop and implement the quantitative research method. Therefore, a search task for the qualitative research was created. The users had to imagine that they have to plan a weekend trip to Dublin for the upcoming weekend, with a budget of 700 euros. Each user had to find information about transportation, accommodation and attractions in Dublin. They were only allowed to use Facebook search. They were not allowed to ask their friends, post messages or leave the Facebook page. For gathering data, a talk-aloud protocol (Ericsson and Simon 1980) and also screen and voice recording, using the Morae 2.0 software, were employed. Before the search task, instructions about the talk-aloud method were provided. No time limit was imposed. After understanding how the search is being performed, what the duration of the search task is and what users think about when searching, a refined search task was defined for the quantitative study.

For the quantitative research, the users had to perform a 15-min Facebook search task and afterwards fill in an online survey. Following the qualitative research it has been found out that users can hardly find information about transportation and that the information regarding accommodation is not enough for them to make a feasible decision. Thus, for the quantitative research, the search task consisted in users imagining that they won a weekend trip to Dublin where the accommodation and transportation had already been already paid and selected. The only task that they had to do was to find two attractions they would like to visit during their stay. In order to create a more realistic scenario they were also asked to focus on finding all the information that they needed in order to plan their itinerary (e.g. price, location, schedule, risks, etc.). The survey was organized into three sections. The first section included demographic information. The second section contained three to four questions for each of the information value dimension. The individuals ranked the information found on a 7-point Likert scale, ranging from 1 = not at all important to 7 = very important. The last part focused on the willingness to use Facebook search for gathering information regarding attractions, as well as on the Facebook time use profile. This section was based on questions developed following the qualitative research.

Table 2 Quantitative research sample

Variables	N = 108	%	Variables	N = 108	%
Gender			*Facebook h/week*		
Male	38	35.2	<1	18	16.7
Female	70	64.8	>1 <3	27	25
Age			>3 <5	27	25
15–19	7	6.5	>5 <7	11	10.2
20–24	61	56.5	>7	25	23.1
25–29	28	25.9	*Facebook visit frequency*		
30–34	10	9.3	More times a day	81	75
35–39	2	1.9	Once a day	13	12
Education			Every 2–3 days	8	7.4
High school	52	48.1	Every 4–7 days	6	5.6
Bachelor	47	43.5			
Master	9	8.3			

Eleven persons (6 female and 5 male), all Facebook users, took part in the qualitative research. 4 out of 11 had already visited Dublin. The persons were selected from the Salzburg University of Applied Science and also from the researchers' own social groups. Most of them were students between the ages of 22 and 30. Eight persons were Austrian, the rest international students.

For the quantitative research, tourism students from the Bachelor and Master Programme of the Salzburg University of Applied Science participated. Emory (1980) mentions, that student samples are especially useful for construct analysis and concept identification. A direct request from the Tourism Programme Office has been made and computer labs have been reserved for the task. A total of 108 persons performed the requested information search task for approximately 15 min each. In order to be able to execute SEM with small a sample size, the authors followed Nevitt's model. Although Bentler and Yaoun (1999) state, that the sample size in SEM can be quite small (especially in applied sciences) and just needs to be slightly larger than the number of parameters estimates, the authors are aware of the fact, that sample sizes larger than 200 are mostly used, in order to deliver acceptable results. Table 2 summarizes the demographic profile of the respondents and also their Facebook visiting frequency.

4 Results

For the qualitative research the results are divided in 3 types of information regarding: *transportation, accommodation*, and *attractions*. Furthermore, each task was separated in two major dimensions: (1) how and where users are searching for information and (2) what happened during the process. In each dimension several

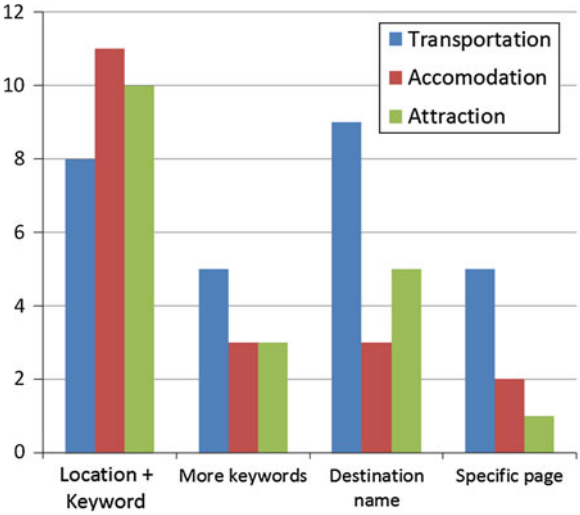

Fig. 1 User search pattern

categories were created by using open coding (Corbin and Strauss 1990). Only the categories that were met more often were taken into consideration.

During the search process different search strategies were identified. Out of these four main categories were distinguished: "Location + keyword" (e.g. *Dublin airport/hotel/flights,* etc.), "More keywords" (e.g. *cheap flights/things to see in Dublin,* etc.), "Destination name" (*Dublin*), "Specific page" (e.g. *Lufthansa, Ryan Air, Tripadvisor,* etc.). Due to the fact that neither of the participants had used the Facebook search engine for such a task before, each used a trial and error method in order to understand and learn how the Facebook search engine works. Thus, each person used various strategies in order to find the information. Several errors were identified, such as pressing the Enter button and going to the first result by accident for several times, and using a search with the help of more keywords. However, two major search strategies were observed. Almost all of the participants used "Location + keyword" when searching for any of the tasks, and the destination name itself was also dominant. Based on this it could be argued that participants mostly used these two methods. During the qualitative research it was noticed that the task took too much time, as the users first had to learn and understand how to use the Facebook search, and as in some cases it was also difficult to find the information they were looking for. The time that users took to fulfil the tasks ranged from 5 to 28 min. During this time all of the 11 participants were unable to find the information they needed in order to reach Dublin (Fig. 1). Also, many users expressed that they wanted to exit Facebook and find this type of information elsewhere, and some even clicked on external links without even noticing that they were exiting Facebook. The high number of people looking for a specific page in transportation (Fig. 2) is related to the fact that users tried to find a specific airline page (e.g. Lufthansa) and then search for the flight.

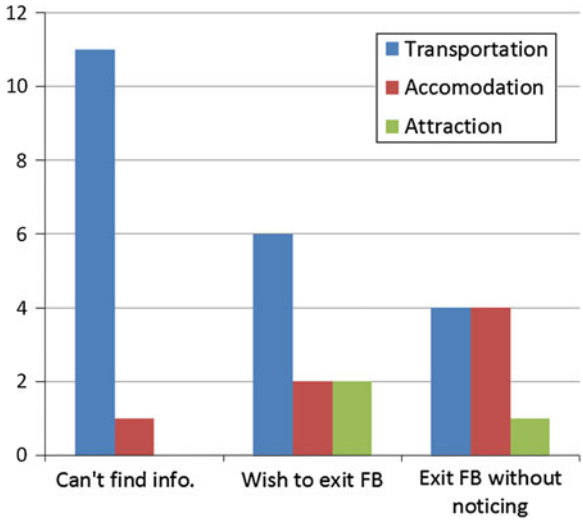

Fig. 2 Search outcome

Regarding accommodation, almost all of the participants were able to find information. However, it was noticed that all participants selected a random hotel just to finish the task. There was no realistic approach for hotel searching. Concerning the attractions, participants took a more personal approach to finding an attraction that suited them. Hence, a more realistic approach to the task was taken. For this task all users could find information. Regarding the content, all people focused on searching on Facebook "pages", and 7 out of 11 were browsing on the Facebook destination page (named "places" in the scheme, it is not the page of the Tourism Board but the one offered by Facebook). One person looked in groups, one person tried apps (unsuccessfully, as the apps did not work), and only two persons briefly used the search category (places, pages, public posts and events) after pressing "show more results". Therefore, Facebook Pages and Places were the areas where users were looking for information. The results show that even though several strategies for finding information were used by the test subjects, a clear pattern has been observed with two major strategies being used. Moreover, the results regarding the use of destination-oriented keywords as a main search strategy are also in agreement with the findings of Fesenmaier et al.

Even though throughout the literature review the importance of the social information has been highly emphasised, during the qualitative research only few people took the time and analysed the social information provided by other people. Based on this it can be suggested that even if there is a high level of social information available, if the basic utilitarian needs are not satisfied, people tend not to analyse the social information available and look for the information elsewhere.

Following the qualitative study, the conceptual model for measuring the information value was refined (Fig. 3). The qualitative study suggested that people are using two main search strategies (typing either the location name with a

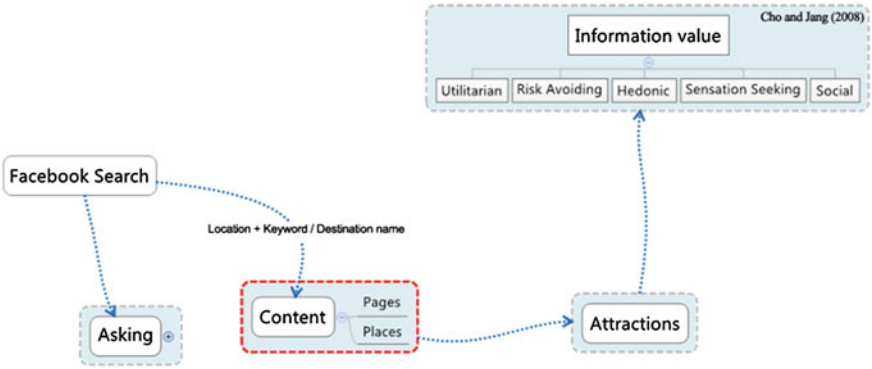

Fig. 3 Facebook search engine evaluation model

keyword or typing in the destination name). The users were looking mostly on the information found on Facebook pages or Facebook places. The data also suggests that information about transportation to a destination can hardly be found and that making a decision regarding accommodation based on the information found on Facebook is not desirable. However, the users seemed to take more time and explore the content more when having to find an attraction that they were going to visit. To test if the IVSM of Cho and Jang (2008) holds, a confirmatory factor analysis (CFA) using the AMOS software (version 21) has been performed (Table 3). For the CFA the missing data was dropped listwise and some data was found to be randomly missing. Following the listwise reduction, a sample of 92 respondents was used for the CFA. Also, in order to see if the measurement items correspond, with the information value dimensions, a reliability alpha test was also performed. The proposed minimum of 0.7 (Nunnally 1978) was exceeded by all alphas.

Accordingly, the results point out that the measurement items used are reliable for measuring each value dimension. For the CFA the Chi square test of the measurement model was statistically significant ($X^2 = 129.116$, $df = 94$, $p < 0.05$). However, the suitability of testing the model fit by using the Chi square test is frequently questioned (Bollen and Long 1993). Furthermore, when small samples are used, the Chi square test does not have power and cannot distinguish between good fitting models and poor fitting models (Kenny and McCoach 2003 as cited in Hooper et al. 2008). The RMSEA value is 0.064 and it is seen as an acceptable value for the model fit as recently a limit close to 0.06 (Hu and Bentler 1999, as cited in Hooper et al. 2008) or a strict upper limit of 0.07 (Steiger 2007 as cited in Hooper et al. 2008) seem to be accepted by literature in the model fit area. The normed fit index (NFI) = 0.84 does not reach the threshold of 0.95 (Hu and Bentler 1999, as cited in Hooper et al. 2008). However, a major disadvantage of this index is that it is very sensitive to the sample size, especially miscalculating samples that are smaller than 200 respondents (Mulaik et al. 1989; Bentler 1990 as cited in Hooper et al. 2008). Thus, the comparative fit index (CFI) has been taken

Table 3 Information value structure results (adapted from Cho and Jang 2008)

	Factor loading	Reliability alpha	AVE
Utilitarian		0.853	0.821
Relevant details about the attractions	0.781		
Helpful in making choices about the attractions	0.884		
Useful in helping plan your weekend trip	0.799		
Risk Avoidance		0.782	0.697
Provide facts about performance risks	0.602		
Provide facts about situational risks	0.694		
Provide facts about financial risks	0.722		
Provide facts about physical risks	0.773		
Hedonic		0.820	
Enhance excitement about travelling	0.721		0.800
Create a daydream about visiting attractions	0.827		
Contribute to fantasies about vacation travel	0.852		
Sensation seeking		0.792	0.698
Facts about new adventures	0.774		
Facts about thrill activities	0.768		
Facts about unfamiliar or novel experiences	0.647		
Facts about sensational activities that you might not participate at home	0.606		
Social		0.837	0.869
Help discuss vacation travel with other people	0.825		
Exchange opinions with friends or family about the planned vacation	0.914		

into consideration. It is a reviewed form of the NFI that takes into consideration the sample size (Byrne 1998 as cited in Hooper et al. 2008) and operates well even when the sample size is small (Tabachnick and Fidell 2007 as cited in Hooper et al. 2008). The CFI = 0.949 which is exceptionally close to the 0.95 is recognised as indicative of good fit (Hu and Bentler 1999 as cited in Hooper et al. 2008). Generally, the data presented appears to fit the model from Cho and Jang (2008).

To generate the perceived value scores, a sum score of all observed variables for each latent dimension has been realised (Fig. 4). Then, the sum of each latent variable has been divided by the number of the observed variables. Due to the fact that all the observed variables have the same scale, the results can be interpreted along the scale of the observed variables. The results show that the utilitarian dimension is not as low as expected. The social and hedonic dimensions of information were expected to be the highest on a social network (Jacobsen and Munar 2012; Lin and Lu 2011). Even though both the hedonic and the social dimension have a higher value, the difference is significant only in the case of the

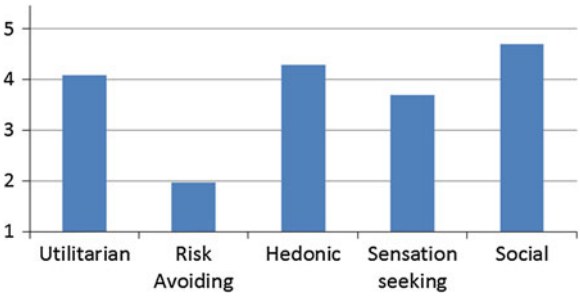

Fig. 4 Perceived value dimensions scores

social dimension. The hedonic and utilitarian have very close mean values. However, when taking the holiday related information as a whole, together with transportation and accessibility different results might occur. In the qualitative study for transportation, for example, no user could find any utilitarian information. Concerning the amenities, content exists but from judging from the observations in the qualitative research, there is not enough information provided in order to make a relevant decision. Bearing in mind that the utilitarian dimension is being considered as the most important information dimension in regard to holiday planning, it could be said that there is a clear lack of the necessary content for holiday planning for this aspect.

In order to evaluate the potential of Facebook as a search engine for holiday planning, several questions were addressed in the quantitative study. The results indicate that finding information about attractions on Facebook is seen as being challenging and sometimes as being a waste of time. With the current search engine and available content, the results show a low user desire to engage in using the Facebook search engine in real holiday planning regarding attractions. 81.5 % of the participants related that one would rather look for attractions on other websites and then use Facebook to find out more information about them. The results mentioned above can be partly explained by the fact that no utilitarian information can be found and thus, that as long as the basic utilitarian information is missing, the social information is of low use. No real overview of the attractions can be found, and some attraction pages might miss relevant utilitarian data. The lack of utilitarian information might also explain the high scores in the following variables: need to exit Facebook, waste of time, level of challenge, and the low desire of engaging in using Facebook search for finding information in a real scenario. However, regarding the potential of the Facebook search engine for attractions, the results show that the respondents are open and would engage in using the Facebook search engine if a specific search tool for attractions would be developed. The results show that at least for attractions there is a big potential for development.

5 Limitations, Discussion and Conclusion

People who are planning a holiday are very sensitive when acquiring the necessary information (Snepenger and Snepenger 1993). Therefore, the data can have a bias because the participants had to imagine that they are going there. The sample is also not representative; it was selected based on the convenience criteria. Thus, the results cannot be generalised. The rapid development of the Facebook search engine itself can be seen as a limitation. By the end of the research (January 2013), Facebook developed the Graph Search. Therefore, further research needs to be done to evaluate the information found by using the new search engine which, at the moment, is still in its beta version. Due to time restrictions the current research could only focus on attractions. Therefore, the authors could not measure the perceived value and the willingness of users to engage with searching information for amenities and accessibility. Further research in this direction is advised.

From a managerial point of view the results suggest that satisfying the basic information needs is essential so that the users can focus on the social information found. The users in the qualitative study repeatedly expressed their wish to exit Facebook in order to find the utilitarian information value that they needed. A clear communication or a better system of how search on Facebook operates should be developed. All the users in the qualitative study used a trial and error approach in order to understand how search works. As searching information about accommodation and transportation seems not to be feasible, finding information about attractions seemed to attract the interest of the users even though they were not actually planning a real holiday. The results of the applied mixed method approach suggest that Facebook has a big potential for becoming a search engine for attractions. From a theoretical point of view the study shows that the IVSM of Cho and Jang (2008) can also be used, with a small adaptation, in a social network context. The data can be further measured with the new Facebook search engine, Facebook Graph Search, to see if improvements to the information value have been made. With the promotion of the new Facebook Graph search it can be interpreted that the users have a clearer understanding of how to search on Facebook. The results from the qualitative research in this study can be further compared with a future study on the Graph Search to see if the search strategies and results differ. Therefore it can be stated that the current study presented a model and methods of how the analysis of the information value in a social network can be further evaluated. The results also stand as a point of reference of how search was performed and how valuable the information found regarding attractions was before Facebook Graph Search was released.

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A Literature Framework Analysis of Online Hotel Accommodation Process Factors

Manus Ward and Mathew Shafaghi

Abstract The Internet is rapidly becoming the dominant user decision making tool for the hotel accommodation purchase process. This paper critically reviews online hotel accommodation purchase processes literature and proposes a literature framework analysis of online hotel accommodation process factors. The objective of this research is to propose a statistically based framework based on clickstream/log file analytics of both the internal and external influencers of the process. The internal process influencers (the individual themselves, search engines, third parties/social media sites and hotel websites) and the external process influencers (online access devices and user visual interaction) are reviewed before being formulated into proposed framework of the online hotel accommodation process.

Keywords Hotel accommodation booking process · Online search · Social media · Online purchase process · Analytics · Devices

1 Introduction

Global hotel accommodation sales are estimated at US $789bn (Ward 2013) and the Internet is rapidly becoming the dominant user decision making tool for the hotel accommodation purchase process. The aim of this paper is to critically review users' online hotel accommodation processes literature and subsequently map standardised behavioural patterns noted during the process. The objective of this research is to propose a statistically based framework based on clickstream/log

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file analytics of both the internal and external influencers of the process. The internal process influencers (the individual themselves, search engines, third parties/social media sites and hotel websites) and the external process influencers (online access devices and user visual interaction) are reviewed before being formulated into proposed online hotel accommodation process framework.

2 Theoretical Background

2.1 Clickstream/Log File Analytics of the Process

Bucklin and Sismeiro (2009) describe clickstream data as the electronic record of a user's activity on the Internet. It provides information about the sequence of pages or the path viewed by users as they navigate a web site (Montgomery et al. 2004). Click stream data however is essentially useless to us in its raw coded format. This raw data is converted by log file analysis tools, which compile raw data into human understandable reports (Ramey 2000). Click stream data has major advantages to identify user behaviour in analysing the online hotel accommodation process. They are a valuable cornerstone for continuous website design (Burton and Walther 2001; Giudici 2003; Murphy et al. 2001; Xue 2004). The clinical statistical nature of the data removes the bias of self-reported data. One of the most promising applications is in identifying homogenous user subgroups (Liu 2008); this allows marketers to target specific demographics more likely to purchase hotel accommodation.

Clickstream data presents us with vast amounts of incredibly useful information. However, it is not without its difficulties or limitations. Bucklin et al. (2002) found that marketers lack a methodology for analysing path information. Limitations exist when analysing specific devices. Take for example a user in an Internet café who accesses a particular site, later another person sits at the same computer and accesses the same site differently (Hofacker and Murphy 2005). In examining the limitations of interpreting log files Schegg et al. (2005) asked if a user requesting many resources on a hotel website indicates an interesting website or the user fails to find information. Standard analytics tools (e.g., Google Analytics or 123loganalyzer) provide solely descriptive information about page access frequencies, view times, common entry and exit points, referral sites, etc. and thus provide a blurred and incomplete picture of online behaviour. Schegg et al. (2005) recommended combining the path analysis with user observations (i.e., by video and screen cameras and user surveys) to shed more light on how to convert these visitors from lookers to bookers. Clickstream/log file analytics provide a statistical foundation for further research into the human thought process and the emotional influences on the Process Influencing Factors.

2.2 Process Influences (Internal)

The Individual Consumers have in recent years increasingly relied on the online medium for the travel research process. Starkov and Safer (2010) found that 94 % of travellers were accessing hotel information online and 55 % of all leisure and business travel bookings will be completed online. This is significant in that it infers that 39 % will search online then will choose to leave the online medium to purchase travel offline. This online/offline behaviour is extremely difficult to map given that it is almost impossible to track which other method was used by the online searcher to subsequently book the hotel room. Seabra et al. (2007) found that tourists mix the Internet and other non-internet information sources, including commercial brochures and travel agents for planning trips. iProspect (2009) found that 67 % of online users are driven to search following exposure to an offline channel and that 39 % ultimately convert back, purchasing from the company that caused them to launch their search.

Pitman et al. (2010) found in examining the range of search terms being used to book tourism products, that only 12 % related to accommodation finding that the distribution of search terms could be summarised as follows: accommodation (12 %), activities (16 %), skiing (7 %), dining (7 %), shopping (3 %), attractions (7 %) and services (17 %), together with nonspecific terms (32 %). This is significant in that it indicates that 88 % of travel search terms are non accommodation-based and that the hotel accommodation selection process is heavily reliant on non hotel search terms.

Gretzel et al. (2007) found that it is a staged process with most respondents planning major aspects of their trip in advance (67 %). Fesenmaier and Jeng (2000) supports this finding that travel is a staged process and that different decisions are made at different stages of the process. They propose three basic decision phases in the tourism travel decision making process: (1) core decisions, which are planned in detail well in advance of the trip; (2) secondary decisions, considered prior to the trip but "flexible" to accommodate the possibility of change; and (3) en route decisions, not considered until the traveller is actually en route and actively seeking alternatives. Decisions made at a later stage appear to be conditional on decisions made earlier.

Sumi and Kabir (2010) found that the buying process starts long before the actual purchase and has consequences long afterward. Gretzel et al. (2007) supports this, finding that 44.2 % of their survey respondents began their trip planning four or more months in advance, 29.5 % plan 2–4 months in advance, 20.3 % plan 3–8 weeks in advance and 1.3 % plan 1–6 days in advance. Only 0.4 % made travel decisions during their trip. ComScore and Google (2008) support this for the online stage of the process finding that on average, customers in the UK make 12 travel related searches, visiting 22 websites and taking 29 days from the first time they search until they make a purchase. Ho et al. (2012) found on average that the total search time for an individual online session was only around 30 min. Jansen et al. (2008) found in an examination of web queries that consumers were seeking

information 80.6 % of the time, navigating between pages 10.2 % of the time and carrying out transactions 9.2 % of the time. This somewhat explains extremely low purchase completion rates.

Early research was very concerned about these rates. New York Times (2000) found that online retailers such as Amazon.com, Macys.com, JCPenney.com, and MarthaStewart.com had purchase conversion rates that ranged between 1 and 2 % averaging 1.8 %. Moe (2003) supported this in her 2003 research finding a 1.25 % purchase conversion rate and Sismeiro and Bucklin (2004) only a year later found that the clickstream data showed that only about 2 % of site visitors completed an order transaction. Purchase click out rates of this nature clearly need further analysis as a generalisation of the process would imply a no purchase click out. Expedia.com (2013) found that a typical online advertisement has a 0.14 % click through rate, that is for every 714 times an advertisement is displayed, a user will click on one.

These very low statistical rates have severe limitations in that they do not explain the behaviour of users, but more in-depth analysis shows interesting behavioural traits behind these statistics. Moe (2003) found that very few purchases occurred in the beginning of the data period as compared to the latter half of the data. Moe (2003) and Putsis and Srinivasan (1994) have shown that in many cases, consumers build up to a purchase, in other words, consumers will make a series of non purchase visits before making a purchase visit with late stage visits having the highest purchase conversion rate of 20 %. There is limited research on the decision making process link between the online medium and the offline purchase process. Starkov (2012b) found that after examining web and call analytics, that 60–70 % of mobile hotel bookings are made via voice reservations clicked directly from the phone number on the mobile site.

Search Engines The Travel Industry Association of America and others have shown that the majority of U.S. travellers use search engines for vacation planning (Fesenmaier and Cook 2009). In fact in 2012, Pollard (2012) stated that all travellers use search engines to get information. It has been noted that even with newer offerings such as news, image, video, and scholarly document searches, which come from specialised web crawls, the core of search engines remains the search index (Höchstötter and Lewandowski 2009). Most frequently, participants would visit one site, that is to say the first hit (81 %), or at most two sites (13 %) listed among the results. Lee (2013) also noted the vast majority of searchers only check the first page of search engine results. Schegg et al. (2005) noted in an analysis of search engine referrals that Google was the most popular search engine (61 %).

Starkov (2013) noted that over 55.6 % of website booking revenue came as a direct referral from search engines in 2012, including organic (32.7 %) and paid search (22.9 %). The amount of bookings through organic search may change into the future as Machill et al. (2004) found that online searchers are very averse to paying for online search. Xiang et al. (2008) noted that the top tourism related keywords inputted into search engines for Chicago were in the following areas: accommodation, activities, areas, attractions, events, information, places,

restaurants and shopping. Studies by Pan et al. (2007) and Hwang et al. (2009) indicate that searchers usually focus on cities as the geographical boundary instead of states or countries.

Chitika Insights (2012) noted that the average number of keywords had increased over time from 1.2 words in 1998 to 4.39 in 2012 over the five largest search engines. Searches as extensive as a hotel accommodation search are rarely completed in a single search. Yang et al. (2007) noted that because search accuracy largely depends on the quality of search keywords, users seldom use the right search keywords on their first search. ComScore and Google (2008) not only noted that travel consumers are using search engines in more sophisticated ways to research and purchase travel in the UK, but that on average consumers take nearly a month to go from their first search to a purchase, making 12 travel related searches, 22 website visits and take 29 days from the first time they search until they make a purchase. They also found that 45 % of transactions occur 4 weeks or more after the first search. Online hotel accommodation purchase is not a single visit purchase and we must alter the way we attempt to map consumer behaviour. McCarthy et al. (2010) noted that while the hotel brand website had the largest amount of final stage respondent visits, search engines had over three times as many early stage visits as the hotel in the final stage.

Third Parties/Social Media Third party media on the Internet are referred to using various names. Litvin et al. (2008) define electronic word of mouth (eWOM) as all informal communications directed at consumers through Internet based technology related to the usage or characteristics of particular goods and services, or their sellers. Daugherty et al. (2008) define user-generated content (UGC) as media content created or produced by the general public rather than by paid professionals and primarily distributed on the Internet. Online consumer reviews about travel destinations, hotels, and tourism services have become extremely important sources of information for travellers (Pan et al. 2007). This is because the influence of online consumer reviews is particularly strong for experience products such as the hospitality and tourism industries (Zhang et al. 2010). Ye et al. (2011) found this is because the intangible nature of tourism products makes it difficult to evaluate before consumption, and it has long been recognised that interpersonal communications are an important information source among tourists (Litvin et al. 2008).

Social Media, however, has significant limitations, which limit our ability to map their effect onto the online hotel accommodation process. Bucklin and Sismeiro (2009) noted that the challenges in using clickstream data to study eWOM can be significant. It is very difficult to track eWOM and can be even harder to connect it to consumer transactions or other behaviour. Sex is another limitation; McCarthy et al. (2010) noted that females are more likely than men to post negative reviews after negative experiences positive reviews following positive experiences. Indeed, women behave differently to men when using social media to review the same hotel products.

The purchase of hotel accommodation is now inexorably linked to online third parties and has been for some time. Tedeschi (2006) noted that in general, more and more consumers use infomediaries. Gretzel et al. (2007) noted that 92.3 % use virtual communities (TripAdvisor, VirtualTourist, LonelyPlanet, etc.) to find other travellers' online reviews. Lee and Tussyadiah (2010) noted that a reasonably significant number of travellers are starting to leave comments on social media. 27.1 % of participants indicated that they have engaged in eWOM about their travel experiences. Their reviews are critically important for hotel accommodation providers as 77.9 % of online travel review readers think that other travellers' reviews are extremely or very important for determining where to stay with all other travel decisions being seen as much less important; where to eat (33.6 %), what to do (32.5 %), where to go (27.0 %).

Gretzel et al. (2007) noted that of those who read other travellers' online reviews, a majority (63.7 %) read them in the beginning of the trip planning process to get ideas and 64.7 % in the middle of planning to narrow down choices. 40.8 % of respondents also use online reviews later in their planning, in order to confirm their decisions. Ye et al. (2009) noted that a 10 % improvement in reviewers' rating can increase sales by 4.4 % and a 10 % increase in review variance can decrease sales by 2.8 %. Reviews related to, the GDP of the city had a positive impact on booking numbers. ComScore and The Kelsey Group (2007) noted that 40 % of hotel reviewers subsequently purchased a hotel room and 87 % said it had a significant influence on their purchase.

Hotel Websites Mapping the hotel website search is not just important from a provision of the online patterns of hotel accommodation searchers. Talón-Ballestero and González-Serrano (2013) noted that 99 % of hotels allow online reservations, yet Walker (2012) noted in 2011 that 76 % of online bookings for non-branded hotels came from online travel agencies (OTAs) and just 24 % of online bookings came from the hotels' own website. This is a huge issue because travel intermediaries' commission rates are between 18 and 30 % (Starkov and Price 2005). Morosan and Jeong (2008) found that users overall have a more favourable attitude and higher intentions to revisit third-party web sites than hotel owned web sites yet there is a large increase in the number of users who book directly on hotel websites (Jeong et al. 2003). However, all the research viewed in this area had some limitations.

Schegg et al. (2005) while noting the keywords entered into search engines to find hotels, noted stark differences between individual hotels. Examples included where the name of one hotel was inputted into a search engine in 4 % of their searches yet in another hotel it was in 86 % of their searches. Schegg et al. (2005) found in researching hotel website visits that the median visit length ranged from 60 to 172 s, and the average visitor across all hotels stayed almost 2 min. During their visits web surfers requested between 1.6 and 11.7 web pages, depending on the hotel, with an overall average of 4.7 pages. These results are supported by Jones and Chen (2011) who found that a user spends 92 s investigating a hotel. Jones and Chen (2011) noted that prior to landing on a hotel's website, subjects

entered the destination, travel date and the numbers of travellers. The subjects were then provided with on average 194.8 hotels. From this consideration set, the subjects only considered in detail an average of 4.1 hotels before choosing their hotel. Every tenth visitors opens a page and exits without viewing another page. In 56 % of one page visits the visitors land and leave from the site's home page. Without researching the human thought process we cannot optimise the process for individual consumers.

2.3 Process Influences (External)

Online Access Devices The interface mechanism for hotel accommodation booking has changed dramatically in recent years. Google (2012) found that consumers on average spend 4.4 h of their leisure time daily in front of screens. PCs/laptops have been and still are the main online interaction device. Sterling (2011) noted that in the second quarter of 2011, 90 % of mainly US and UK Internet users stated they owned a laptop. This dramatically dropped in just one quarter to 79 % with 62 % stated they owned a smartphone with a large increase in tablet ownership from 32 to 37 %. Google (2012) found that the average per interaction on each device was TV 43 min, PC/Laptop 39 min, Tablet 30 min and Smartphone 17 min.

Devises are central to the when and where usage patterns of consumers. Google (2012) found that, for example, PCs are used mostly as a work device for productivity and smartphones/tablets are used mostly as a leisure device out of work. Many major hotel brands report that 80 % or more of their mobile bookings are for the same or following day. Tracking this usage for the purpose of hotel accommodation sales is far from straightforward. Google (2012) reported that 90 % of consumers use multiple screens sequentially to accomplish a task over time; 98 % move between devices on the same day. About 43 % of people sequentially moving between devices have used them to plan a trip. Van Theil (2013) reported that 39 % of UK consumers who researched a product using their smartphone purchased the product on a desktop/tablet and Starkov and Safer (2013) found that 60–70 % of mobile bookings actually happen by voice made via the mobile website. The devices people use simultaneously are smartphone and TV 81 %, smartphone and laptop/PC 66 % and laptop/PC and TV 66 %. About 22 % of simultaneous usage is complimentary, such as see a hotel on screen and look it up on the smartphone (Google 2012).

Starkov (2012a) found that 1.11 % of hotel revenue is generated on smartphones, 5.84 % on tablets but the vast majority 93.06 % is generated on desktop/laptops. This cannot simply be dismissed as delayed new technology adoption as tablets have significantly higher hotel accommodation bookings and are a much newer technology. eMarketer (2013) noted that while travel accounted for 1 % of internet usage in the USA in 2012, it accounted for 9.3 % of mobile internet for

Q.1 2013 suggesting mobile internet is to search and PC/laptop is to purchase. Different devices are starting to significantly impact the online hotel booking process. Starkov and Safer (2013) reported that in 2012 overall Google hotel searches increased by 24 %, mobile device searches increased by 120 % and tablet searches increased by a huge 306 %. Starkov (2012b) estimate mobile online travel bookings will be US $8Bn (6.5 % of total) in 2013 up from US $2.8Bn (2.4 % of total) in 2011 and US$160Bn in 2010. The mobile market is undoubtedly an area to target however it does present significant issues. Expedia and Comscore (2012) found that PCs have a 77 % travel booking conversion rate; this drops to 34 % for tablets and 28 % for smartphones.

Chan (2012) found that since the adoption of smartphone technology is relatively new, a limited amount of academic literature is available on mobile adoption within the hotel industry. The general requirement to input a credit card number is also impeding mobile reservations as almost half (49 %) of online leisure travellers who use mobile phones are either very or somewhat uncomfortable making mobile purchases that require them to enter their credit or debit card number (PhoCusWright 2012). Screen size is also frequently criticised. Trying to squeeze a "desktop" hotel website onto the tiny screen of a mobile device is a futile exercise that inevitably destroys usability and conversion rates (PhoCusWright 2012). Without researching the human thought process behind the device usage in this section it is impossible to adapt devices to fully meet hotel accommodation consumers' requirements.

Visual Interaction The online tourism information search may be viewed as the interaction between information seekers and the online system (Ho et al. 2012). The actual user online tourism information exchange process is in the main conducted visually. Meeker and Wu (2013) found that while initially websites were predominantly textual in nature, the use of images in websites and social media had increased dramatically. Nowadays other media such as movies are important and their percentage of the web index is increasing rapidly (Höchstötter and Lewandowski 2009). Kanellopoulos (2010) noted that in multimedia applications, text offers clarity and self-pacing, graphics provide visualisation and communicate styles and video captures the moving events of the world around us. Lee and Tussyadiah (2010), however, noted that text and photos and text-only contribute 70.6 and 14.7 % respectively of the information contributed to the searcher. Text and video and video-only both combined represented 8.6 % of information searched, but respondents considered it offered only 1.8 % of the information contributed. Mane et al. (2013) noted that video as a portion of total Internet usage is increasing. In 2010 it was 7 %, 2011 it was 10 % and in 2012 it was 13 % or 24 min per person per day.

Eye tracking technology allows knowing what a person looks at as a function of time (Ali-Hasan et al. 2008). A limitation Velásquez (2013) noted with eye tracking, however, is that it only determines what a person looks at and nor if what is observed is liked or disliked. Breeze (2009) and Maughan (2009) in examining eye gaze locations found that consumers automatically focus on the eyes of people

in advertisements and fail to view the central message of the ad. Maughan (2009) noted an increase in consumers' views of the product from 6 to 84 % by photoshopping the models eye direction to the side of one product. Bunnyfoot.com (2013) noted however that in goal driven websites, consumers are drawn to the text most closely associated with their goal and do not view the eyes of the model in the picture. An example noted was Linkedin where the job title received the most attention.

Höchstötter and Lewandowski (2009) noted in search engines that 80.3 % of consumers spend their time "above the fold" (i.e., they only view the area that they need to scroll down to) 19.7 % of the time. Enquiro Search Solutions Inc. (2005) noted that consumers focus the bulk of their attention in a triangular area on the top left of each screen. This research inputted the words "hotels" and "Dublin" together into the five main search engines. AOL had no organic search results whatsoever above the fold followed by Google and Ask.com who had almost none. Bing and Yahoo had two and one and a half results respectively. All search engines had extensive paid hotel advertisement above the fold. Usercentric (2009) also noted that the major search engines had become so similar that their eye gaze patters had become almost identical. González-Caro and Marcos (2011) found that the first ranking position in search engines always collects the highest fraction of visual attention. Höchstötter and Lewandowski (2009) noted that the number of results shown on the "above the fold" screen for the exact same website depends on the screen and browser window size, respectively. González-Caro and Marcos (2011) also found significant differences in eye gaze duration depending on if a user was performing an informational, navigational or transactional type task at the time and if the viewed location was organic or sponsored/paid. Maughan (2008) also found that between 2005 and 2008 users changed their eye gaze pattern for the same site. Thus, eye-tracking data clearly needs vast additional information including the human thought process in order to explain the online behaviour of users (Fig. 1).

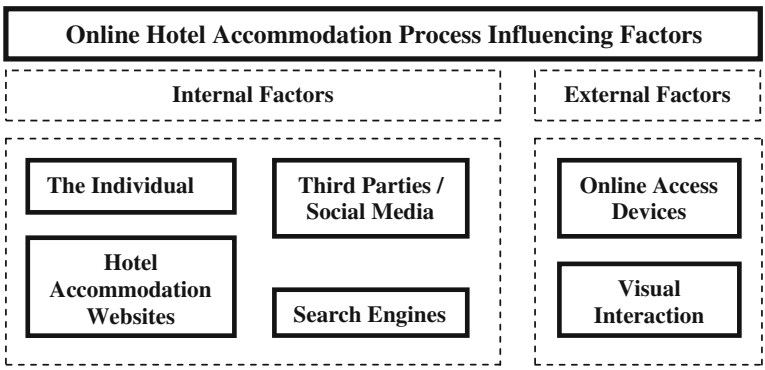

Fig. 1 Online hotel accommodation process influencing factors

3 Conclusion

The Internet has become the dominant interface between hotel accommodation providers and consumers. Consumers who may not use the Internet for the purchase booking stage of the process will use it for other decision making stages of the process. The theoretical and practical contribution to research offered by this paper is to provide a statistically based framework analysis of the online hotel accommodation process factors upon which future research will examine the human thought process and emotional influences on the process. This will in turn provide a basis for online hotel accommodation strategies for accommodation providers. The literature framework provides a structure of the online hotel accommodation purchase process factors. This framework has limitations, as the proposed map is literature based and has not been validated or generalised through primary research. However, once validated and generalised it will provide a valuable basis for future research.

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Part VII
Gaming, Gamification and Smart Tourism

Pervasive Augmented Reality Games to Experience Tourism Destinations

María Teresa Linaza, Aitor Gutierrez and Ander García

Abstract This paper describes the *ExCORA* pervasive game, a mobile experience that aims to engage general public with the Urgull Mountain in San Sebastian, Spain. The game tries to encourage people to visit and explore the natural environment, as well as educate visitors who may visit the mountain, but have no idea of its hidden history. The project explores how pervasive augmented reality games can be used to deliver an engaging tourism experience. The game aims to provide a fun and interactive way to guide participants through different Points of Interest (PoIs), let participants search for unique QR codes to unlock clues and solve mini-games, and augment some objects and PoIs. This paper outlines the design and initial deployment of the game, reporting on the results from a preliminary usability study and discussing initial observations made by visitors.

Keywords ICT enabled experiences · Information interfaces and presentation · Mobile services

1 Introduction

Tourists often want to visit specific or thematic Points of Interests (PoIs) such as historical buildings, unique landscapes or even haunted places. Location-based games can be a way of experiencing those PoIs in an interesting way. In such

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games, tourists will not only follow a list of recommendations given by a mobile application, but also learn something about their environment by solving mini-games related to their experience.

During recent years, there has been a growing technological trend towards pervasive games, which bring more physical movement and interaction into the game world. Pervasive gaming can be considered a current hot topic, although it is often used as a buzzword, and it could mean different things to different people. Nowadays, location-based tourism experiences and pervasive games, where the spatial movement of the player in the physical world is a key element, have increasingly become a research focus. This has been possible due to the expansion of smartphones with Internet, GPS and other sensing capabilities, making mobile phone-based games easy to play and more interesting.

Furthermore, the development of augmented reality (AR) technology allows users to see the real world and perceive an additional virtual world superimposed on the same field of view in real-time. With AR, users feel that the real and virtual objects coexist in the same space. Until recently, AR applications required custom designed equipment, which made it unfeasible in terms of size and cost. However, the development of mobile devices, along with location and visualization technologies, has made it possible to integrate all the components needed by AR applications on smartphones at a low price.

This research aims at implementing a pervasive game for tourists during their visit to some of the most representative PoIs in the city of San Sebastian, Spain. The main goal of *ExCORA* is the development of collaborative and multiuser pervasive AR games in open environments. Such experiences will combine different basic elements called mini-games, which represent a specific activity (e.g., augmented game, insertion of virtual objects in patterns, collaborative augmented activity, etc.) related to the corresponding PoIs.

This paper is organized as follows. Section 2 presents a brief state of the art focused on pervasive games and pervasive AR games with a special focus on the tourism sector. Section 3 describes the *ExCORA* game, while Sect. 4 introduces details about its implementation. Section 5 presents the results of the initial validation of the game. Finally, Sect. 6 summarizes the conclusions and proposes some future work.

2 State of the Art

A tourist destination is an extremely rich source of information, supplying tourists at each moment with a continuous flow of images, sounds, and feelings that cannot be fully simulated by computers. Such environment can be further enhanced by the use of AR technologies. In this context, pervasive games such as *ExCORA* aim at exploiting the richness of the tourism destination as a resource for play. This section describes briefly the relevant concepts and existing examples of the application of pervasive games and AR experiences in the tourism domain.

2.1 Pervasive Games

The exponential growth of mobile computing in terms of technologies, devices and use has allowed the emergence of pervasive games genre. Away from the traditional static games based on consoles and large screens, such games extend the gaming experience by combining the virtual playing field of traditional electronic games with the physical and social aspects of the real world (Magenkurth et al. 2005). Another way to put it is to say that pervasive games extend the gaming experience out into the real world, where the game player becomes unchained from the console and experiences a game that is interwoven with the real world and potentially available at any place and at any time (Benford et al. 2005).

There is currently little agreement on a definitive description of pervasive games, as some of the approaches focus on the game play elements and how the games relate to the everyday life, while others remark the technological aspects that are used for the implementation of the games. This is illustrated by the lack of a common definition as noted by Nieuwdorp (2007), who provides ten definitions from a variety of publications.

Generally speaking, the term pervasive games encompasses a wide range of emerging and interrelated game types. Such games are typically played in urban areas, often use a range of digital media platforms such as mobile phones or GPS tracking as well as analogue media such as posters, maps or notes, and can involve physical activities including performance and treasure hunts.

Pervasive games involve three main technologies (Bo Kampmann 2005). First, displays such as mobile phones, handheld or wearable computers are needed to make digital content available for players. Secondly, wireless communication channels enable players to communicate with remote servers. Finally, sensors are required to capture the current context of the players (GPS units, cameras, and other sensors), so that the gaming experience changes according to where they are and what they are doing. Players with mobile computing devices move through the world, while sensors capture information about their current state and GPS detects their location. All players are connected to each other via wireless networks. In such a way, it is possible to provide a gaming experience that adapts to their current position, activity and, sometimes, even their mood status.

There are several approaches for creating pervasive games, including reinterpreting classic computer games and mapping them into the physical world. Other approaches are based on established physical games, including treasure hunts and team challenges, which are augmented with mobile communications, mainly as a way of coordinating players. Magerkurth et al. (2005) identified several unique types of pervasive games, each focusing on different aspects of the gaming experience.

Tourism can benefit from pervasive gaming elements. Applications or games can be developed for tourist attractions to increase the knowledge about them. For large tourist cities, for example, tourists could have some interactive quiz around the city, enhancing their experience with the help of pervasive applications or

games. Most of the currently existing applications in the tourism and leisure sectors are based on a game principle similar to a classical treasure hunt. Players try to find certain objects (treasures) in an unlimited space. Such objects may not be valuable, but their discovery is a reward in itself.

One representative example of a treasure game in tourism is REXplorer, a mobile, pervasive spell-casting game designed for tourists of Regensburg, Germany (Ballagas et al. 2007). The game creates player encounters with spirits that are associated with significant buildings in an urban setting. A novel mobile interaction mechanism of "casting a spell" allows the player to awaken and communicate with a spirit to continue playing the game. The game is designed to inform visitors about the history of the city in an attractive way.

Currently, public tourism boards are also developing games to attract new travellers and encourage them to make the most of their visits. For example, Stray Boots (https://www.strayboots.com [Oct. 18, 2013]) merges a walking tour with a treasure hunt game to immerse tourists in the destination. Visitors can play the game on their smartphones while they explore local attractions, answering multiple-choice questions and completing simple challenges. Once the challenges have been successfully achieved, tourists earn points and badges, climb the leaderboard rankings, and share their accomplishments and travel experiences with friends.

Finally, Wu and Wang (2011) have developed "The Amazing City Game", a pervasive game on an Android platform where players can play a knowledge competition tour in groups in the city of Trondheim, Norway. The game is an adventure game where the players have to solve tasks at different locations by using relevant technologies from the Android phone. The results show that the concept of using Pervasive Game in a learning context is an interesting concept that should be further explored. Thus, *ExCORA* will try to explore this path in the tourism destination domain.

2.2 Pervasive Augmented Reality Games

Perhaps the most technically challenging genre of pervasive games is the AR genre, which further extends pervasive games through the use of AR technology (Broll et al. 2006). The environment of the player is extended through the use of real and virtual objects, changing the spatial and temporal presence of the user. Most of these games are outdoor games. Users need specific equipment to view the registered 3D objects in real space with three general approaches: head-mounted displays, hand-held devices, or projectors.

The development of pervasive AR games is in its early stages, as many of the existing applications have focused on the technology rather than on the design of the game. For instance, recent research in AR for cultural exploration has focused on 3D reconstructions or virtual character animation to allow immersive tour experiences on site. Ardito et al. (2007) have designed a mobile system that

supports young students who learn history at an archaeological site. The system adopts gameplay as an effective technique for learning and runs on the mobile devices of the students.

Another representative project is an outdoor edutainment game called *TimeWarp* (Herbst et al. 2008). The story of the game is based on the legend of the *Heinzelmännchen* of Cologne, Germany, which were small elves who worked clandestinely for the citizens during the night. The overall goal of this game is to find and bring back the *Heinzelmännchen*. Thus, the players are equipped with a mobile AR system and a handheld-based information device.

Finally, *Eduventure* is played in the medieval Marksburg Castle situated in the Middle-Rhine Valley in Germany (Ferdinand et al. 2005). The plot is about a scientist travelling back into the time of the 30 Years' War to find a prisoner in this period. The position and orientation detection is completely based on marker-based computer vision. The game is designed for constrained environments, as the castle has to have ARToolKitPlus markers placed around it. These markers have to be found by the player using a Tablet PC equipped with a USB webcam.

ExCORA can be classified within the concept of pervasive AR games. It is a game where the players move around in the real world, visiting key locations while following a treasure game on their iPhone devices. Furthermore, the experience is enhanced by the use of AR technologies as explained in the following sections.

3 Description of the Game

The main goal of *ExCORA* is the development of collaborative and multiuser pervasive AR games in open environments for tourism destinations. The creation of such experiences will be based on the combination of different basic elements. Each of these basic elements will represent a specific activity (e.g., augmented game, insertion of virtual objects in patterns, collaborative augmented activity, etc.) related to the corresponding PoIs.

3.1 Game Mechanics

Playing *ExCORA* only requires an iOS device and the willingness of the player to move around in the physical playing area, looking for answers to the proposed challenges. The flow of the game consists of players finding their way to specific locations or PoIs. In those places, they are rewarded with story segments within which lie hints towards where to head next. When players arrive at a PoI, they have to validate the visit to unlock the next PoI.

Playing the game begins with a short introductory video followed by a welcome screen where players are informed about the dynamics and objective of the game. Then, the display shows the map of the game field and the position of the player on

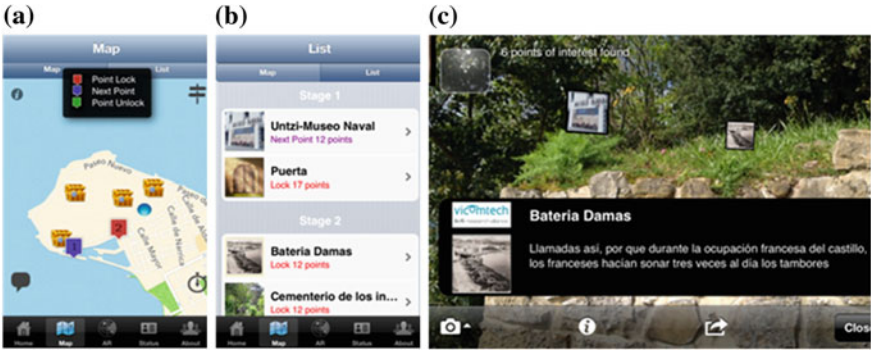

Fig. 1 Position of the PoIs: **a** Map-view. **b** List-view. **c** Augmented view

the map. The PoIs are displayed either on a map-view, a list-view or an augmented view. As it can be seen in the map-view (Fig. 1a), the green PoIs are those that have been already validated, while the purple one is the next one to be validated and the red ones are the PoIs that are locked for their validation. Current position of the player is represented by a blue point. PoIs are grouped into phases. Once all the PoIs of a phase have been validated, the PoIs of the next phase are shown on the map. Regarding the list-view (Fig. 1b), it includes all the PoIs of the experience so that players can estimate the length of the game. Finally, there is also an Augmented view option (Fig. 1c) available to help players to orientate while moving between PoIs.

Once the player has clicked on a PoI, the game provides descriptive content as well as access to the validation of the PoI. Each PoI is described by an image and a text, and optionally also by a video, audio, 3D object, or panoramic image. There are two ways of validating each PoI in order to ensure that the player is physically next to it. On the one hand, players can search for Quick Response (QR) codes close to the PoI. Once players click on the validation button, the camera is activated and they can scan the QR code. The application checks the scanned QR code to detect whether it corresponds to the expected PoI. On the other hand, the PoI can also be validated by the location of the player provided by the GPS sensor from the smartphone.

The generator of the experience can decide the validation method for each PoI: only QR codes, only GPS, or both of them. In the case of the GPS, the maximum distance to the PoI and the error range of the position provided by the GPS sensor can also be configured for each PoI. Thus, the game can be adapted to different scenarios where QR codes cannot be physically placed or where the GPS is not available or accurate enough (e.g., on narrow streets of historical districts in some cities).

Once the PoI is validated, the game presents a mini-game that reward players upon completion. This results in the experience being divided into mini-games that constitute the nodes in a branching story structure. Several mini-games that are

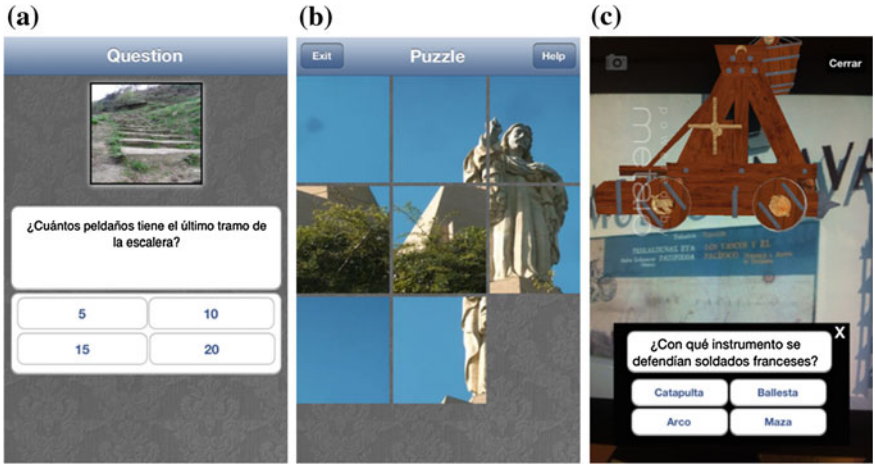

Fig. 2 Several mini-games implemented in *ExCORA*: **a** Multiple choice. **b** Puzzle. **c** Augmented reality

closely related to the corresponding PoI have been developed to extend the knowledge about the history of the city:

- Multiple Choice (Fig. 2a). The player should choose the right answer out of image- or text-based questions bundled with alternative answers. Questions can be related to the location of the PoI, such as information about the PoI or the places nearby.
- Puzzle (Fig. 2b). The player has to order the pieces of a puzzle. The original image is also shown as a help and the player can skip the game if he/she is not able to successfully solve the puzzle.
- Augmented Reality (Fig. 2c). The player uses the camera of the mobile device to focus on an object near the PoI in order to view an augmented object that provides the information required to successfully answer a related question.
- Augmented Multiple Choice. As the player moves the camera of the mobile device around, multiple choice questions appear augmented on the screen.
- Question Pool. The player is presented with several multiple choice questions. This mini-game is used as the final summary of the story when players validate the last PoI of the game.

When a mini-game is answered or completed correctly, players are rewarded with points for completing that challenge. The points represent the skills and knowledge of players. *ExCORA* also presents some special PoIs called "treasures" and represented as treasures chests on the map (Fig. 1a). Visiting these treasures is not compulsory to finish the game, but they give extra points to players when visited. Once the game is over, *ExCORA* will display the number of points for each player, so players can also compare their points in a ranking with other users. Moreover, each player gets a QR code to be rewarded with some type of prize.

Depending on the number of points, players can even win physical prizes at the Tourism Office.

ExCORA has some additional options to enhance the game. For instance, the game includes social communication capabilities so players can access the score, visited PoIs and location of other players, as well as communicate among them using a chat feature. Furthermore, they can also access an information section to configure the username and image used to represent them on the chat, and to gain information about their achievements during the game (e.g., points, validated PoIs, etc.).

Finally, it should be mentioned that *ExCORA* pays special attention to three critical issues. Firstly, help is considered an important element that should always be present before and during the game. The help includes both the instructions of the game in order to facilitate the gameplay and the specific instructions related to each of the mini-games, including the steps to follow to use the AR features. Secondly, *ExCORA* has been designed to be fully usable even for players with no Internet connection, as the case for foreign tourists. In these cases, some functionalities such as the AR view (Fig. 1c), chat, and data about other players will not be available. Nevertheless, players will be able to finish the game. Thirdly, contents of the game can be updated without installing a new version from the Apple Store. If the mobile device has Internet connection, when initializing the application, the game checks if new content is available on the server and downloads it.

4 Implementation of the Game

The game has been implemented following a client/server architecture (Fig. 3). The server is based on an Apache Web Server, while the MySQL database and the logic have been developed using the Slim PHP microframework. The client has been developed as a multilingual iOS 6 application optimized for iPhone 4 (or newer) devices, being also compatible with iPod and iPad devices. At this stage, the game has not been published at the Apple Store, but has been installed directly on the validation devices (ad-hoc distribution).

Although the installed client application includes all the content required to finish the game (i.e., images, PoIs, audios, etc.) and is fully usable without Internet connection, some functionalities require internet connectivity. They are marked with an asterisk in Fig. 3 if they partially require connectivity and with two asterisks if they are unavailable without connectivity.

The client stores the multimedia contents as multimedia resources. The structure of the game (i.e., order of PoIs, rewards, etc.) and the description of its elements (i.e., PoIs, treasures, etc.) are stored on a SQLite database. Each time a game starts, the upgrade module checks whether there is a new version available on the server and downloads the latest version of the SQLite database. The interaction of the player with the game (i.e., validated PoIs, obtained points,

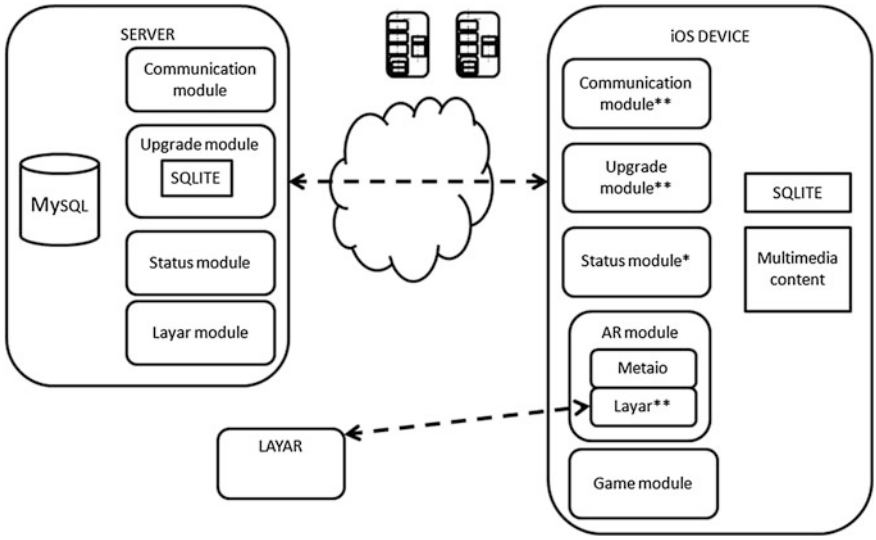

Fig. 3 General architecture of the prototype

geolocation of the player, etc.) is stored by the application using system variables on the device and then sent to the status module of the server. The server stores this information to share the status with others players. The communication module manages the messages sent (chats) and received (chats and push notifications) by the players and alerts them when they receive new messages.

The AR module is based on two AR engines: Metaio and Layar. In both cases, the free versions of the engines that allow integrating them on the application have been used. Version 4.0 of the Metaio SDK has been chosen to manage the use of AR within the mini-games (Fig. 2c) due to its better personalization capabilities and performance of the object recognition engine. However, in order to provide the AR interface for orientation (Fig. 1c), version 2.0 of the Layar Player SDK has been integrated due to its more usable user interface. It should be mentioned that the Layar engine requires Internet connectivity: each time the augmented view is started on the application, the engine connects to the official Layar server to retrieve the URL of a REST service where the information of the AR layer is stored. This URL is defined when creating the AR layer on Layar and it is the URL of the Layar module of the server in *ExCORA*.

Finally, the game module manages the flow of the game. This module controls aspects as the validation process of the PoIs, the rewards obtained by the players and the allowed order to visit the PoIs. The server contains four different modules that expose their services as REST services. The "Communication" module manages the chat (messages, username and photo of each player) and the notifications. The notification mechanism of the game is based on the open source easyAPNS notifications service that allows sending push notifications to players.

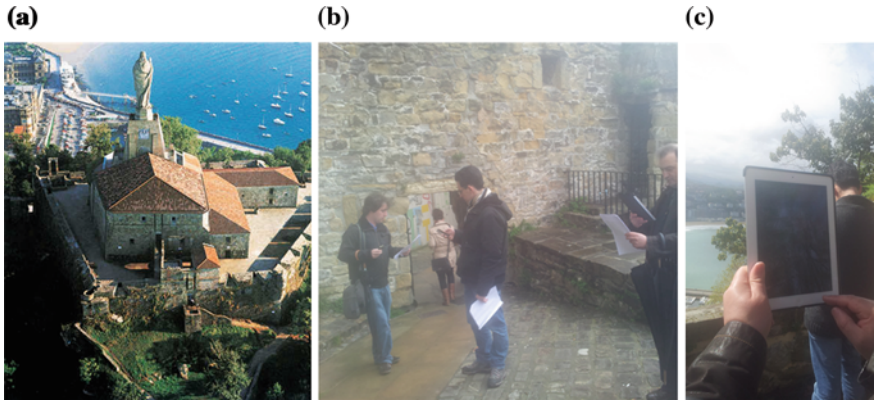

Fig. 4 Some pictures during the preliminary validation campaign. **a** Urgull Mountain **b** and **c** Players during the validation

Furthermore, the "Upgrade" module increases the version number for the contents each time the SQLite database is changed so the client application can download the most recent version of the game. The "Status" module stores all the information sent and sends the status of the rest of the players. Finally, the "Layar" module sends the information to be displayed on the application to the Layar engine of the client using the format defined by Layar.

5 Validation

The background for the validation game of *ExCORA* is the battle between the French and Anglo-Portuguese troops that occurred in San Sebastian from the 28th of June to the 8th of September 1813, exactly 200 years ago. The game takes place in the Urgull Mountain (Fig. 4a) where the fortress was placed. Still today, visitors can touch the canyons and the defensive walls. As players walk around, they have to find several relevant locations so that they can interact with different elements. The Town Hall is promoting cultural visits to Urgull Mountain with an important investment on tourist promotion. The game starts outside the walls of the fortress and finishes on the flag located on the top of the Urgull Mountain. Players take the role of an English soldier trying to defeat the French army garrisoned on the fortress. The generated experience has six PoIs and four treasures with different contents, validation methods and related mini-games.

A preliminary validation campaign has been conducted during April 2013 with six partners of the project in order to assess both the contents and the technical performance of the prototype (Fig. 4b, c). Each player carries a smartphone or iPad with a built-in camera and GPS receiver, which provides the main requirements of the game implementation: positioning and ability to read visual tags.

In order to validate the usability with no Internet connection, only four of the participants had Internet connection. The validation took around one hour and a half to complete the game.

The final evaluation of the *ExCORA* game planned for Autumn 2013 will be based on the Pervasive Game Flow model (Jegers 2009), which encloses 8 elements and 50 criteria. As a testing bed for the large scale evaluation of the prototype, several aspects of the model have been analysed during the preliminary validation campaign. The first aspect is the concentration on the pervasive game, as the player should divide the attention among the in-game tasks and those in the surrounding environment outside the game. The testers checked that the design of the game was quite appropriate and integrated with the context (e.g., QR codes on tourist information panels, PoIs well identified), so there were no conflicts between the rules of the game and the contextual situation of the tourists, allowing them to enjoy the validation scenario while moving between PoIs. Moreover, the unexpected mini-games for each PoI surprised the players so that they maintained their focus throughout the game.

Another important aspect to be evaluated is supporting the skill development of the players, who should be able to start playing the game without reading a written manual. All the participants in the evaluation campaign were able to play the game and reach the end. However, it should be mentioned that the sample was biased by its technological background and knowledge about mobile applications. Distances and locations of the PoI were easy to reach and the challenges could be achieved in most of the cases. The option to leave the puzzle unresolved was welcome, as this was considered a difficult challenge by most users.

The interface of the game was perceived as simple and intuitive, allowing players to feel in control over their actions, clearly communicating the goals of the game and giving feedback about their actions, progress and score. Players become immersed on the game, not being aware of the time taken to finish the game. Regarding the social interaction, as all of the six users experienced the game together, participants spoke directly among them instead of using the chat provided on the game after some successfully tests. However, they used the application to check the situation of the rest of the group and compete among them. Finally, testers propose some further improvements related to aspects such as the rating of the PoIs and share comments about them. Suggested improvements include increasing the amount of narrated audio content (to be heard while moving between PoIs), and optionally the access to extended contents related to some PoIs.

6 Conclusions and Future Work

This paper presents *ExCORA*, a pervasive mobile game that aims at encouraging general public to visit and explore the natural environment of the Urgull Mountain in San Sebastian, Spain, as well as educating visitors about the hidden history of the Mountain. The project explores how pervasive AR game approaches can be

used to deliver an engaging tourism experience. The game provides a fun and interactive way to guide participants through different PoIs, allow them to search for unique QR codes to unlock clues and answer quiz questions, and augment some buildings. This paper outlines the design and initial deployment of the game, reporting on results from a preliminary usability study and discussing initial observations made by visitors.

One of the most notable characteristics of *ExCORA* as a pervasive game is the focus on the real, physical world. Tourist PoIs become part of the game. However, such PoIs should be carefully selected in order to be able to precisely track the location of the visitor. PoIs with scarce GPS coverage in outdoor environments should be avoided so that visitors have a continuous experience. Furthermore, PoIs should allow posting the QR codes for the experience in their nearby. The validation campaign demonstrated that it is desirable that such codes are placed in the traditional signalization of the PoIs. Finally, the preliminary validation reinforced the need to extend the number of PoIs for the experience, which, in any case, should not last more than 2 hours.

Future work lines are opened both on the client application and on the server. Regarding the client, next steps are focused on the publication of the application on the Apple Store, the development of an Android version of the game, and the personalization of the game experience according to the profile of tourists (i.e., family, youngster, elderly). Future work on the server includes mainly the development of tools to generate new experiences and to exploit the information gathered on the server about users (i.e., visited PoIs, tracks, times, etc.).

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Dublin AR: Implementing Augmented Reality in Tourism

Dai-In Han, Timothy Jung and Alex Gibson

Abstract The use of modern technology is becoming a necessity of many destinations to stay competitive and attractive to the modern tourist. A new form of technology that is being used increasingly in the public space is virtual- and Augmented Reality (AR). The aim of this paper is to investigate tourists' requirements for the development of a mobile AR tourism application in urban heritage. In-depth interviews with 26 international and domestic tourists visiting Dublin city were conducted and thematic analysis was used to analyze the findings of the interviews. The findings suggest that although Augmented Reality has passed the hype stage, the technology is just on the verge of being implemented in a meaningful way in the tourism industry. Furthermore, they reveal that it needs to be designed to serve a specific purpose for the user, while multi-language functionality, ease of use and the capability to personalize the application are among the main requirements that need to be considered in order to attract tourists and encourage regular use. This paper discusses several significant implications for AR Tourism research and practice. Limitations of the study which should be addressed in future research are discussed and recommendations for further research are provided.

Keywords Augmented reality · User requirement · Mobile application · Dublin

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1 Introduction

Many researchers in the tourism industry argue that the tourism industry is becoming more and more competitive and surviving as well as marketing a destination has become a challenge. In order to gain a competitive advantage, the use of modern technology is crucial for many destination-marketing organizations. Mobile-based virtual experience for the tourism industry has been identified as a potential form to modify current consumers' pre-, en route, and post-experience (Kalawsky et al. 2000). Whereas museums have already started to preserve media, such as radio, movie clips and photography to enhance visitor experience (Grinter et al. 2002), the approach of pushing information lacks the interactive aspect of tourists and technology. Augmented Reality has been the buzzword of modern technology and is experiencing rapid development and implementation in many industries, especially with the launch of the Google Glass project scheduled in 2014 (Wrenn 2012).

However, the use of Augmented Reality for tourism purposes, although attempted in various ways, such as outdoor navigation (Reitmayr and Schmalstieg 2004), tourist binoculars by overlaying interactive information (Fritz et al. 2005) and reconstructing archaeological information (Vlahakis et al. 2001) is still not studied thoroughly in order to present a valid model of implementation. Furthermore, the end-user point of view has been widely neglected in the development process of AR in tourism. Therefore, this research is conducted in the tourism context and aims to identify and analyse tourist requirements to implement Augmented Reality technology in Urban Heritage.

2 Dublin Augmented Reality Tourism Project

The Dublin AR Project emerged from a partnership between Manchester Metropolitan University (MMU), Dublin Institute of Technology (DIT) and the Dublin City Council. It originated from the idea of supporting Dublin's brand development to become the 'innovative city' in Europe. Thus, the end result of this research aims to develop a mobile AR application for the tourism industry in Dublin, which will be applied via tourist trails in various parts of the destination by considering various tourism stakeholders. This application will provide a platform to superimpose tourism relevant information, reconstruct and revive stories of the past, assisting the tourist in creating an emotional experience of the intangible product. With the aim of forming the city image to a 'test-bed of innovation', it has been aimed to be the first European city to implement an AR infrastructure, not only benefitting tourists, but also its citizens and other stakeholders, such as SMEs and the city development. In order to achieve this goal, this paper presents the research that was conducted up to date, which includes tourist interviews as one of the main stakeholders. The current work-in-progress report will therefore only cover the early stage of the overall project and its key findings.

3 Augmented Reality in Tourism

As Augmented Reality has been researched, many attempts have been made to give a proper definition. In general, Augmented Reality refers to enhancement of the real environment by computer-generated content, which is up to date mostly supplemented with graphical content (Hyun et al. 2009). However, although Augmented Reality technology has existed for more than 10 years, it is still a fairly new concept within the tourism industry, it has not yet been fully developed, which leads to a constant challenge to define Augmented Reality properly.

Augmented Reality provides significant benefits for many industries due to its nature of mixed environment, or computer enhancement of real world setting (Azuma et al. 2001; Reinhart and Patron 2003; Van Krevelen and Poelman 2010). Academics as well as industry practitioners argue that Augmented Reality provides many opportunities for mobile computing applications, which need to be seized in industries such as tourism, as being linked with the context of the immediate location (Olsson and Väänänen-Vainio-Mattila 2011).

Due to the potential of enhancing the immediate surrounding, Augmented Reality has been considered to be of high potential for the tourism industry (Fritz et al. 2005). A tourist is a person who typically has "little or no knowledge of the environment" (McKercher and du Cros 2003) Thus, such a location-based device, which can be used to access information in the immediate surrounding, would greatly benefit this industry. As tourists in general are interested in their environment, the use of Augmented Reality devices have the potential to create the next generation of computerized tourist guide (Olsson and Väänänen-Vainio-Mattila 2011). According to Höllerer and Feiner (2004), the user interface should not only be able to pinpoint the user's location, but also provide background information of the area that might be of interest. This idea has led to a great interest in inventing tourism application for mobile utility (Cheverst et al. 2000). Such applications are continuously being modified in order to improve efficiency to be fully functional. The city of Vienna provides a tourist guide application, which is able to guide the user to certain locations via navigation, as well as is able to provide location-based information on nearby places, which can be selected at will (Cheverst et al. 2000). Thus, it is multiple-user friendly, which allows various users to share information, while constantly being mobile supporting the trend of social networking. The tourism industry requires constant investment into new technologies, preferably for mobile use, in order to continue attracting visitors. It was argued that this is a great challenge for many destinations around the globe that lack sufficient funding opportunities (Fritz et al. 2005). As of 2013, the majority of smartphones provide navigation, GPS-map based systems, which are able to pinpoint the user's exact location. The literature states that mobile phones are able to access up to date content, flexibly to deliver text, image and video data and can provide additional information on a map-based system (Yovcheva et al. 2012). However, such applications are still being improved, as their functions are very limited and do not allow multi-user usage (Gazzard 2011).

Current implementations of AR in tourism lack effective engagement of the user and provide an enhanced experience to the tourist. Furthermore, it has not yet been made flawless, and includes many bugs, which need to be overcome before offering it to the public. Another challenge is the acceptance and adoption to such devices, as many tourists still prefer traditional sources, such as travel books and other sources of media (Pang et al. 2006). Nonetheless, Augmented Reality shows high potential in becoming a main-stream technological tool in tourism in the near future due to its practical usefulness, which can be employed indoors as well as in outdoor environments (Fritz et al. 2005).

4 AR Applications in Urban Heritage Tourism

'Heritage Tourism' has become the "buzzword of the 1990s" being the fastest growing tourism sector (Chang et al. 1996). Recent research by the Heritage Lottery Fund (HLF) showed that heritage tourism in the UK notes GBP 26.4bn of the overall economy in the UK (Heritage Lottery Fund 2013). While travel is no more a luxury, tourism destinations face the challenge as well as opportunity to present and cater to a widely ranged market all over the year, while repackaging the attractions in a destination to tell different stories according to the tourists' interest. Although the term heritage tourism is being used for various areas, a common definition is still difficult to find and highly debatable (González-Pérez and Parcero-Oubiña 2011). Thus, academics and industry practitioners have employed various definitions of heritage tourism depending largely on historic aspects of a tourist attraction (Poria et al. 2003).

Many theories and themes exist regarding why urban heritage tourism has started to develop as one of the key areas of heritage tourism. Global economic influence has been pointed out as one of the major reasons of tourism development in cities (Chang et al. 1996). Heritage cities, such as Dublin and Venice are considered to be the attraction themselves. Therefore, the whole destination itself is regarded as heritage site compared to other destinations that prosper through the impact of specific tourist attractions. Hence, the impact on the destination is of socioeconomic nature, reflecting the conflict between tourism and social and economic concerns. However, it is evident that the number of tourists interested in heritage cities in steadily growing, affecting the living standard of residents as well as the tourist experience. Technology has been seen as an economic tool to support development and competitiveness in many tourist destinations and is constantly being investigated regarding its use and new ways of implementation. However, Augmented Reality is still considered a new technology in tourism and requires more in-depth research to enhance the tourist experience (Fritz et al. 2005). Therefore, this study aims to investigate tourists' requirements when implementing a mobile AR tourism application in Urban Heritage.

5 User Requirements in the Mobile Computing Context

Previous literature was investigated to identify user requirements in the mobile computing context. As Augmented Reality is still considered a new technology and not yet examined to a great extend, literature on Augmented Reality as well as the identification of user requirements for Augmented Reality applications is limited. Thus, user requirements in the software and mobile computing context were identified from previous studies to test the validity for current mobile applications and identify newly emerging themes. Since not all requirements are relevant for the purpose of this study, key themes were identified from the literature. A reoccuring theme in software as well as mobile computing was simplicity and design of the user interface (Gafni 2008a, b; Herzwurm and Schockert 2003; Pulli et al. 2007; Tan et al. 1998; Zheng and Pulli 2005). It needs to be clear with a prompt access to required information. It was pointed out that information needs to be sufficient for the purpose of the application and relevant for the user (Herzwurm and Schockert 2003; Gafni 2008a, b). However, the difficulty with information load was seen to be the speed of the application and decreased reaction and loading times (Tan et al. 1998; Herzwurm and Schockert 2003; Pulli et al. 2007; Gafni 2008a, b). Thus, the size of the application was suggested to require control to facilitate the installation process. Although price and product comparison were among the reoccuring themes in previous literature (Herzwurm and Schockert 2003), it was pointed out that safety and security issues were not to be ignored and privacy should always be considered the as a priority (Gafni 2008a, b; Herzwurm and Schockert 2003; Zheng and Pulli 2005). Access to the application was another key theme in regards to time, location and browsers/hardware. The application should be accessible at any time, any where and be designed to run on various platforms (Herzwurm and Schockert 2003; Zheng and Pulli 2005). Although social functions were among the newer emerged themes in the literature, it was obvious that this social networking and reviews was gaining in importance as more people exposed themselves to social networking platforms such as Facebook and Twitter (An et al. 2008; Herzwurm and Schockert 2003; Zheng and Pulli 2005;). Furthermore, a trend was seen towards personalised interfaces and service as peoples' expectations of personalised marketing messages and services was increasing (An et al. 2008; Gafni 2008a, b; Herzwurm and Schockert 2003; Zheng and Pulli 2005). While people were in more time-pressure than ever before, another key theme was identified as efficient and time saving (An et al. 2008; Herzwurm and Schockert 2003; Pulli et al. 2007; Zheng and Pulli 2005). Previous literature argued that mobile softwares would need to become more efficient in its use and provide the user with enough convenience in order to attract utilisation. Finally, ease of use was a reoccuring key theme that would enable the user to utilise the a mobile application without having to go through a learning process (Gafni 2008a, b; Herzwurm and Schockert 2003; Pulli et al. 2007). Table 1 shows identified user requirements in the mobile computing context.

Table 1 User requirements in the mobile computing context

User requirements	Authors
Simple and authentic user interface	Tan et al. (1998), Herzwurm and Schockert (2003), Zheng and Pulli (2005), and Pulli et al. (2007), Gafni (2008a, b)
Relevant and updated information on surrounding	Herzwurm and Schockert (2003), and Gafni (2008a, b)
Speed	Tan et al. (1998), Herzwurm and Schockert (2003), Pulli et al. (2007), and Gafni (2008a, b)
Price and product comparison	Herzwurm and Schockert (2003)
Safety and security (privacy)	Herzwurm and Schockert (2003), Zheng and Pulli (2005), and Gafni (2008a, b)
Accessibility	Herzwurm and Schockert (2003), and Zheng and Pulli (2005)
Social functions	Herzwurm and Schockert (2003), Zheng and Pulli (2005), and An et al. (2008)
Personalisation	Herzwurm and Schockert (2003), Zheng and Pulli (2005), An et al. (2008), and Gafni (2008a, b)
Efficient and time saving	Herzwurm and Schockert (2003), Zheng and Pulli(2005), Pulli et al. (2007), and An et al. (2008)
Ease of use	Herzwurm and Schockert (2003), Pulli et al. (2007), and Gafni (2008a, b)

6 Research Methodology

In order to generate a valid model to implement AR technology effectively in mobile tourist applications, it has been decided to identify tourists' user requirements as one of the main stakeholders to develop the AR application. Due to the lack of research in this area, an inductive research approach in form of in-depth interviews was chosen to be suitable for this part of research. Interview questions were designed based on identified themes of user requirements in the mobile and computing context. However, as it was assumed that AR is still widely unknown, questions in mobile behaviour and perception were leading into the topic. The population was taken from a range of domestic as well as international tourists visiting the capital. After the critical investigation of literature regarding AR technology in the tourism industry, as well as previously identified user requirements in the mobile and computing context, qualitative research through 26 in depth tourist interviews was conducted in Dublin. By considering the main market segments in Dublin according to the Failte Ireland report 2010, the sample was taken of tourists from France, Germany, Spain, America and the UK. The interviews were conducted in two interview sessions from mainly the key tourist markets in Ireland ($n = 4$), UK ($n = 8$), USA ($n = 3$), Germany ($n = 4$), France ($n = 3$), and Spain ($n = 2$). Although it was attempted to target an equal gender proportion, 70 % of participants were female, and only 30 % male, most of them being students and young professionals making frequent short trips during the year. 65 % of the sample were tourists between the age of 22 and 30, while 19 % were under 21 and 8 % between 31 and 40 as well as 8 % between 41 and 50.

Three examples of Augmented Reality including three modalities, text/image and video overlay as well as an example of GPS-based AR were prepared to support tourists' understanding of Augmented Reality before and during the interview. Research was conducted at two separate city centre hotels, over two weekends in February and April. Using street-intercept, a total of 26 tourist interviews were conducted. Respondents were screened to ensure they were visiting as short-stay tourists, and a broad variety of demographic profiles were sought. While the research is of an exploratory nature, it was felt important to try to reach a broad cross- section of tourists. Respondents were invited to participate in a 40 min research interview which took place in the hotel lobby (to show stimuli) and also in a dedicated board-room setting. Two pilot interviews were conducted prior to tourist interviews in order to test interview questions and make modifications where necessary as well as to reorganize recording devices. The first interview session was conducted in a conference room of the Gresham hotel, which is located on O'Connell street and provided a prime location of passing tourists. However, due to difficulties of fetching volunteers from the street, as tourists were mostly passing through, the second session was held in the lobby of the Fleet Street hotel, located in the Temple Bar area. This district is known for attracting many tourists all day being the prime location for pubs and entertainment.

Each interview was transcribed word by word to serve as tangible source for the data analysis. For the purpose of this research, a thematic analysis technique was used in order to analyse and interpret the collected primary data through interviews after reoccurring themes were examined in the literature in the mobile context. Thematic analysis identifies reoccurring themes in the data and develops a framework of themes that serves the data interpretation. Additionally, Denzin and Lincoln (2005) argue that thematic analysis is often used as communication tool to present and interpret findings between researchers using other analysis methods. Themes from the literature were used as a guideline, which were all coded manually in order to facilitate the organisation and identification of relationships in the data. After generating a table of criteria including identified themes and requirements were put in contrast to the literature to uncover newly approached ideas.

7 Research Findings

The key findings were summarized to present an overview of the most common repetitive themes that emerged from the tourist interviews.

Interviewees ranged between the age group under 21–50, with most participants ranging from 22 to 30. The key tourist markets in Dublin were covered as well as some tourists from Scandinavian countries. Although it was attempted to target an equal gender proportion, 70 % of participants were female, and only 30 % male, most of them being students and young professionals making frequent short trips during the year.

Most of the tourists interviewed were currently using a smartphone mainly for social purposes. Furthermore, it was found that most tourists had never come across Augmented Reality and were not aware of its existence, or any AR applications. All tourists saw the potential use of the provided AR examples, however, for most interviewees it was not a 'wow' factor.

7.1 Local Context

Many tourists found the indication of prices on menus, tickets and other products very helpful. This feature was mentioned several times to avoid the unknowing "walk-in" into a restaurant just to find out the menu or price was not what the tourist expected. It was argued that tourists in general did not have the information where to get good deals and only little access to local places to really experience the culture and people of a destination. Thus, tourists argued that relevant information of the area was necessary, such as on-going events and markets that run only during specific times of the year and week. This would avoid the unnecessary visit to a closed attraction.

7.2 Reviews/Social Network

Furthermore, most of the tourists thought that reviews of other people, preferable other tourists as well as ratings were very helpful for the decision making process of which tourist attraction to visit, or where to dine. The social aspect was also considered by many tourists as important factor to encourage regular usage of the application. Many tourists suggested the link of the AR tourism application to established and widely accepted social network platforms, such as Facebook and Twitter, but discouraged the establishment of a completely new social media platform as tourists needed to join another new unknown network to use the application.

7.3 Personalization, User Empowerment

Most of the interviewees were looking for a tourist application that could organize trips and save individual profiles in order to make the application more personal and shape the trip according to their interest. It should be designed to make travelling and planning easier and more efficient, rather than having to spend hours of planning prior to the visit. Many people especially having come for business did not have the time to plan their visit, or required immediate access to tourist information due to sudden changes. However, it was pointed out that the

application should only give recommendations, leaving it open for the tourist to decide which route to take or where to go. This would provide flexibility to make changes according to the immediate mood of the tourist.

7.4 Map, Easy Navigation

As most interviewees were using Map applications on a daily basis, it was advised that the application should include a map of the destination, which was easy to navigate and could pinpoint locations. A common way was to link the application to Google Maps. However, since AR features are included in the application, tourists were unsure whether this link was possible. Alternatively, navigation would be built through the camera lens and show virtual arrows and route indications overlaying the real environment. However, many tourists repelled the fact to hold their mobile device for long-periods of time in front of them to navigate through the city. Furthermore, the accuracy of the application was an issue as many tourists had negative experiences with the GPS accuracy of their mobile device.

7.5 Multi-Lingual, Internationality

Another theme that emerged was the multi-lingual aspect of the application, as many tourists did not find it enough to provide the application in English. Furthermore, this would significantly limit the market that is able to use the application. Thus, it requires the application to be translated accurately in order to present the same quality and functions in every available language. A translating feature and often-used phrases as well as money exchange rates were also mentioned multiple times. AR was seen as a potential technology to implement a translating function by screening signs and names and being able to translate them into the relevant mother tongue.

7.6 Up to Date Information and Speed

In order to assure long-term functionality and usage, it was found important to keep the application up to date. This refers to promote relevant information in the timeframe the tourist is residing at the destination as well as public information, such as timetables for public transports, menus and prices and opening times of attractions. However, although tourists believed the application should include a lot of information, it was highly pointed out that the design of the application should be simple and user-friendly, while keeping the application fast. Since

content expansion significantly increases the size of the application, an alternative solution would need to be found, as tourists were deterred to download an application with of a large size, and further would refer to other sources if the application turns out to be slow to react and load information.

8 Discussion

The aim of this study was to examine whether the user requirements found in the literature were still valid, and if adjustments and new phenomena could be identified to suggest an implementation model of mobile Augmented Reality applications in the Urban Heritage Tourism context. Based on the findings, it can be seen that prior user requirements in the software and mobile computing context are still relevant for current and newly approaching technologies. All themes that were identified in the literature were mentioned again in the interviews, whereas Map systems and easy navigation functionality through proper implementation of GPS were newly emerged themes. Furthermore, multi-lingual aspects and internationalisation were key indicators of the market evolving globally. While travel possibilities expand and travelling is not seen as a luxury activity any longer, the people visiting urban destinations as short weekend trips has expanded internationally, making it more significant for applications to offer services in various languages and provide alternatives. On the contrary, safety and security issues were a key theme in past literature (Herzwurm and Schockert 2003; Zheng and Pulli 2005; Gafni 2008a, b), however, although it was mentioned in some of the interviews, the tendency towards social network exposure was more common. As more people expose themselves to open network platforms such as Facebook and Twitter, and newly emerging technologies, such as Google Glass, privacy issues are still to be monitored and the tendency of user acceptance and the willingness of exposure remains unclear (Guynn 2013). AR in general is still a very young technology with potential yet to be found (Pang et al. 2006). The nature of the technology has been argued to be of particular interest for the tourism industry, as it is capable to reveal information on the immediate surrounding by putting relevant data into a virtual space (Fritz et al. 2005). This phenomenon is especially interesting for destinations that are sensitive to disturbing the real environment, such as heritage sites (Kalay et al. 2007). Although many heritage sites exist, Dublin, as case study for urban heritage was chosen as the context of the study. Urban heritage has become significant for tourist destinations as a result of global economic influence (Rypkema 2005). However, although heritage and urban heritage has been studied for many years, the improvement of destinations in comparison has still been slow. Fritz et al. (2005) argue that technology needs to be constantly implemented in tourism destinations in order to stay competitive and attractive for tourists. Thus, the idea of the proper implementation of AR as the new media in tourist destinations has ignited this study.

9 Conclusions, Limitations and Recommendations

The present research suggests several key implications for AR applications in Urban Heritage Tourism. Firstly, the results of this study reveal that tourists need a source of local and up to date information relevant to the timeframe residing in the area.

Secondly, the results of this study show that social networking including suggestions and reviews of attractions and destinations are widely used among tourists and should be considered in a tourism AR application to encourage repetitive use. Thirdly, this study also reveals that the design of user interface and easy navigation are key factors for continuous utilisation of an application. Finally, multi-language capabilities as well as speed of the application were mentioned repetitively as significant factors in a tourist application to be useful for a wide market and assure long-term growth.

This study has a number of limitations and recommendations for future research. Firstly, the study was based solely on qualitative research, which proposes a limitation to generalize its findings. In order to test the validity of the research, it is recommended to use an additional quantitative approach with tourists in Dublin.

Secondly, it was tested in the Dublin context, which presents a developed European city, and therefore, might show different results compared to other destinations around the world. Thus, a similar methodology used for this study should be tested in different locations. An interesting approach would be the comparison between Dublin as a European city and an urban heritage destination in the Asian region to test different views on technology as well as cultural differences.

Thirdly, most tourists were unaware of AR technology and therefore heavily relied on the knowledge and experience of other tourist applications. Although examples of AR were provided, tourists were often unable to refer to Augmented Reality technology. Therefore, it is recommended to conduct qualitative research with a similar methodology once again after prototype of AR application had been developed. A post-experience research after developing the prototype letting tourists get and on-hand experience might provide a better indication of user requirements, as people would be aware of its capabilities and benefit from personal experiences.

Nonetheless, the current stage of this research should give an indication of tourists' requirements when implementing AR applications in the tourism industry and will progress in order to generate and to suggest a quality model to implement Augmented Reality (AR) technology in Urban Heritage by considering various stakeholders. This study will progress towards the investigations testing of other stakeholder requirements to provide a quality model including critical factors that need to be considered when implementing AR mobile applications in tourism.

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Gamification in Tourism

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Abstract Gamification, as a new topic, is a future trend which can be applied in tourism in many ways to elicit motivation and behaviour change. This paper is a conceptual work on gamification in tourism discussing the concept on how game design elements and game thinking can be applied in a tourism context. Based on that, it defines tourism gamification and identifies intrinsic and extrinsic motivation elements that can be used in gamification in order to influence consumer engagement, customer loyalty, brand awareness, and user experience in tourism areas. Best practice examples show where this innovative concept of gamification is already applied in tourism. The paper also outlines limitations of gamification and makes suggestions for future research.

Keywords Gamification · Customer engagement · Loyalty · Motivation · Tourism

1 Introduction

The term gamification first appeared in 2008 (Deterding et al. 2011) and has gained popularity since 2010 (Epstein 2013). The concept of gamification is defined as the *use of game design elements and game thinking in a non-gaming context* (Deterding et al. 2011) ranging from increasing brand awareness to

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encouraging consumer engagement. Due to its impact on consumer loyalty, it is seen as a revolutionary change in business (Ng 2011). It is estimated that 70 % of the global organisations looking for innovative approaches will be using gamification by 2014 (Gartner 2011). Gamification has already been successfully used in marketing, business, health and education.

The application of game design elements in tourism is already present but it might not have been recognised or been named as the concept of gamification. Every loyalty card or frequent flying program is a gamification approach as points are collected to be redeemed for a bonus. Examples can also be found in restaurants giving free cupcakes to game player's virtual game achievements such as Foursquare (Frey 2012) or Lufthansa and American Airlines' social media channels to generate brand awareness (WTM 2011). Gamification is a major trend for the coming years in tourism, which will appeal to consumers across all age demographics (WTM 2011). However, gamification is still a huge buzzword (Frey 2012) that lacks the discussion on how its concept can be best implemented into real business life (Ng 2011). The application of gamification in tourism is still in its infancy which is mostly affiliated to the limited academic research discussing game design patterns and game design mechanism for services and marketing (Huotari and Hamari 2012).

This paper provides a conceptual work of gamification in tourism by discussing game mechanisms that are applicable in the tourism industry. It also explores the benefits of gamification for different stakeholders in tourism and gives examples in the tourism industry where gamification has already been applied. Finally, the paper suggests further research on tourism gamification.

2 Games and Gamification

Juul (2003) defines games as "rule-based formal system[s] with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable." *Players* are the crucial objects interacting with the game system to create artificial experiences, which are different from everyday life. *Conflict* involves competition and collaboration between the players as well as fighting against the game system. *Rules* establish the limitations and liberties of gameplay within the system. The *quantifiable outcome* results at the end of the game in winning, losing or numerical scores (Salen and Zimmerman 2004). *Feedback systems* provide players information about the gained achievements in form of points, levels and scores and give a preview of the proximity to the next goal with the creation of constant player motivation. *Voluntary participation* requires that players willingly accept the previous traits for the gameplay. Voluntary play opens the ground for multiple players to join into the game and ensures that challenging and stressful gameplay activities are experienced in a safe and pleasurable environment (McGonigal 2011).

Game researchers (Juul 2003; Salen and Zimmerman 2004) suggest that games should be understood as systems in game design. According to Deterding et al. (2011), gamification distinguishes from other concepts such as serious games via a two-dimensional chart of playing/gaming and part/whole games. Gamification can be differentiated from whole games as it just uses game design elements in a different context and purpose other than games.

The concept of gamification is using game-thinking and game mechanics to engage an audience and to solve problems in a non-game context (Zichermann and Cunningham 2011). It is widely used in training programs (inward) and marketing campaigns (outward) to change behaviour and solve problems (Barata et al. 2013). Although gamification uses game mechanics, it cannot be understood as whole games.

3 Motivational Essentials of Gamification

Motivation is a central topic in gamification as gamified systems are implemented to change behaviour for wanted and desirable activities. Motivation in gamification uses a two-folded approach. First, *extrinsic motivation* focuses on applying gamified elements into a non-gaming context to stimulate external motivation. Second, game thinking and motivational design has a positive influence on *intrinsic motivation* as it is done because of an internal desire to play (Groh 2012; Nicholson 2012; Ryan and Deci 2000).

3.1 Game Design Elements

Extrinsic motivation refers to activities which are only done in order to achieve some distinct outcome in forms of rewards (Ryan and Deci 2000). Game designers draw upon a huge variety of rewards to create the optimal game experience for players, thus the question arises: which elements belong to the set of 'game elements' useful for gamification? There are vast variations in identifying important game elements depending on the game genre, digital and non-digital games. A strict interpretation would only accept elements, which can exclusively be found in games, whereas a more liberal interpretation accepts any game element. Deterding et al. (2011) suggest a restriction of game design elements for gamification to those which are characteristic to games, have a significant role in gameplay, and can be found in most games. Their research (Deterding et al. 2011) revealed five levels of game design elements (see Table 1) which should be included in gamification.

Gamified systems in business, marketing and education make use of more specific game design patterns and mechanics which are prescribed by Hunicke et al. (2004) in the MDA model. The MDA model proposes that game design is approached from the game designer's perspective using game design tools

Table 1 Levels of game design elements

Level	Description	Example
Game interface design patterns	Common, successful interaction design components and design solutions for a known problem in a context, including prototypical implantations	Badges Leaderboards Levels
Game design patterns and mechanics	Commonly reoccurring parts of the design of a fame that concern gameplay	Time constraint Limited resources Turns
Game design principles and heuristics	Evaluative gameplay to approach a design problem or analyse a given design solution	Enduring play Clear goals Variety of game styles
Game models	Conceptual models of the components of games or game experience	Challenge Fantasy Curiosity Game design atoms
Game design methods	Game design-specific practices and processes	Play testing Play-centric design Value conscious game design

Source Deterding et al. (2011)

(mechanics) to create a player experience (aesthetics). The interactions between these two perspectives result in the interactive gameplay (dynamics) which should meet the expectations and abilities of the player.

Game components are game tools and the basis for every gameplay. Depending on the individual game, these components include achievements, avatars, badges, boss fights, collections, combat, content, unlocking, gifting, leaderboards, levels, points, quests, social graph, teams and virtual goods. Some game components are more common than others because of their influence on the game system and their characteristics (Werbach and Hunter 2012).

Game mechanics describe the specific components, which are responsible for the function of the game, and give designers the facility to guide the player's behaviour. Game mechanics comprise of challenges, chances, competition, cooperation, feedback, resource acquisition, rewards, transactions, turns and win states. These mechanics describe actions, behaviours and control mechanisms and create, alongside game components, good gameplay dynamics (Hunicke et al. 2004; Werbach and Hunter 2012; Zichermann and Cunningham 2011).

Interactions of the player with game mechanics and components are the hidden structure of the game, named *game dynamics*, which evoke from meaningful choices, progression of gameplay and interaction between players (relationship/fellowship). These dynamics work towards the creation of different game experiences (aesthetics) (Werbach and Hunter 2012).

The actual game experience arising from the player's interaction with the game mechanics and dynamics and is known as *Aesthetics.* It reveals feelings, emotions, and fun in the player. These experiences are the composite combination of the game elements, which define the gameplay and lead to an optimal player experience (Werbach and Hunter 2012). Hunicke et al. (2004) provide a taxonomy to describe the dimensions of fun provoked from gameplay ranging from sensation and fantasy to fellowship and narrative, to name a few. The combination of game components, mechanics and dynamics can be mixed in any possible way to create the spectrum of experiences.

However, the combination of game elements will neither make a good gamified system nor create a fun and engaging experience. Instead, rewards can cause the opposite and let people feel de-motivated. Rewards are extrinsic motivators and, applied in the wrong way, can easily crowd out intrinsic motivation as the player might think the only aim of the game is collecting rewards which leads to an over-justification effect (Werbach and Hunter 2012). A recent study by Hamari (2013) analyses the implementation of 'badges' into a gamified utilitarian trading service which confirms that the mere addition of game elements does not necessarily have an impact on usage frequency or the increase of customer activities. Indeed, motivating people needs a deeper approach to be successful and to encourage people into an activity, which is engaging and meaningful.

3.2 Meaningful Gamification

The aim of creating meaningful and effective gamified systems is to introduce games as the opposite of scoring elements. To encourage users, it needs more than a numerical core system or badges attached to an activity (Nicholson 2012). People want to be mentally and emotionally affected, therefore the intrinsic motivation of people needs to be addressed (Deterding et al. 2011; Schell 2008). Intrinsic motivation is defined as the doing of an activity for the pure enjoyment of the activity per se, rather than of its rewarding value, pressure or external stimulates (Ryan and Deci 2000). Gamification tries to address this intrinsic motivation by applying game design thinking in order to engage people into meaningful and effective activities.

Hence, companies need to have an understanding of the activity, which is aimed to be designed as a gamified system in order to employ game mechanics in the right way and for the intended purpose. Nicholson (2012) suggests the integration of a user-centred design (UCD) approach to identify player's interests, social boundaries and competences. The UCD should result in a positive change of the system, which is perceived as a benefit to the user supporting his or her individual interests, but also working towards a behavioural change of the players in order to benefit the company. Implementing a standardised gamified system will rather cause negative feelings among the players as it is perceived as a surveillance of behaviour (Nicholson 2012).

Adopted from self-determination theory Ryan and Deci (2000), Schell (2008), Deterding (2011) and McGonigal (2011) created a taxonomy of intrinsic rewards which draw on the creation of meaningful choices and therefore are meaningful to the user per se.

Intrinsic rewards fall into the following major categories:

- *Relatedness* is the need to interact and connect with other players within the same interest group, such as friends linked to the same gamified system or related social systems, to share achievements and to be recognised among peers. Therefore, it is important to connect and to customise personal goals to a meaningful story such as a brand story or customer experience stories in order to embed the right game elements supporting the story visually and actively. McGonigal (2011) defined this category as 'social connection' which has a major impact on one's happiness as social contacts are a fruitful source to share experiences, build bonds and create memories.
- *Competence* gives the player the feeling to have the abilities in mastering the system and achieving goals. These goals should be clear, visual, varying and well-structured to provide motivation and optimism about one's own chances and possibilities. A satisfying and flowing activity arises from the division of long-term goals into smaller achievable goals. The challenge for game designers is to create a flow experience (Csikszentmihalyi 2008) and vary the difficulty within the flow channel to neither under nor over challenge the player. Even though failures are required to improve the game experience, the player needs to have enough positive feedback to be encouraged for gameplay.
- *Autonomy* is the freedom of the player to voluntarily join a gamified system and drop out at any time. If the player realises himself losing autonomy and being controlled by the gamified system it will lead to a de-motivating experience and not inspire further gameplay (Deterding et al. 2011; McGonigal 2011; Schell 2008).

Addressing the intrinsic motivation of a person is the most powerful motivator of gamification, as it leads to deep engagement into activities and with other people. Intrinsic rewards beat extrinsic rewards. A company's ability to create a meaningful and effective gamified system will open the prospect of happy customers and committed employees. A well-designed gaming mechanics refers to both intrinsic and extrinsic motivation through gaming elements.

4 Application of Gamification in Tourism

Knowing the benefits of using game elements and game design thinking in a different context, there are many possibilities in applying gamification. According to Hamari (2013), gamification has three main application areas: (1) motivation, (2) psychology and (3) behavioural outcomes. Especially with the purpose of increasing motivation and engagement, gamification is applied in *healthcare and*

fitness for prevention, therapy, education and rehabilitation in order to personalise healthcare and make processes in health more engaging (McCallum 2012). Healthmonth.com for example is a website using game elements, and game thinking in combination with social networking in order to improve the player's personal health. Besides, the area of *sustainability* has recently experienced a wide number of gamification examples to encourage people changing their behaviour towards a more sustainable lifestyle. Popular examples are the world's deepest bin and the bottle band arcade machine that should help to take care of our environment (Volkaswagen 2009, Gamification Wiki 2013). *Business and project management* also provides a good application area for gamification particularly to foster decision making processes. The intentions of using gamification in business are encouraging collaborative decisions, communication, work efficiency and identifying an effective communication mix (enterprise-gamification.com).

4.1 Gamification in the Tourism Context

The tourism industry is a service industry, which greatly emphasises on experiences co-created by tourists and service providers (Vargo and Lusch 2008). The level of consumer integration in the value creation depends on how tourism organisations empower tourists to play a role in new product development. Within service systems, tourists interact with tourism companies for the experience co-creation. Gamification can be applied in two ways in these systems. The concept can be used either to encourage customer engagement and enhance the experience or to improve employee engagement within an organisation (Huotari and Hamari 2012). The aim of applying gamification in tourism falls into two groups. First, gamification shall increase the motivation of tourists and employees in order to gain a behavioural change (buying products, work efficiently). Second, gamification shall enable tourists and employees for a value co-creation and thus provoke an intrinsic motivation.

4.2 Examples of Gamification in Tourism

Gamification is mostly used in the areas of health and well-being, motivation for sports, sustainability awareness and personal finance. However, gamification can be used by tourism organisations for marketing, sales and customer engagement (external application) or in human resources, training, productivity enhancement and crowd sourcing (internal application). Table 2 gives some examples of where gamification is applied in different tourism industries. Compared with other fields, the use of gamification in tourism is still in its infancy. Therefore, the examples provided here are based on the following criteria: (1) available via Google search when entered the term 'gamification' and 'tourism', (2) use at least two gaming elements and (3) being related to the tourism industry.

Table 2 Examples of gamification in tourism

Industry	Company	Case description	Gaming elements
Airlines and Transportation	American Airlines	Gamified mobile app represents current elite status qualification visually (American Airlines 2013)	Progress bar points Levels (gold, platinum, executive platinum)
	Turkish Airlines	QR-coded national flags have been placed on 100 digital bus shelters for London 2012. Users who read the code can win a ticket to Australia. Goal is to have most check-ins in one place or individual places (Duncan 2012)	Physical rewards Badges
Retail and Hospitality	Shopkick	Users are engaged with products by applying game mechanics for incentivising offers prior to shop visits. The gamification also involves a geo-targeted approach to drive local engagement. The aim is to influence buyers' behaviour via game mechanics (Edwards 2011)	Virtual currency Rewards Contests
	Starwood SPG program	Partnership with Foursquare to provide customers 250 bonus points per check-in and chances to unlock a hidden Free Resort Night Award (Vittal 2011)	Point system Badges
	Marriott My Hotel	Aim of the social media game is to recruit new staff for job vacancies and familiarise players with various parts of a hotel (MyMarriott 2012)	Point system Levels Virtual goods
Destination	Four-square	Users can claim mayor ships, unlock badges, receive special offers and rewards such as discounts to specific retailers while also tracking against friends via a leaderboard while checking-in at a restaurant etc. (Vittal 2011)	Badges Leaderboard Reward with real world offers

4.3 Benefits of Gamification in Tourism

Onto the limitations in length of this paper, only the external dimension of the benefits will be discussed here.

Encourage tourist engagement: Game design researchers (Brown and Cairns 2004; Ermi and Mäyrä 2005; Jennett et al. 2008) outline engagement as one dimension of game experience, which can be related to multiple concepts such as flow, motivation, pleasure, immersion, enjoyment and presence. The enjoyment of playing games (Klimmt 2003) and the desire to continue playing to test one's own abilities (Brown and Vaughan 2009) results in the addiction of gameplay. Game loops are critical in game play as they provide the feedback in the form of achieved points, badges and levels on the player's abilities. These engagement loops involve the player more and more into gameplay, elicits different types of emotions (hope, fear, excitement) and evokes a social call to action that the player becomes re-engaged into the gameplay (Zichermann and Cunningham 2011).

Enhance tourist experiences: Tourism, as an experience economy, provides a multi-dimensional and multifaceted offer of experiences (Kim et al. 2012; Neuhofer and Buhalis 2012; Ritchie and Hudson 2009). However, tourism experience literature does not cover essential dimensions of intrinsically interactive motivation, social play, challenge, fantasy and fun, which is provoked by using game design elements and game thinking (Deterding et al. 2011).

Improve tourist loyalty: Loyalty programmes can support strategic objectives in tourism relationship marketing (Campon et al. 2013) based on quality, value and satisfaction (Oh 1999; Petric 2004; Salegna and Goodwin 2005). However, researchers argue a more dynamic model of building customer loyalty is needed (Cronin 2003; Donnelly et al. 2008). Gamification can transform customer's loyalty to a new level by developing interactions between the customer and the system (Clanton 1998; Crawford 2011) but also between different users of the same system (Schiano and White 1998). One of the most known gamified systems is probably frequent flyer programs and destination loyalty cards (Zichermann and Cunningham 2011).

Increase tourism brand awareness: many companies (e.g. Pizza Hut, KFC, McDonald's, 7UP and Diesel) use games for placing their advertisements (gamerlimit.com). According to Celtek (2010) games are used in three ways for advertisements. First, *advergames* are branded games or sponsors for a game: a game is specially produced for the purpose of branding and advertisement to aim for a strong recall of the game. Examples of such advergames in the tourism industry are "Ireland Town" from the National Tourism Development Authority of Ireland or "Holmenkollen Ski Jump" from Visit Norway. Second, *in-game placements* are a placed logo or brand's name inside an existing game, which creates many opportunities to interact with the player. A good example from the hospitality industry is the integration of Starwood's loyalty programme into Foursquare, which now gives the tourist the opportunity to take advantage of

special promotions or share check-ins and travel tips with their social network. Third, *on-site advertisements* are the placement of banners and other media on gaming websites.

5 Challenges of Gamification

With the implementation of gamified systems into business and society, companies have to be aware of challenges initiated by the over-gamification of life. As discussed, gamification is not all about giving out badges and points to incentivise behaviour, but needs to apply game thinking to encourage and motivate for further activities.

Pointsification is the implementation of scoring systems into real life, which might lead to a fatigue of collecting badges, points and trophies for its own sake. The conflation of game elements neither reflects the essence of games nor real life. Instead, game systems need to offer meaningful choices, which involve loss and gain that are the source of the real game experience driven by mastery, learning and challenges. Besides, pointsification may cause an 'overjustification' effect (Lepper et al. 1973) for voluntary activities.

The implementation of gamification into a healthy business system, named as *exploitationware*, might also harm the system and lead to a polar-effect. The over-enthusiasm of tourism decision makers following a trend that promises easy, cheap and replicable success and is therefore tempting but bears risks triggering annoyance among customers and employees. The implementation of scoring systems will not allow the user to fully understand the meaning and motive behind, but instead be perceived as a control and monitor tool (Bogost 2011; Werbach and Hunter 2012).

Designing meaningful gamified systems is challenging and needs the knowhow of game designers to decide which activities in tourism and hospitality are suitable for being 'gamified' (Nicholson 2012; Robertson 2010). Thus, the prerequisite of implementing gamified system is a transparent communication of the purpose to support a voluntary participation of players.

6 Conclusion and Further Research

This paper critically reviews the gamification trend, the concept of gaming and gamification, intrinsic and extrinsic motivation of gamification elements and benefits of gamification. It also provides some examples of the wide use of gamification in the tourism industry. Through the literature review, a conclusion can be made that gamification is a significant, emerging trend for the coming years. More and more organizations are adopting gamification elements into their day to day business. Organisations are increasingly using gamification to motivate their

employees for better results and engage current and future customers into their business. The benefits of gamification include increased user engagement, improved customer loyalty, expanded brand awareness and enhanced customer experience.

The widely used gamification includes the application of extrinsic elements, such as points, badges, leaderboard, virtual goods and levels. However, intrinsic elements, such as interaction, socialization (relatedness), competence and challenge are more effective than extrinsic elements. Currently there is very limited academic research in gamification in general, it is an under researched area in tourism specifically. Future research could include: (1) the implication of gamification in different sectors in tourism; (2) the inward (employee training) and outward (customer engagement) implication of gamification and (3) empirical studies on the effectiveness of how gamification contributes to tourist experiences and customer loyalty.

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Expectation of Travel Experiences with Wearable Computing Devices

Iis Tussyadiah

Abstract Based on a content analysis of textual data containing people's ideas to use wearable computing devices, this paper identified five patterns of personal motivations to use wearable devices for travel and tourism experiences. They are exploration, adventure tourism, travel documentation, travel reporting, and positive transformation. These patterns suggest a potential transformation in tourists' behaviour due to perceived new ways of interactions with technology and with the near surroundings. The different features and functionalities that are unique to wearable technology trigger changes in three areas: the shift from tourists to explorers, an explosion of first-person visual travel narratives, and more social travel supported by real-time connectivity. Further, the findings also suggest a potential shift in terms of how personal technology is situated in human experience, from mediation to embodiment.

Keywords Wearable computing · Tourism experience · Mediation · Embodiment

1 Introduction

Tourists' interaction with and consumption of the physical and sociocultural attributes of tourism destinations is the central factor that defines tourism experience. In that, a meaningful tourism experience is a result of meaningful encounters between tourists and the unique characteristics of the places they visit. Today, tourism experiences are getting more and more mediated by the use of information and communication technologies (ICT) (Tussyadiah and Fesenmaier 2009). Indeed, recent research has conceptualized and identified that ICT has the

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capabilities to facilitate more meaningful interactions between tourists and tourist places and, therefore, to enhance tourism experience (Wang et al. 2012; Neuhofer et al. 2012). Tussyadiah and Zach (2012) identified how the use of geo-based technology such as navigation systems and online maps during traveling assists tourists to acquire geographic knowledge necessary for a better experience with places. Further, the use of context-aware technology, specifically combined with social network platforms on mobile devices, also supports new, creative encounters between tourists and attractions, businesses, and the social components of tourism destinations (Tussyadiah 2012).

More recently, triggered by the introduction of *Glass,* a wearable technology device developed by Google, Inc., wearable computing is considered the next disruptive technology that is anticipated to have a major impact on the ways people interact with their surroundings (Tate 2012). Indeed, the introduction of the device was responded with curiosity, excitement, and fear (Farber 2013), marking the challenges facing the integration of this technology into the society and culture. In the context of tourism, while smart mobile devices allow tourists to stay connected, well-informed and fully equipped for travel-related performances (e.g., information search, navigation, social networking, travel reporting, etc.), almost hands-free wearable devices such as *Glass* are expected to enable these processes to be even more immediate, less cumbersome (e.g., allowing people to look ahead instead of down on a mobile phone screen), and rather surreptitious. Many have speculated how *Glass* will revolutionize tourists' behaviour and the tourism industries (Dickey 2013; Prabu 2012), specifically in the areas of guiding with augmented reality and information overlay, travel reporting with first-person view (FPV), and instant navigation. In order to better understand the potential transformation of tourism experience with wearable computing and its implications to destination marketing and management, it is important to explore people's expectation of use of this device in the context of travel and identify the expected behavioural changes and modifications in tourists' interactions with places and others while traveling. The goal of this study is to identify and explore the expectation of use of wearable computing technology for travel-related experiences. Particularly, this study analyses people's ideas and imagination of experiences with tourist places using *Glass* and its functionalities.

2 Personal Technology and Tourism Experiences

Recent studies in tourism and ICT has identified the important roles of personal technology such as personal computers, tablets, and smartphones in travel experiences (e.g., Tussyadiah 2013; Wang et al. 2012). These roles are associated with enablement (i.e., making certain experiences possible, such as provision of vicarious experiences through virtual reality technology) and facilitation (i.e., enhancement of experiences, such as provision of assistance through information and recommendation). The facilitative role of technology in tourism experience is

conceptualized as technology mediation, suggesting that technology can assist tourists by providing and/or limiting access to certain experiences. In other words, in the process of mediation, personal technology is situated in between users and artefacts, which can be clearly illustrated in the context use of mobile phones for tourism experience (Tussyadiah et al. 2008). However, recent development indicates that personal technology will become wearable, implying the potential changes in the ways users interact with technology and with others. Hence, an alternative theoretical explanation is necessary to illustrate the role of personal wearable technology in tourism experiences.

Recent human–computer interaction (HCI) studies link the concept of embodiment to user experiences with wearable computing, especially in the contexts of embodied interaction with artefacts and near surroundings. Ihde (1990) suggests the non-neutrality of technology-mediated experiences. He argues that technologies appear in between humans and the world and change human experiences, enhancing some aspects while reducing others. While technologies mediate human experiences, they also transform these experiences. He explains embodiment of technologies in the use case of seeing the world through glasses. Initially, glasses are in a mediating position between user and the world. However, as glasses are embodied by the user, there is a technology "withdraw" in which they become unnoticeable, but an essential part of the seeing experience, as illustrated in Fig. 1. Embodiment of technology results in a symbiosis of technology and user within human actions. As the seeing experience is mediated by optical technologies; the user is experiencing "seeing through glasses," which, in itself, is a transformed experience.

Importantly, embodiment is associated with the role of the body in human actions. Ehn and Linde (2004) asserts that people describe things in relations to their bodily capacities (e.g., tall buildings, crowded streets, big cities), especially when they perceive the surroundings and perform certain activities in spaces. Embodiment of technology is believed to be able to extend the perceptual bodily sense of the users (Ihde 1990) as technological capacities are integrated into users' skills. For example, a driver extends his/her bodily capacities through the "body" of the car when navigating through the highway or at a parking lot.

The concept of technology embodiment is relevant to wearable computing technology such as *Glass*. A total embodiment of wearable computing devices will allow them to "disappear" (i.e., a technology withdraw) as they become a part of the user in certain experiences. As users become tourists, wearable computing devices mediate their experiences with the destination. Depending on the destination contexts, interactions between tourists and wearable computing devices can become important in shaping the tourism experience. However, as tourists actively embody the devices, they can become inseparable from and extend the bodily sense of the users. The acts of seeing a tourism attraction (i.e., user-artefact) and searching for information regarding the attraction (i.e., user-technology-artefact) are no longer considered separate as wearable computing devices enable tourists to see the attraction through a different lens with layers of relevant information (i.e., [user-technology]-artefact).

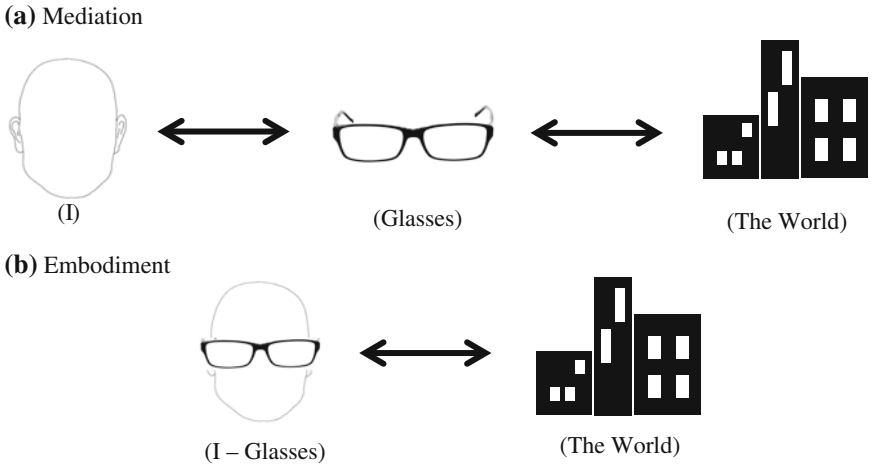

Fig. 1 Technology mediation and embodiment (adapted from Ihde 1990)

3 Methodology

Through an initiative called Project Glass, Google, Inc. held a contest to give an opportunity for potential early adopters to purchase the Explorer Edition of Glass by submitting how they would use Glass in a post on social networking and social publishing sites: Google+ and twitter using a hashtag #ifihadglass for the duration of one week from February 21 to 27, 2013. For this study, tweets (i.e., microblog postings on twitter) containing this hashtag were harvested from twitter developers application programming interface (API) by creating and running a programming script on Google Documents from February 23 to 27, 2013 to explore potential users' expectation of Glass use for travel-related experiences. This effort resulted in 17,373 tweets. Duplicates (i.e., the same messages posted repeatedly by the same twitter users) and irrelevant tweets (e.g., twitter users using the trending hash tag to post irrelevant messages) were eliminated through manual data management using Microsoft Excel, resulting in 10,035 unique tweets. At a later date, a complete twitter submission list for the contest was published on a Google Fusion Table, containing a total of 13,611 tweets. Hence, the total number of tweets used in this study represents approximately 74 % of the overall submission on twitter.

At an initial stage, an open coding procedure following a standard content analysis (Kassarjian 1977) was conducted using a text analysis software, Atlas.ti, to identify submissions that are relevant to travel experiences. All tweets were carefully read and coded employing a descriptive coding procedure. Three codes related to travel experiences emerged: "travel," "adventure," and "destination." This effort resulted in 930 unique tweets to be included for further analysis. In order to explore and extract the themes from the text referring to the potential use of Glass for travel and tourism, several analytical processes related to product use

and intention were consulted to guide the abstraction level of the content analysis. A relevant conceptual framework was found in Means-End Theory (Gutman 1982), which stipulates that individuals make product choices based on deeply held personal values. Specifically, Means-End Chain Analysis suggests that consumers relate to products in a hierarchy consisting of three levels: product attributes (A), consequences of use (C), and personal values (V) (Perkins and Reynolds 1988; Reynolds and Perkins 1987). Research applying Means-End Chain Analysis typically applies laddering interviews, relying on interviewer–interviewee interactions to gather consumer information regarding how they translate product attributes into meaningful associations with themselves (Grunert et al. 2001). The results are then presented in A–C–V chain to explain the extent of relationships between product attributes and personal values based on co-occurrences of the three dimensions within consumer responses. However, since this study uses an organic form of textual responses, most of the collected tweets do not contain all three dimensions of the means-end hierarchy (i.e., co-occurrences of A, C, and V are not always explicitly present within a tweet). Hence, it generates a limitation to measure the extent of A–C–V relationships. To that end, this study adopts the conceptual framework in Means-End Theory to identify the consequences of use of Glass based on its features and functionalities and to explain the relationships of such use with personal motivations and values, but it does not seek to measure the extent of these relationships. In other words, to achieve its goal, this study relies on an interpretation of qualitative information regarding A–C–V relationships rather than quantitative measures to estimate their extent (i.e., frequencies, number of occurrences, etc. are interpreted, but not calculated to generate summation, averages, etc.).

Specifically, the conceptual framework in Means-End Theory serves to guide in identifying emerging themes from the tweets during content analysis. The three dimensions were interpreted into three pre-set code families. Product attributes are comparable to features and functionalities of Glass perceived by its potential users (code family: "Attribute"), consequences of use are the different use activities of and/or facilitated by Glass (code family: "Activity"), and personal values are the motivation behind such use (code family: "Motivation"). Emergent codes within the code families are then refined and reorganized to consolidate meanings and explanation; code-to-code relationships and associations were interpreted. The next step was to reflect back on the tweets and the refined codes to identify patterns (i.e., repetition and/or consistencies of actions), categories, and themes by finding similarities, differences, sequences, correspondences, and causations (Hatch 2002; Saldana 2009). The last step is to systematically link the patterns, categories, and themes identified from the data to a broader, higher-level concept.

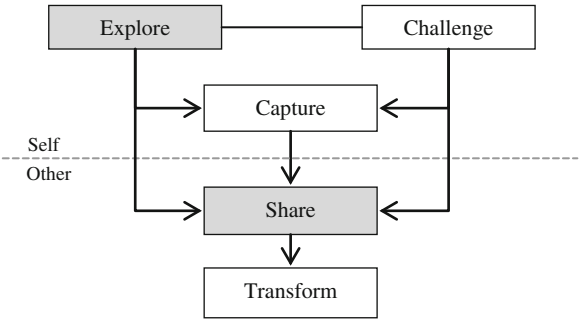

Fig. 2 Motivations to use *Glass* for travel experiences

4 Results and Discussion

The content analysis resulted in five categories representing patterns of motivation to use Glass for travel-related experiences: "Explore" (i.e., using Glass to explore and experience different places around the world), "Challenge" (i.e., using Glass to challenge self with adventures and extreme activities), "Capture" (i.e., using Glass to record and document travel experiences), "Share" (i.e., using Glass to connect and share travel experiences with others), and "Transform" (i.e., using Glass to make a positive change in the society through travel experience). It is important to note that these patterns should not be interpreted as motivations to travel, but motivations to use Glass for travel. Figure 2 illustrates these patterns and the connections among them. The dotted line indicates the different orientation amongst the personal motives: the first three patterns suggest more self-oriented motivations, which include entertainment and self-enrichment, while the last two patterns suggest an orientation to others (i.e., a desire to connect, include, help or change others through own travel experiences). "Explore" is a prevalent theme suggested in the self-oriented tweets, while "Share" is the prevalent theme of other-oriented motivation. These patterns of use indicate potential changes in travel behaviour due to the perceived new ways of interactions afforded by the different functionalities of Glass, including interpersonal interactions and user interactions with near environments. These patterns are elaborated further in the following subsections.

4.1 Wearable Computing and World Exploration

The first and most prevalent motivation to use Glass for travel experiences is the desire to explore different places around the world and to experience new things. The keywords used in tweets under the "Explore" theme are "travel," "explore," "trip," "world," and specific mentions of a destination. The individuals' desires to explore the world imply an important shift from the motivation to be a tourist

(i.e., to visit a place) to that of being an explorer (i.e., to involve in a deeper exploration of a place, learn different culture, connect with locals, etc.). This is supported by the relationships between "Explore" and other emergent codes within the "Activity" and "Attribute" families. Travel-related activities associated with the motivation to "Explore" are "Culture," "Biking (Tour)," "Motorcycling (Tour)," "Hiking," "Road Trip" and "(Sightseeing) Tour." Additionally, the perceived functionalities of Glass that are associated with "Explore" are "Navigation" (including map), "Information" (including augmented reality), and "Translation." The associated activities and functionalities of Glass seem to suggest that people expect Glass to facilitate them with new ways of interacting with others and with the environments, which result in a deeper, more meaningful interaction with places (See Excerpt 1;) through enhanced information, instant translation to bridge language barriers with locals, and instant navigation while traveling. Another important suggestion emerging from this theme is the emphasis on the enjoyment of the journey itself (i.e., walking or using personal modes of transportation) instead of a sole focus on destination experience. Many tweets suggest plans to take a road trip or to ride a motorcycle across different states and meet and greet people on the way (See Excerpt 2).

Excerpts 1:

> [If I had Glass] I would use **it** with an AR [Augmented Reality] app to enhance my exploration of European cities. Look at a building, read its history. – ColinEnglish (February 27, 2013).

> [If I had Glass] I would travel around the world without care about unknow[n] languages. **My glasses** could translate for me. – kikolive (February 27, 2013).

> [If I had Glass] [I] Would shoot, record, translate [and] navigate places w[ith] them *as I travel to create a short film series exploring our world cultures* […]. – mascottlabs (February 27, 2013).

Excerpts 2:

> [If I had Glass] [I would take a] road trip from Seattle to Chicago for the best slice of pizza in town, and have **it** direct me to interesting stops along the way […]. – Quintious (February 27, 2013).

> [If I had Glass] I would spend the summer traveling across the country, video interviewing strangers about their lives and their passions… – MichaelKovich (February 24, 2013).

> [If I had Glass] I would travel through Venezuela in my 125 cc motorcycle, showing places, the experience and every detail of the trip! – jpserranoguada (February 25, 2013).

4.2 Wearable Computing and Adventure Tourism

One of the revolutionary impacts expected from the use of Glass is in adventure tourism as reflected in tweets containing activities such as skydiving, bungee jumping, mountain climbing, parasailing, etc. This motivation to challenge oneself to partake in more adventurous outdoor activities and extreme sports could be inspired from the Glass introduction video published by Google, Inc. containing first-person images captured with Glass. However, it is important to note that the tweets containing the "Challenge" motivation also have extremely high co-occurrences with the desire to share the adventure with others, which is enabled by the new capture and share functions unique to Glass. In other words, while most twitter users indicated the need to challenge themselves to climb Mt. Everest or to skydive, it is the idea that the action could be captured in FPV and shared in real time (i.e., live streaming) that makes the motivation even stronger (see Excerpts 3). In terms of functionalities, the pattern "Challenge" is associated with "FPV," "Navigation," "Information," "Real Time Connectivity," and "Social Publishing," which includes blog, vlog, and video streaming.

Excerpts 3:

> [If I had Glass] I would climb Mt. Kilimanjaro. #bucketlist. – Ross_Hagan (February 27, 2013).
>
> [If I had Glass] I would snowboard, skydive, take a video on top of one of Colorado's 14ers and go on a road trip across America! – OCDelRio2 (February 27, 2013).
>
> [If I had Glass] when I go skiing I could take videos instantly of me on the slopes and I could also find my way back with directions if lost… – sanjanagoogle (February 24, 2013).

4.3 Wearable Computing and Travel Documentation

A great amount of tweets put an emphasis on documenting travel experiences driven by the convenience offered by the use of wearable computing (i.e., hands-free image capturing without getting in the way of experience) and the capability of capturing point-of-view images (i.e., as an alternative to head-mounted cameras). The pattern has a strong connection with "Share," implying that personal travel documentation does not only serve the purpose of storing personal memories, but also serves as experience reporting for others (See Excerpts 4). In terms of activities, "Capture" is associated with outdoor sports and other journey-related activities such as "Biking," "Skydiving," "Skiing," "Hiking," and "Road Trip." In terms of perceived functionalities, the pattern is associated with "FPV," "Social publishing," and "Real-Time Connectivity."

Excerpts 4:

> [If I had Glass] I'd document [and] share my 110 mile backcountry ski trip through the Alps on the Haute Route this March […] – johnharrington (February 26, 2013).
>
> [If I had Glass] a day at the beach could be recorded and saved for a rainy day […] – iCandy4yOuXoXO (February 27, 2013).
>
> [If I had Glass] I would record my monthly hiking expeditions from my perspective so I can stream it for nature lovers online! […]. – JoeGo132 (February 27, 2013).

4.4 Wearable Computing and Travel Reporting

The "Share" motivation has strong connections to all other patterns. The desire to share travel experiences with others can be expanded into distinct sub-themes that indicate deeper personal values: (a) the value of showcasing personal experience and perspective to others (i.e., self-esteem), (b) the value of experiencing things together with others, albeit indirectly (i.e., belonging), and (c) the value of enabling others to experience places and things (i.e., altruism), by opening access to travel experiences for others with limited mobilities (e.g., people with disabilities or other travel restrictions) (See Excerpts 5). "Share" is associated with activities that are captured in adventure and exploration as well as these functionalities: "FPV," "Real-Time Connection," "Social Publishing," "Information," and "Navigation."

Excerpts 5:

> [If I had Glass] I can finally show others what it feels like to fly from NYC to Thailand by yourself at 19 years old, on a whim. – thedansper (February 26, 2013).
>
> [If I had Glass] I'd take **them** on my next ski trip to Salt Lake City so my roommate (just lacerated his spleen) can experience the slopes too! – AustinMcPhilli1 (February 25, 2013).
>
> [If I had Glass] I'd use **it** to stream my next trip to Japan so I can finally bring my disabled father with me. – rsuttong (February 26, 2013).
>
> [If I had Glass] I would use **it** to take my family and friends to places and experiences they could never reach on their own in their lifetime. – jessefifer (February 25, 2013).

4.5 Wearable Computing and Positive Transformation

A handful of tweets reflects a personal value that transcends the motivation to travel for enjoyment and self-enrichment, to spreading influence that leads to positive societal transformation. Many twitter users posted ideas of sharing images and experiences to the world to promote mutual understandings and to encourage cross-cultural learning. Others see the ability to travel and to share travel experiences as a way to make a difference; showcasing the kindness they encounter

along the way means inspiring others to embrace positive behaviour (See Excerpts 6). The pattern "Transform" is strongly associated with the motivation to "Explore" and "Share," "Culture" activities, and "FPV" functionalities.

Excerpts 6:

> [If I had Glass] I'll explore the world. When [I] explore, [I] interact. When [I] interact, I change. [If I had Glass] I [would] make the world to better place. – olzas (February 24, 2013).
>
> [If I had Glass] I would help change the world by showing everyone all the different countries. – kjstog (February 24, 2013).
>
> [If I had Glass] I'd share my unique perspective of the world on [website] so people can learn and be inspired by other cultures! – citygalKLC (February 27, 2013).
>
> [If I had Glass] I would be able to more easily document an around the world bike trip to raise money and awareness for breast cancer research. – MontyHendrixson (February 27, 2013).

4.6 Wearable Computing: From Mediation to Embodiment

Based on the five patterns representing different drivers of potential use of Glass for travel and tourism experiences and their associations with travel-related activities and perceived functionalities of Glass, a chain connecting the attributes of Glass to the values held by its potential users is illustrated in Fig. 3. The abstraction level adapted from Means-End Theory assisted in not only identifying Glass attributes that potential users perceived as important for their personal experiences, but also defining the associations between the perceived attributes and user values. Key differentiations of wearable computing technology that potentially transform user behaviour are: (1) instant information and translation, which include overlay and augmented reality as well as location-based data for navigation and directions, (2) hands-free capturing of images with first-person perspectives, and (3) real-time connectivity with social networks. Instant information makes more equipped and informed tourists, stimulates more meaningful interactions, and creates more convenience and confidence for being out in the world (i.e., Glass as an extension of the mind). Eventually, this stimulates the motivation for exploration (e.g., cultural activities, road trips and other journeys). The unique perspectives captured by the face-mounted device generates interests in producing (and sharing) FPV videos and pictures of extreme activities such as bungee jumping and skydiving (i.e., activities that challenge oneself). Lastly, real-time connectivity drives potential users to develop and maintain social connection with others, stimulating the social needs of belonging as well as altruism. Most importantly, the combination of these functionalities (i.e., allowing users to safely explore, capture different perspectives, and simultaneously share) stimulates the will to make a difference in the world.

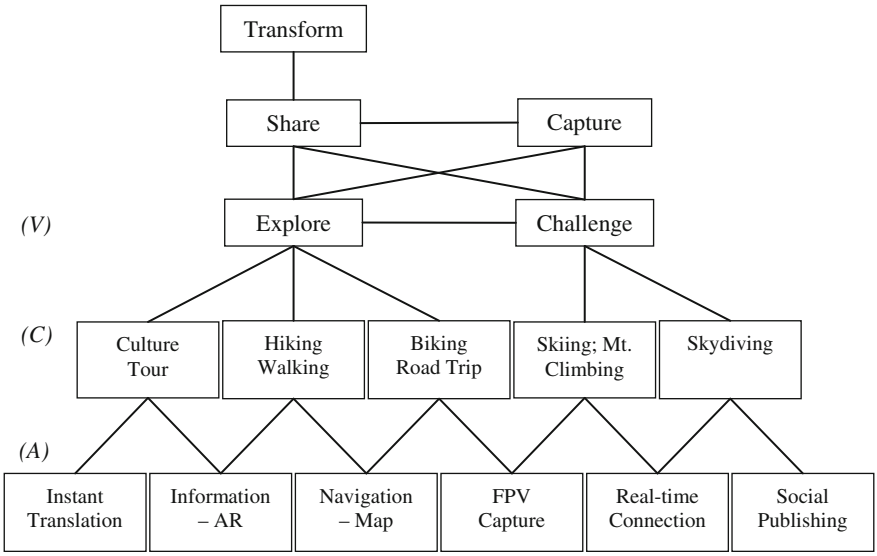

Fig. 3 Abstraction of attributes (*A*), activities (*C*) and motivations (*V*) of *Glass* use for travel

The identified patterns of expected use of *Glass* also suggest different patterns of user-technology interactions as well as patterns of interaction between users and near surroundings. The ways potential users describe the activities related to exploration, for example, suggest that while potential users still view the device as having a mediating role (represented by the explicit mention of using the device for a particular activity), most potential users describe their expectation of use as if the device is becoming a part of themselves or an extension of their bodily and cognitive senses. For example, *tweets* in Excerpts 1 refer to expectation of users turning into the device to help them navigate places or translate foreign languages (i.e., "I will use [*Glass*] to…"). These seem to indicate the process of mediation, where users interact with technology to assist them in interacting with near surroundings. The majority of other *tweets*, however, suggest the idea of a technology withdraw by making references to themselves and the new things they *could* do (e.g., in Excerpts 6). Some *tweets* also suggest the perceived extension to potential users' sense of the body and the mind (i.e., "Seeing through *Glass* eyes…"), confirming the relevance of technology embodiment in the context of wearable computing.

5 Conclusion and Implication

The aim of this study is to explore the potential use of wearable computing devices for travel and tourism experiences and to identify potential changes in terms of the roles of personal wearable technology in assisting tourists while interacting with

others. The conceptual framework in Means-End Theory guided the abstraction of the data to identify perceived functionalities or attributes of Glass, consequences of use for different types of travel-related activities, and the drivers of such use. Lastly, the theoretical framework of technology mediation and embodiment was consulted to define the changing roles of technology in human experiences as it becomes a part and extension of human bodies and cognitive abilities.

Wearable computing encourages exploration of places supported by the connectivity and possibilities to navigate, retrieve, consume and layer information (i.e., with augmented reality) while exploring tourism destinations. Well-informed tourists (with extended cognitive abilities) will be able to roam around the destinations independently, enjoy en-route experiences (e.g., road trips, motorcycle trips, etc.), and explore unfamiliar places. This indicates a shift from "tourists" to "explorers," which will transform not only the management of destination attractions in terms of tour programming, guiding, and information provision for tourists, but also the emphasis of the many facets of destination experience as well as space–time relevant recommendation systems for marketing purposes. These findings confirm and extend the findings from previous research on the mediation of personal technology in tourism experiences (Tussyadiah and Zach 2012; Wang et al. 2012).

Wearable computing encourages the production of first-person visual narratives of personalized travel experiences. This will re-emphasize and give new meanings to word-of-mouth marketing as the abundance of personal travel videos will potentially shape the micro-segmentation approach to destination marketing (i.e., a push to rely more on personas other than traditional methods for segmentation and targeting). These findings reaffirm the importance of first-person narratives in destination marketing (Tussyadiah and Fesenmaier 2008; Tussyadiah et al. 2011). Also, wearable computing facilitates social connection trough real-time connectivity with family and friends (e.g., using Google+ Hangout simultaneously while consuming tourism destinations) and elimination of cultural barriers between tourists and locals. This will give tourists the feeling of safety and ease of interpretation of tourism attractions and other resources within the destinations.

Despite the contribution to identify potential changes in travel behaviour with the use of wearable computing devices, there are limitations in this study. Due to the nature of data elicitation where twitter users posted the ideas to win a competition, the results should be interpreted as people's perception of a creative use of Glass. The indication of behavioural changes within these tweets reflect the supposition that the activities suggested were considered revolutionary for them. In order to assist in generalizing the findings, a follow up study exploring the real use of Glass for tourism experience is suggested.

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Smart Tourism Destinations

Dimitrios Buhalis and Aditya Amaranggana

Abstract The rapid development of technologies introduces smartness to all organisations and communities. The Smart Tourism Destinations (STD) concept emerges from the development of Smart Cities. With technology being embedded on all organisations and entities, destinations will exploit synergies between ubiquitous sensing technology and their social components to support the enrichment of tourist experiences. By applying smartness concept to address travellers' needs before, during and after their trip, destinations could increase their competitiveness level. This paper aims to take advantage from the development of Smart Cities by conceptualising framework for Smart Tourism Destinations through exploring tourism applications in destination and addressing both opportunities and challenges it possessed.

Keywords Smart tourism destinations · Internet of things · Smart city · Travel and tourism · Technology

1 Introduction

The rapid increase of urban population worldwide has triggered intricate challenges for cities around the world. City infrastructures are facing a massive pressure due to the fact that more than half of the world's population lives in the cities (Falconer and Mitchell 2012). As cities become increasingly competitive and complex, Information and Communications Technology (ICT) will coordinate all activities and services, leading to connected, better informed and engaged citizens.

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ICT make cities more accessible and enjoyable for both residents and visitors through interactive service interconnecting all local organisations to provide real-time services and use data centrally for better coordination.

The concept of Smart City represents an environment where technology is embedded within the city. This technology will synergise with city's social components in order to improve citizens quality of life while also improve city services efficiency, such as optimising the use of energy and better traffic monitoring (Vicini et al. 2012). Indeed, ICT supports cities in addressing their societal challenges. The development of Smart City also facilitates seamless access to value-added services both for its citizens and tourists as city visitors, such as access to real-time information on public transportation network. Further, Smart City has enable interconnectivity among city stakeholder through Internet of Things which allows cities to dynamically engage with their stakeholder (Vicini et al. 2012).

The new era of ICT has also opened a wealth of new tools for the tourism industry. Nowadays, tourism destinations face a set of new challenges arising from changes in both consumers and the environment as influenced by the emerging technologies. In order to deal with these challenges, first destinations have to recognise the kind of changes that occurred then proactively respond (Soteriades et al. 2007). From a tourism perspective, ICT could contributes in terms of generating value-added experiences for tourists, while also improving efficiency and supporting process automation for the related organisations (Werthner 2003 as cited in Gretzel 2011). Thus, the development of Smart City could also encourage the formation of Smart Tourism Destinations. With technology being embedded within the destinations environment, it can enrich tourist experiences and enhance destinations competitiveness.

While a majority of discussion present ideal images of Smart City, only few researchers have tackled Smart Tourism Destinations. This paper seeks to fill the research gap by identifying opportunities and challenges as well as conceptualising a framework for Smart Tourism Destinations towards enhancing destinations competitiveness.

2 Theoretical Background

2.1 Internet of Things

The Internet of Things (IoT) is rapidly gaining ground in the emerging world of ICT (Atzori et al. 2010). The term IoT was firstly coined by Kevin Ashton (MIT) in 1999. He defined IoT as a network that connect anything in anytime and anyplace in order to identify, locate, manage and monitor smart objects (Mingjun et al. 2012). The idea behind the IoT is to generate automatic real-time interactions among real world object that connect to the Internet which consequently also

reduce the gap between real world and digital realm (Erb 2011). Further, the development of mobile computing has also supported a plethora of applications namely combination between visual tagging of physical objects and Near Field Communication (NFC) devices that contributed to the development of the IoT (Borrego-Jaraba et al. 2011). Hence, IoT creates platforms that are able to transmit range types of data using a participatory sensing system (Gutiérrez et al. 2013). In a tourism context, tourists could simply use their mobile phones to explore the destination and events of interest using in-situ data collection and reporting. These activities leave massive size of digital traces resulting in multidimensional set of data which known as Big Data. By managing Big Data, tourism organisations could extract valuable insight from avalanche of information that could elevates them to a new dimension of customer experience and improves the way they interact with customer (SOCAP International 2013). Those who master this form of technology gain an abundant competitive advantage compare to competitors.

2.2 Smart City Characteristic

In marketing language, smartness is centred on a user perspective, which makes it more user-friendly than intelligent (Nam and Pardo 2011). Smart cities concept has typically been associated to technology embedded ecosystem that attempted to build synergies with their social components in order to enhance citizens' quality of life and to improve the efficiency of the city services (Egger 2013).

IBM defined Smart City as a city that make their system instrumented, interconnected and intelligent. Within this definition, instrumentation denotes that city activities are measurable by sensors that scattered around the city; interconnection means that every bit of a city are connected through ICT network both wired and wireless; and intelligence refers to predictive applications that have the ability to generate more accurate decisions (Komninos et al. 2013). Smart Cities have the ability to give intelligent response to various kinds of needs, including daily livelihood as well as city services and commercial activities that happen within the same time interval (Su et al. 2011).

A city could be categorised as smart when sustainable economic growth and high quality of life were achieved through investment in human capital, adequate level of government participation and infrastructure that support proper dissemination of information throughout the city (Caragliu et al. 2009). Thus, smart cities should base their smartness on three main pillars, namely: human capital, infrastructure/infostructure and information (Komninos et al. 2013). Human capital is the core element who actively participating in day to day activities and could potentially drive the city to be smarter (Bakıcı et al. 2013). In addition to human capital aspect, solid infrastructure in the form of optical fibre networks that covers the whole city is as important because it roles as city backbone of sensors installation (Komninos et al. 2013). Further, convenient access to an enhanced information flow for city stakeholder is deemed essentials to fuel their actions in

optimising city function and make it a better place to live in (Accenture 2011). Citizens of Smart Cities are empowered to understand the cost of living in real-time so they could make better decisions on how to allocate and effectively use the limited resources in the cities. Thus, the city should therefore directly involve citizens in the co-creation process of products or services (Bakıcı et al. 2013; Schaffers et al. 2011). To this end, Smart Cities are not only considered as the outcome of innovative process but also as innovation ecosystems that empower communities' co-creation for designing innovative living resulting in constant dynamic innovation and engagement with all stakeholders (Schaffers et al. 2011). Further, Boyd Cohen has developed Smart City Wheel as a tool to support the development of Smart Cities strategies as well as tracking their progress. Within this wheel, Cohen (2012) has defined few indicators for each of the smartness dimensions, namely (1) Smart Governance that relates with aspect of transparency within governance systems through modernisation of city administration by supporting data openness and public involvement; (2) Smart Environment which is related to energy optimisation that leads to sustainable management of available resources; (3) Smart Mobility which referred to accessibility within the city as well as outside the city and availability of modern transportation systems; (4) Smart Economy which is related to implementation of economic strategies based around digital technology; (5) Smart People which linked to the qualification level of city's human capital; and (6) Smart Living which involve the quality of life which measured in terms of healthy environment, social cohesion, tourist attraction and availability of cultural and educational services (Baudouin 2012). These characteristics are built based on smart combination of endowments and creative yet knowledgeable citizens that make sound management of available resources (Giffinger et al. 2007).

2.3 Tourism Destinations

There are several viewpoints in defining tourism destinations. In regard with its geographical area, tourism destination defines as an area that selected by visitors which encompasses all necessary amenities such as accommodation, restaurant and entertainment (Bieger 2005 as cited in Buhalis 2000). Meanwhile, definition of tourism destinations could also stress beyond their geographical limit to the extent that depends on tourists' origin motivation (Luft 2007 as cited in Buhalis 2000). As denoted by United Nations, the meanings of destination are lies under tourists' perception of a place that motivates them to take the trip (Lamsfus and Alzua-Sorzabal 2013). Further, Buhalis (2000) refers to destinations as amalgams of tourism products and services which exclusively produced and offer to the potential customer as an integrated experience. The linkage between one tourism products and another at destination level is vital because of the nature of tourism industry which are combination of multiple components served in several touch points that perceived by the customers prior, during and after their trip (Soteriades 2012).

Successful destinations can be structured as the 6As of tourism destinations: (1) Attractions which can be natural such as mountain; artificial such as amusement parks; or cultural such as music festival; (2) Accessibility refers to the entire transportation system within destination that comprise of available routes, existing terminals and adequate public transportations; (3) Amenities characterise all services facilitating a convenient stay, namely accommodation, gastronomy and leisure activities; (4) Available Packages refer to the availability of service bundles by intermediaries to direct tourists' attention to certain unique features of a respective destination; (5) Activities refer to all available activities at the destination which mainly trigger tourists to visit the destination; and (6) Ancillary Services are those daily use services which are not primarily aim for tourist such as bank, postal service and hospital (Buhalis 2000). It is deemed important for destinations to properly maintain each of their 6As to be highly competitive in the industry. However, with consumers taking over the process of co-creation, destinations need to realise that conventional approach has become obsolete and they need to interconnect all their stakeholders to facilitate a dynamic co-creation process to increase destination competitiveness (Neuhofer et al. 2012).

3 Smart Tourism Destinations

Bringing Smartness into Tourism Destinations requires dynamically interconnecting stakeholders through a technological platform on which information relating to tourism activities could be exchange instantly. This integrated platform is having multiple touch points that could be access through a variety of end-user devices which will support the creation and facilitation of real-time tourism experiences and improve the effectiveness of tourism resources management throughout the destination at both the micro and macro level. Smart Tourism Destinations take advantage of: (1) Technology embedded environments; (2) Responsive processes at micro and macro levels (3) End-user devices in multiple touch-points; and (4) Engaged stakeholders that use the platform dynamically as a neural system. The ultimate aim is to utilise the system to enhance tourism experience and improve the effectiveness of resource management towards maximising both destination competitiveness and consumer satisfaction while also demonstrate sustainability over an extended timeframe.

There are three forms of ICT which are vital for setting up Smart Tourism Destinations, namely Cloud Computing, Internet of Things (IoT) and End-User Internet Service System (Zhang et al. 2012 as cited in Wang et al. 2013). The Cloud Computing services are designed to provide convenient way to access solid web platform and data storage through certain network. The use of Cloud Computing is going to reduce fixed costs and shift them into variable costs based on the necessities (Etro 2009). It also stimulates information sharing that is fundamental to undertake Smart Tourism Destinations project. For example, a sophisticated tour guide system could serve massive number of tourists without being actually

installed on any personal device (Zhang et al. 2012 as cited in Wang et al. 2013). Second, the IoT could support smart destinations in terms of providing information and analysis as well as automation and control (Chui et al. 2010). For example, chips embedded to entrance ticket allow tourism service providers to track tourists' locations and their consumption behaviour so that location-based advertising could be executed (Lin 2011). As for automation and control, the system could control visitor number within specific tourism sites by using variety of sensors in regard with each sites' carrying capacity (Mingjun et al. 2012). The third component of a smart destination is the End-User Internet Service System, which refers to number of applications at various levels supported by combination of Cloud Computing and IoT. For example, Barcelona had established Project LIVE that concerning on the creation of innovative hub for electrical vehicles. LIVE's charging points map could be accessed remotely via Apple's iPhone and Google's Android to check all the availability status of vehicles' charging points (Jung 2011). However, proper connectivity is the base enabler to run these three core forms of ICT in Smart Tourism Destinations. In this regard, it is important for the government supported by various stakeholders to maintain adequate network coverage within the city to avoid gap between commercially dense area and rural area.

Smart Tourism Destinations should also perform smartness by implementing appropriate tourism applications within Smart Cities' components as defined by Cohen (2012). A range of smart services can be seen on Table 1 which shows how 6As Destination Components (representing destinations element) and Smart Tourism Destination Dimensions as derivate from Cohen's Smart City Dimensions (representing smartness element) could be combined and possibly generate tourism applications with each of its utility function to be implemented in Smart Tourism Destinations.

Progressing towards the smartness concept, Stockholm collects real-time information from scattered sensors in the city and processes them in order to provide accurate city information through end-user devices; which reflect the use of ICT as a predictive tool to implement a smarter way of managing Tourism Destinations (Achaerandio et al. 2011). Broadly foreseeable changes caused by smartness immersion in tourism destinations build characteristic of Smart Tourism Destinations, though it triggers different outcome for each stakeholders as summarised in Table 2.

Regardless to say, creating Smart Tourism Destinations from scratch requires leader to constructively engage with local to ensure community participation and also regularly monitor the plan. The flagship of the transformation to Smart Tourism Destinations is destination-wide access to real-time information. To achieve this, destinations must undertake open access through integrated public-controlled operating systems to offer unrestricted data to all citizens and avoid vendor monopolies (Zygiaris 2013). Tourism authorities should ensure that any information generate from every development of new application should be made openly available subject to their commercial and legal agreement without unreasonable additional cost (Reischl 2013). There are two main information sources: (1) information coming from the city resulting from sensors, city elements and

Table 1 Tourism applications in smart tourism destinations

No.	Tourism applications in smart tourism destinations	Utility function	Destination components (Buhalis 2000)	Smart tourism destinations dimensions (Cohen 2012)
1.	Augmented reality (AR) enables visitors to experience digital recreation of tourism sites and time travel (Chillon 2012)	Interpretation	Attractions	Smart people, smart mobility
2.	Vehicle tracking system provides a real-time information of transport network and could be distributed to end-user devices (Arup 2010)	Planning	Accessibility	Smart living, smart mobility
3.	Hotel should able in predicting energy demand for building and perform energy audits based on their environment management (Metric Stream 2013)	Sustainability	Amenities	Smart environment
4.	A multi-languages application that provide range of services such as electronic travel guide which also offer numbers of available packages for tourists (Jordan 2011)	Guidance	Available packages	Smart people, smart mobility
5.	NFC tags and QR codes to access information about nearby points of interest through mobile devices (GSMA 2012)	Proximity marketing	Activities	Smart mobility
6.	Tourists are able to register their complaints through a Complaints Management System that supported by various ICT channels such as SMS or mobile applications which could directly route them to appropriate officials (Metric Stream 2013)	Feedback	Ancillaries	Smart living

Table 2 Smart tourism destinations characteristics

No.	Stakeholders	Characteristics of outcome
1.	Tourism organisations	• Function as smart hub that coordinates all relevant information and makes it easily accessible for users to access real-time information • Digitisation of core business processes • Optimise their energy use • Engage with local communities, tourists and government in co-creating tourism experience • Organisational agility, speed decision making and responsive to customers' needs based on just-in-time insights • Precision targeting and personalised service
2.	Governments	• Information governance that support data openness • Regulate data privacy • Establish Public–Private Partnership
3.	Local residents/local communities	• Constantly connected • Sufficiently creative and empowered • Technology savvy • Citizen journalism • Actively involved in developing smart heritage/e-Culture
4.	Tourists	• Well-connected and well-informed • Active critics and buzz marketers • Demand highly personalised service • Engaged both socially and technologically • Dynamically discuss through social media • Co-create experience • Contribute to content • Utilise end-user devices in multiple touch-points
5.	Environment	• Interconnected through Internet of things • Presence of cloud computing services • Innovation ecosystem • Sensor networks throughout the environment • Combine digital information and social contexts which will augment geophysical reality • Interoperable social platforms

Source Adapted from (Hedlund 2012)

Open Data; and (2) information coming from the citizens and visitors as digital footprint from their social media activities. Users could use this information to identify problems as well as customised potential solutions to overcome those problems.

To maintain rapid growth of technology, it is suggested that Smart Tourism Destinations are best use Living Labs methodology as tools for learning, conducting tests and research before the implementation of new technologies and services in large-scale real-life environments. As a promising method, Living Labs not only give insights for future markets but also foster innovation and product improvements. Through Living Labs methodologies, numbers of people are selected and being involved iteratively over a co-creation process to capture the

market (Almirall et al. 2012). Although tourism often incorporates elements of spontaneity and exploration, seems that tourism industries in general are assuming that uncertainty reduction is preferable. In fact, tourists might actually seek out risk and opportunity to get lost and explore. To this end, some intelligent systems are now being developed in accordance to stress the importance of inspiring rather than precisely matching tourists' preference (Mahmood et al. 2008 as cited in Gretzel 2011).

Further, Public–Private Partnership (PPP) is essential when running a Smart Tourism Destinations initiative. The operational advantages are that PPP fosters efficiency, support creativity and induce innovation to flourish (Heeley 2011). Private companies are not only offer innovative design, but also project management skills and risk management know–how (Nisar 2013). The successful implementation of Smart Tourism Destinations could also attract Foreign Direct Investment (FDI). Since these investments tend to last a long time, getting the right infrastructure in place shapes a destination for the next decades and ensuring their sustainability. While this may sound more difficult, it is actually more cost-effective in the long run (Reischl 2013). However, attracting private capital is not always a good thing. Destinations should address the risk that private could potentially dominate the field and public sectors are merely co-opted in a marginal position (McCann 2011 as cited in Vanolo 2013).

Smart Tourism Destinations is not free from political influence as it opens certain social options and closes others (Winner 1978 as cited in Gretzel 2011). In this regard, measuring the performance of destinations by attributing a higher score to specific settings could be used as a political tool considering that charts are politician's favourite to justify their political rationales. Further, the danger of using ranking as benchmark for measuring success is to subsequently develop policies based on a single model to be applicable everywhere with limited local adaptation (McCann 2011 as cited in Vanolo 2013).

It is necessary to point out that there is only little room for the technologically illiterate and the poor within destinations. Citizens and visitors are considered responsible for their own ability to adapt on this rapid development of technology. Thus, it is recommended that destinations not only focusing on exploiting the use of new technology but also educate their citizens and visitors on how to best use this new technology through series of learning method (Komninos et al. 2013).

To some extent, smartness concept sparks the idea of social control that makes intrusion in someone's private life becomes common. Through intelligent system, Smart Tourism Destinations capture information about users and their activities that could be highly personal, including their actual physical location which could be considered as potential threat to privacy (Michael et al. 2008 as cited in Vanolo 2013). Evaluation of intelligent systems in tourism is then needed to assess not only their ability to help but also their potential to harm users (The Economist 2013). This issue has raised significant ethical concerns. Many techniques have been developed to protect individual privacy, namely noise addition, micro-aggregation, rank swapping, rounding, etc. The main purpose of these techniques is to distort data in order to avoid direct linkage between individual and their

private information. The next problem that comes up upon this approach is finding the right balance between information loss and disclosure risk (Martínez-Ballesté et al. 2013). Hiring Trusted Third Party (TTP) is also one solution to hide users' real identities. Since most of the destinations are using video surveillance systems as sensor to supply real-time information on public transportation and traffic situation, TTP could take advantage of several users being under the same location to cloak their actual locations so that the server will not be able to correlate users and their actual locations (Martínez-Ballesté et al. 2013).

4 Conclusion and Limitations

Smart Tourism Destinations cored in massive tourism resource data centre, supported by Internet of Things and Cloud Computing, focused on enhancing tourists experience through intelligent identification and monitoring. The real sense of Smart Tourism Destinations is to focus on tourists' needs by combining the ICT with casual culture and tourist innovation industry in order to promote tourism service quality, improve tourism management and enlarge industry scale to a broader extent (Huang et al. 2012). The priorities of Smart Tourism Destinations construction are to enhance tourists' travel experience; to provide more intelligent platform both to gather and distribute information within destinations; to facilitate efficient allocation of tourism resources; and to integrates tourism suppliers at both micro and macro level aiming to ensure that benefit from this sector is well distributed to local society (Rong 2012). Most of the time, tourists only have limited knowledge and low awareness on destinations they visit. They do have different needs and characteristics. Developing crowd-sourced applications by using tourists input could give valuable insight to destinations in capturing tourists' demand and tourist complaints in timely manner (Haubensak 2011).

While this paper has shed some light on the Smart Tourism Destinations literature, it also has limitation. Case studies approach might be suitable to further investigate best practice of Smart Tourism Destinations implementation and to generate more in-depth understanding within this subject. Further research is needed to expand the theoretical contributions of this research as well as to validate the findings.

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NFC Smart City: Cities of the Future—A Scenario Technique Application

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Abstract In order to be prepared for challenges caused by globalization, urbanization, climate change, socio-demographic changes, new values and norms in societies, so-called Smart City concepts have been developed. These cities implement Information and Communication Technologies (ICT) to enhance life quality, efficiency of mobility, economy and sustainability. This article intends to comprehend the symptoms which indicate the future implication of NFC technology in its role within Smart City concepts. Furthermore, the future scenarios for stakeholders in tourism destinations are illuminated by applying a scenario technique. Within this context, this study explores the role of system theory in the scenario processes in order to comprehend whether scenarios can be regarded as systems. The results of the study clarify the factors that influence the implementation of the concept. Moreover, they suggest that a secret leader in the ecosystem is crucial for the concept's success. The scenarios described contribute to the strategic orientation for future directions of tourism destinations and their stakeholders.

Keywords NFC, Smart City · Scenario technique · System theory · Complex system framework

1 Introduction

Today, approximately half of the world's population currently resides in cities, while urbanization shows constant growth (Krawczyk and Ratcliffe 2005). This fast-growing urbanization exceeded the capability of politicians, planners and

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administrators to supply society with adequate services. Cities are expressively dynamic and are structured as multi-dimensional systems. These attributes are interrelated with the effects of globalization and developments in ICT technologies (Caragliu et al. 2009; Ratcliffe et al. 2006). Adopting new technologies can support organizations to confront the challenges of the future (Dwyer and Edwards 2009). The increase of mobile technologies and wireless connection withstands time and distance limitation which leads to positive communication and relationships between tourists and stakeholders of a destination. From the stakeholders' point of view, these increases support the provision of constant experience to tourists. On the other hand, it enables tourist the exchange of information and creates new possibilities to enhance the real life experience (Racherla et al. 2008). A city that adopts ICT solutions in order to cope with certain challenges is referred to as Smart City (Hodgkinson 2011; Falconer and Mitchell 2012; Cosgrave et al. 2013; GSMA 2013). Smart Cities have the potential to become a standard living concept in the future (Hodgkinson 2011). For developing a Smart City concept, the city has to address and use numerous technologies (Haubensack 2011). For instance, some services will require NFC technology and its close range transmission ability (GSMA 2013).

The major challenges of cities and communities that are recently encountered are demographic change resulting in a population increase, polarized growth of economy, increasing greenhouse-gas emissions and a decrease of available budgets (Falconer and Mitchell 2012). Furthermore, Dwyer and Edwards (2009) identified economic, political, environmental, technological, demographic and social trends as global trends affecting the tourism industry. In regard to this, the challenges cities and the tourism industry are facing are identical. However, Smart City concepts neglect the affect and support they receive from tourism organizations. Haubensack (2011) mentions, that attracting tourism is a smart-cities success criterion besides attracting business, creating jobs and offering a rich culture. To attain unique products that offer many benefits to tourists, a destination is obliged to differentiate its tourism products (Buhalis 1999). This study focuses on Smart City concepts and investigates the roles of their stakeholders as well as the NFC technology that support the concepts. Furthermore, in order to illuminate the uncertain future, a scenario technique approach is applied.

2 Literature Review

2.1 NFC and Smart Cities

ICTs are significant for the interior organization and conduction of an enterprise. They play an important role for the strategic positioning of the organization (Werthner and Klein 1999, p. 1). Therefore, ICTs can contribute significantly to organizations and produce competitive advantages (Buhalis and Egger 2006; Dwyer and Edwards 2009) in terms of cost effectiveness or differentiation strategies.

However, only proficient and effective usage of ICTs provides competitiveness (Baggio 2004) and the potential to tremendously increase customer satisfaction (Schrier et al. 2010). In terms of technological developments, tourism has always been an initial implementation field (Öztaysi et al. 2009). In the communication trend, travelling with the mobile phone has changed from being comfortable to being obligatory. Mobile services offer many benefits to travelers. Accessibility is fast and services are easy to use, they are optimal for travelers (Egger and Buhalis 2008).

NFC has a significant positive impact on the tourism industry (Egger and Jooss 2010; Pesonen and Horster 2012). Egger (2013) states that NFC offers a range of possible functions for the tourism industry like mobile payment, information supply, access authorization, object identification, workforce management, location based services etc. Smart cities have the potential to attract investors and create significant economic benefits through developing strong infrastructure (GSMA 2013). Therefore, the aim of Smart Cities is to develop ICT based innovative services by incorporating user-centric applications and future internet technologies, and to encourage researches focusing on the development of innovative applications and services (Schaffers et al. 2011). At the moment, models for developing Smart Cities and general information on the concept are in the beginning phase (Cosgrave et al. 2013). Two versatile Smart City projects have been analyzed, in order to gain a profound knowledge of the concept and to extract the relevant NFC services for a tourism industry based Smart City. The first project was Europe's first NFC project launched in Nice. Several NFC trials have been implemented and promoted in June 2010, under the brand name Cityzi. The second NFC project under investigation was the SmartTouch which was launched in Oulu. The project revealed several innovative mobile services which were made available via NFC enabled devices and other smart objects. A comparison was made of all NFC use cases and the services relevant for the tourism industry have been identified. These four NFC services are payment, navigation, information provision and couponing. According to Coskun et al. (2012, p. 8) the first step to adopt a NFC Smart City concept is to create a corresponding ecosystem. Therefore, the authors propose an ecosystem for NFC Smart City concepts. Through a literature review and the adaption of two ecosystems developed by GMSA (2013) and the NFC-Forum (2008), the possible stakeholders (Destination Management Organizations (DMOs), Mobile Network Operators (MNOs), Trusted Service Managers (TSMs), Banks, Attractions, Restaurants and Stores, Transportation, Accommodation, Service Providers and Users) of a NFC Smart City with tourism focus were identified.

2.2 Scenario Technique and System Theory

In order to gain confidence, it is essential to look forward, to think outside the box and to identify possible uncertainties which might arise in the future (Schwartz 1991, p. 3). Future research and the scenario technique as one of its methods are

critical issues in terms of strategic planning of destinations. They contribute to the research conducted in the destination in order to develop new concepts. Therefore, the destination is prepared to address future events which might occur, thus enhancing their competitiveness (Page et al. 2010). Future thinking is also called "la prospective" (Godet 1987, p. 3). This study adopts the scenario philosophy of Michel Godet. Organizations must learn to consider multiple future alternatives rather than seeing only a single future (Popp and Schüll 2008; Fink and Schlake 2000; Chermack 2004). The actual future outcome will be the interaction of the various possibilities for the situation. La prospective is not forecasting or a futurology. It is a way of thinking to take actions, rather than believing in fatalism (Godet 1987, pp. 3–5). Implying and clarifying theories in scenario technique processes are not common (Wilkinson 2009). However, the system theory aims to create and provide a strong framework, in order to support integration of elements (Chen and Stroup 1993). Skyttner (1996) defines a system as a group of interacting components or elements which can form a compound that aims to perform certain functions. When change occurs in one factor, it directly initiates an effect on other determinants (Ashby 1956, p. 5). The interactions among the determinants are nonlinear (Baggio 2008) and certain loops are present in a system (van der Heijden 1997).

3 Methodology

3.1 Influence Analysis

Through the analysis of the various influence factors within the sphere of influence, the key factors which are later needed for the influence matrix are determined (Gausemeier et al. 1996, p. 189). Expert interviews are essential at this stage in order to reduce uncertainties (Godet 1987, p. 66; van der Heijden 1996, p. 8). Therefore, semi-structured interviews with one open-ended question were conducted with six experts, each of them representing a stakeholder of the NFC Smart City ecosystem. The experts work for *Türkcell* and *AVEA* representing the MNO's, *ABank* the banks, *Mezzaluna* the restaurants and at a 5-star Hotel in Salzburg which wishes not to be mentioned. In addition, Nikolas Psaroudakis, an ICT expert in this field, was interviewed. Four out of these six interviews were conducted via Skype, the other interviews were conducted face-to-face. The influence factors given by the experts were analyzed and those that are similar have been clustered. The key influence factors are security, user acceptance, infrastructure, partnerships, privacy, investments, stakeholders, marketing and consumer experience.

3.2 Influence Matrix

The next step is to investigate the direct influence of each factor on one another. The intensity of influence among the factors is then rated according to a scale[1] (von Reibnitz 1987, p. 38; Gausemeier et al. 1996, p. 191). The influence rates have been identified through an online focus group via Skype 6.6.0.106. The participants were Hasan H. Erdogan (University of Dokuz Eylül), Mahmut Firat (Sworn Bank Auditor) from the Banking Regulation and Supervision Agency (BRSA) in Turkey, Cem Ferdi Ordu (Commercial Marketing Manager) from ABank Turkey, and Nijat Baghirov (Intern—Marketing Department) at the Liberty International Tourism Group Salzburg.

Figure 1 shows the influence matrix with the weighting determined by the online focus group. The addition of the rows gives us the active sum for each factor. Active sum shows how strong the influence of one factor is on the whole system. On the other hand, the addition of the columns gives us the passive sum for each factor. Passive sum shows how strong one factor is influenced by all the other factors (von Reibnitz 1987, p. 38; Gausemeier et al. 1996, p. 194).

3.3 System-Grid

In this step, the results of the direct influence analysis are transmitted into a so called System-Grid. The System-Grid provides a more convenient illustration of the influence matrix (Weber 2013; von Reibnitz 1987, p. 38; Gausemeier et al. 1996, p. 194) and provides an overview of the elements according to their active/passive influence on the system. Area I is the field where the active system elements are positioned. The elements in this area are characterized by their high activity. Area II is the field for the so-called ambivalent system elements. The elements falling into this field are characterized by their relative high activity and passivity. The elements falling onto Area III are the so-called buffering or low ambivalent system elements. The elements in this area have a low influence on all other elements in the system and are weakly influenced by them. The Area IV is the field of passive system elements. They are characterized by their high passivity, which means they are influenced strongly by all other system elements but have rather a weak influence on them (von Reibnitz 1987, pp. 40–41). The influence factors privacy, consumer experience and user acceptance are all situated in area IV. These three influence factors have been excluded from further discussions. The influence factors infrastructure, partnerships and security have a very high influence on the system, as they are located in area I. Marketing is between the areas I and II, and has therefore a high influence as well. Investment and stakeholders are located on area II. These elements were considered for further discussion in the scenario method.

[1] 0 = No influence, 1 = Weak influence, 2 = Mediate influence, 3 = Strong influence.

System Element Influence (Of → On)	Security	User Acceptance	Infrastructure	Partnerships	Privacy	Investments	Stakeholders	Marketing	Consumer Experience	Active Sum
Security		3	0	0	3	3	2	0	1	12
User Acceptance	0		0	0	1	0	2	0	0	3
Infrastructure	2	1		1	3	3	3	1	3	15
Partnerships	2	3	3		2	3	1	1	1	14
Privacy	3	3	0	0		0	0	1	2	6
Investments	1	0	2	1	3		3	3	2	14
Stakeholders	0	2	0	2	1	3		2	1	11
Marketing	0	3	0	0	3	1	3		3	13
Consumer Experience	0	3	0	0	0	0	2	3		8
Passive Sum	8	15	5	4	13	10	14	11	12	

Fig. 1 Influence matrix

3.4 Complex System Framework

After eliminating the factors without a significant influence on the system and the similarity analysis, the complex system framework can now be constructed. According to the weight of their influence identified on the influence matrix, the feedback vectors are dragged. The complex system framework is shown on Fig. 2. For drawing vectors among the influence factors, only the influences with a weight of 3 have been considered. However, as the author sees some influences as important for the framework, two influences weighing 2 have been added to the framework as well. The first one is the influence of investment on infrastructure, the second the influence of infrastructure on security. Moreover, there are no factors which influence each other negatively.

3.5 Projection of Alternative Future States and Consistency Analysis

The next step in the scenario method is the future projection of the influence factors. This means to identify the alternative situations or states of the influence factors in the future. Hereby, it is important to describe the future states very transparent in order to avoid biases (von Reibnitz 1987, p. 46). After identifying the alternative future states for each influence factor, the list was entered into the option development box on Parmenides EIDOS 7.6 which can be observed on Fig. 3.

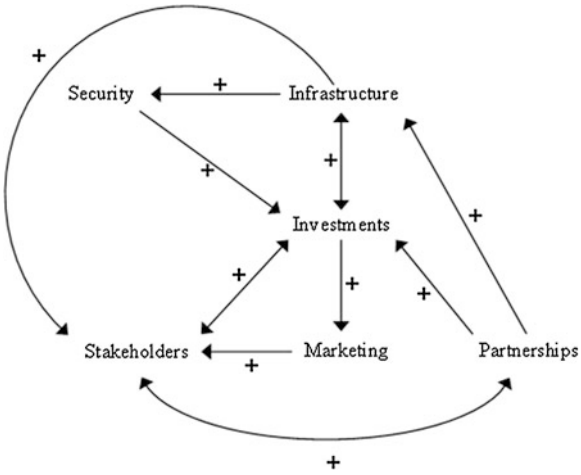

Fig. 2 Complex system framework

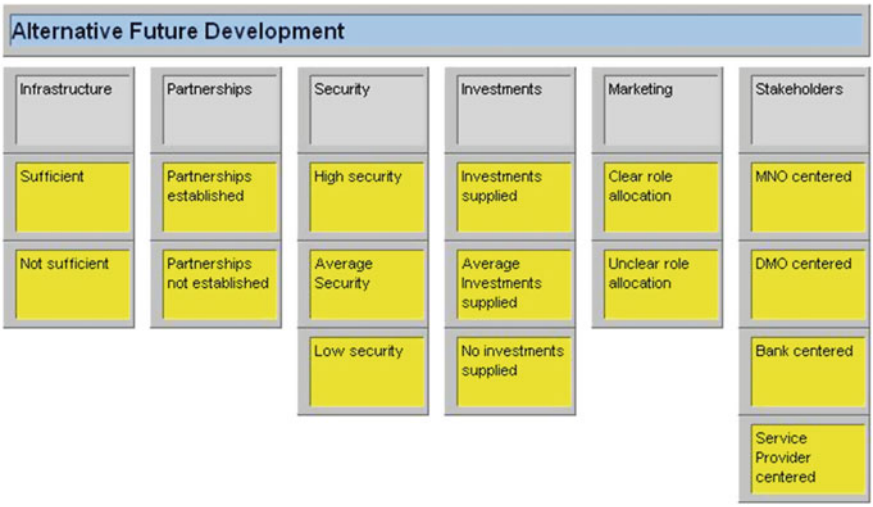

Fig. 3 Alternative future states. *Source* Snapshot—Parmenides EIDOS 7.6

The final step of the scenario method is the consistency analysis. The aim of this step is to prove the consistency between all the future alternatives. Therefore, the logic or compatibility of the alternatives (Mietzner and Reger 2005; Gausemeier et al. 1998) identified can be tested. After entering the future alternatives to the option development box, the software automatically created the consistency matrix. Thereafter, the consistency for all alternatives was weighted pairwise, on a scale from −3 to 3. The rating was performed via an online focus group by using Skype 6.6.0.106. The participants were the same as those for the

influence matrix. After the ratings were entered, the software calculated the consistency of all the compared pairs. 100 scenarios were created and listed according to their consistence. The consistency rate indicates the stability of the scenarios and shows which have a higher validity in the long term. Therefore, the high consistency rates are an indicator for the selection of scenarios (von Reibnitz 1987, p. 50).

4 Study Findings

It is important to notice that the more scenarios are drawn out, the more uncertainties occur (Godet 2000). The authors decided for three scenarios, due to the three main stakeholders in the concept. Godet (2006, p. 32) argues that in some industries such as electronics, a range of 2–4 years is already considered to be long term scenarios. However, the scenarios are investigated on a 5-year time horizon. Furthermore, the influences shown on the complex system framework are analyzed within the scenarios.

4.1 Scenario 1: The Vital Veins

In this scenario, the MNOs adopt the position of the secret leader in the ecosystem. The usage of NFC technology is considered to be accepted by the users. As NFC services are mainly based on mobile phones, the MNOs and banks have already the essential infrastructure to provide NFC services. Furthermore, MNOs deliver internet connection for locals as well as tourists. This increases the efficiency of retrieving relevant tourist and navigation information. In addition, they offer mobile couponing solutions. Banks are able to offer contactless mobile payments for local inhabitants. By providing interbank infrastructure and services, tourists are able to pay via their NFC enabled mobile phones, even with foreign bank accounts. Partnerships are established which affect the infrastructure, investments and the stakeholders according to the complex system framework. All service providers are part of the concept, by delivering NFC services. Payment services are facilitated through the partnership with banks. With the partnership of MNOs, people may touch the NFC tags with their mobile phones and are allowed to reach unlimited information content, offered through the enabled internet access. While MNOs own the secure element, security has been fully supplied for users which influence investments. Banks provide additional security for contactless payment. Investments are sufficient and lead to the concept realization. This is crucial as it influences marketing, infrastructure and stakeholders. Investments have been supplied by the state through the DMO as well. The marketing roles have been allocated and each stakeholder within the ecosystem appears to know their responsibilities concerning marketing activities. As the DMO is in the ecosystem,

the marketing role for promoting the destination is emphasized. In this scenario, the future indicates the implementation of the NFC Smart City concept without any significant problems.

4.2 Scenario 2: DMOs with Flaws

The DMO takes the lead on the concept and becomes the center of it. They accomplished all the crucial steps for realizing the concept. However, some flaws are detected during their leadership. For this scenario considers NFC to be adopted by the users. First of all, the DMO could not provide the necessary infrastructure. This seems to be the major problem which they are confronted with, as it has a direct influence on stakeholders, security and investments. Even though the partnerships are established, the infrastructure appears to be insufficient. More investments have to be supplied in order to enhance the quality and quantity of NFC services in the destination. Furthermore, the established partnerships might fluctuate due to the inexistence of adequate infrastructure. The service providers supply investments merely to provide NFC services within their means and not to support others. Another flaw which was detected appears to be the security issue. An average security is provided, but this is not sufficient for the users. When security shows to be lacking, the users might be unwilling to utilize the services. Required investments have been supplied by the DMO and other stakeholders in the ecosystem. This can also be observed on the complex system framework, as investments are influenced by partnerships and stakeholders. The DMO is capable of allocating the marketing activity roles. In fact, the major marketing role is played by the DMO. However, as enough investment has been supplied, marketing activities are performed by all stakeholders. In this scenario, the DMO seems to be capable of providing enough investments and establish the necessary partnerships. Furthermore, the marketing activities are clarified under their lead. Nevertheless, the DMO offers insufficient security. Also the infrastructure is deficient in realizing a unique NFC Smart City concept.

4.3 Scenario 3: Worst Case Scenario—Alone in the Dark

The worst case scenario is described in the aspect of the service providers. In this scenario, the service providers are left alone completely. No partnerships were established, each company following its own lead. The infrastructure is insufficient as each stakeholder is not capable of providing it separately. Security cannot be provided adequately as banks and MNOs do not cooperate with the other stakeholders. The concept is neglected by the TSMs, which diminishes the unique value of the concept. As the service providers consist of several stakeholders, an impressive amount of investment has been supplied. However, the supplied

investment of each stakeholder is merely used for themselves, instead of investing into the concept as a whole. Each stakeholder is responsible to conduct its' own marketing activities in this scenario. The stakeholders in this scenario seem to be quite isolated from each other and act on their own. Managing the NFC Smart City has become a major challenge. The problems may cause a chaos situation, as they influence many of the key factors on the complex system framework. Therefore, the system of the concept might collapse, if the service providers are not supported by the TSMs. Even tough enough investments are supplied, the lack of infrastructure for NFC services appears to render sustaining the concept an impossibility.

5 Discussions

The first scenario has the highest consistency rate and is therefore the most plausible and stable description of the future situation. Benyo (2009) sees banks as service providers, rather than TSMs. However, the scenario illustrated the importance of banks for the role of a TSM. Banks enhance security issues as they deliver a secure environment (Coskun et al. 2012, pp. 290–291). The second secret leader, and according to the consistency rate, the main leader of the ecosystem, are the MNOs. MNOs are currently the only providers of mobile services. Therefore, they have an important place in the NFC ecosystem (Coskun et al. 2012, p. 290). These arguments were verified by their significance in the ecosystem as described in the scenario. The second scenario has certain commonalities with scenario 1. However, under the DMO leadership, the concept is confronted with certain problems. DMOs can include local, regional and national governments. Therefore, they possess a certain political significance which provides them with the necessary infrastructure and financial assets (Buhalis 2000). In contradiction with this argument, the DMO was not able to deliver the necessary infrastructure. However, they were capable of providing the required investments. The DMO was neglected in the Smart City literature, and therefore no information is available concerning their role. Nevertheless, the results indicate that DMOs can provide the necessary partnerships, provide the required investments and play an important role for marketing activities. Considering the disaster in the worst case scenario, it is elucidated that service providers are not capable of implementing the concept solely on their own. Compared to scenario 1 and 2, it becomes clear that at least one major stakeholder is vital for the concept. The NFC Forum (2008) claims that service providers are a potential TSM in the ecosystem. However, the worst case scenario points out disapproval regarding this argument. Coskun et al. (2012, pp. 290–291) stress that TSMs are a necessary branch for managing a trusted environment, whereas the NFC Forum (2008) claims that TSMs act as a linkage among the stakeholders in the ecosystem. As the service providers did not provide the expected security and are not capable of establishing the requisite partnerships according to the scenario, the authors can eliminate the service providers from the role as a TSM and justify the proposed ecosystem.

Chermack (2004) claims that system theory informs the scenario process, as scenarios can be regarded as systems. The complex system framework proposed in this study was created according to the results of the influence analysis and the System-Grid. The positive vectors were added by linking each of the influence factors that have a strong effect on another. This indicates that scenarios can be regarded as systems. In addition, the framework was shown to the online focus group participants and used as a basis for writing the scenarios. Therefore, the framework had a significant contribution to the consistency matrix and the outcomes which were the fundaments of the described scenarios. In regard to this, the system theory informed the scenario process in this study.

6 Conclusion

Smart Cities are truly the vision of cities for the future. The concepts are developed in order to find solutions for global issues such as population, urbanization or CO_2 gas emissions and to enhance the sustainability of cities. Furthermore, tourism destinations can attain uniqueness and a niche through the realization of the concept. The implementation of ICTs in cities is the key success factor to encounter the global problems. Technological developments, especially emerging innovative ICTs, are inevitable. The short range communication technology NFC was identified as one of these ICT technologies which will shape our lives and movements in cities. As mentioned throughout the article, scenarios are not the exact course of events in real life. What the future might bring us is uncertain. This article investigated the NFC Smart City concept, and how plausible future scenarios for implementing such a concept in tourism destinations might look. The described scenarios have illuminated the future of NFC Smart City concepts.

Only a small amount of journal articles and proceedings papers concerning NFC technology and Smart City concepts was found. Furthermore, scenario techniques are not common in tourism research. An additional omission was detected while searching for papers investigating scenario methods built on theoretical foundations. The scenarios created were industry-oriented while isolating the consumer side of the concept. Further research can be conducted on focusing mainly on the consumer side of the ecosystem. In addition, further research is needed for scenario methods based on theories such as the learning, decision or evolutionary theory. Finally, risk evaluations can be investigated for the created scenarios and probability tests with experts can be conducted in order to predict the probability of the hypothetical alternative future states.

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The Impact of Potential Travellers' Media Cultural Experiences

Chulmo Koo, Youhee Joun, Heejeong Han and Namho Chung

Abstract Cultural exposure to a particular country through media affects people's preference of that foreign country and may ultimately be a function of behaviour of that country's cultural products, e.g., travelling that country. Media culture has been recognized as a major reason why people would like to visit a destination. However, media culture in tourism context has been rare, drawing upon media cultural exposure, we propose a research model and attempt to answer how do socio-cultural factors affect individual's how intention to visit a travel destination site? In particular, this study examines the impacts of potential travellers' media cultural exposure in three different language use groups (i.e., English, Japanese, and Chinese) and their perception of the media cultural experience on their intention to visit the actual offline travel site (i.e., South Korea). Theoretical and practical implications of the results will be discussed.

Keywords Media cultural experiences · Use and gratification theory · Smart tourism

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1 Introduction

Tourism is predicted to grow significantly over the next years with smart devices, technologies, touristic activities, and global roaming service playing a key role integrating together tourism and technologies (Koo et al. 2013). Today, tourism has moved from cultural- and heritage-oriented site tours provided by travel guides and travel-information websites towards various proactive, tailor-made "smart" travel features using IT, together with businesses, festivals, events, and pop culture experiences that reach beyond the boundaries of the travel industry. As expected, because smart tourism changes travellers' behaviours and experiences as well as the tourist industry's business model and its product and process innovation, the trend is to pursue more innovative approaches using technology solutions and identify opportunities related to newly emerging concepts of electronic tourism marketplaces and smart tourists. Tourism has been moving from cultural and heritage sites provided by papers or website information or simply accommodation and transportation online booking systems toward more proactively tailor-made customized various features together with business, festival, event, and pop culture across industry boundaries. Mobile apps connected with social network services (Wang et al. 2012) inspire people more to engage the activities in the destination. Currently, for example, Korean pop culture such like the 'Gangnam Style Video' through YouTube (hit 1.7 billion views) in 2012 can attract visitors and boost the tourism of South Korea. "Thanks to Gangnam Style, even people who don't know South Korea now know Gangnam," (New York Times 2012). Tourism organizations continue to feed up-to-date tour contents and information through Twitter and helps 'connect and discover' to capture other forms of content, including various tourism topics.

People throughout the world have Internet access, consult blogs, and read or post information using some forms of TV, literature, magazine, YouTube, tourism brochure, word of mouth, or social media. IT enhanced tourism in all over the world has become an essential tool for accessing various sources of tourist information (Law et al. 2009; Sigala et al. 2012). Despite the phenomenal growth, there is a lack of empirical data describing the concept of cultural tourism via mass media, social media, or word of mouth in the context of tourism. One of the major questions is how people are getting connected with destinations provided by media and people and are willing to visit destinations. Surprisingly, tourism enabled by destination culture through media has tremendously interested in tourism industries, tourism researchers have not examined travellers who have experienced the destination cultural experienced contents. Thus, we investigate why travellers need destination culture and seek out cultural factors that affect intention to visit a destination. Cultural experiences through mass media, social media, and word-of-mouth factors affect toward intention to visit? The contribution of our study, conceptually and empirically, extends the Use & gratification theory (U&G theory) to the tourism context.

In particular, this study examines the impacts of potential travellers' cultural influence in three different language use groups (i.e., English, Chinese, and Japanese) and their perception of the cultural exposure by media and word of mouth on their intention to visit the actual offline travel site (i.e., South Korea). Thus, we suggested two research questions. One is how do socio-cultural factors affect a potential traveller's intention to visit a travel destination site? Second, do these factors have different effects on different potential traveller groups (e.g., English, Japanese, Chinese)? The proposed research model is validated in the context of Korean travel industry by surveying three different potential traveller groups who have never visit Korea before. Theoretical and practical implications of the results will be discussed.

2 Theoretical Background

Gratification is a certain media-related behaviours or consequences in nature (Palmgreen and Rayburn 1979). U&G theory focus on the antecedents of gratifications sought and obtained, and how this link is correlated to such variables as media and content selection, levels of exposure, media dependency, and media effects. This theory is combined of (1) expectancy (or belief), which lead a particular consequence, (2) evaluation that is the degree of affect, positive or negative toward behavioural outcome (Palmgreen and Rayburn 1982). Gratification is, for example, "I watch TV news to be entertained" indicates a certain level of expectancy (being entertained), which we can call it 'be experienced', if the expectancy is a certain destination country, then influence a function of a certain behaviour (visiting the destination country) (Palmgreen and Rayburn 1982).

A gratification sought would be seeking of a valued outcome mediated by the expectancy of obtaining that outcome, while a gratification gained may be engaging in particular behaviour. As a result, gratification sought has a tendency to seek a particular gratification from TV exposure information as the most credible source, vice versus, on the other hand, an individual's experience (direct or indirect) are most likely to be affected by such television exposure (Galloway and Meek 1981).

McKercher and du Cros (2003) identified that the purposeful cultural tourist is learning about the other's culture or heritage that is a major reason for visiting a destination. The differential value of cultures is expressed through lifestyle, work, leisure, and consumer behaviour patterns. Thus, people within a culture can make a trip motivation. Govers et al. (2007) noted that the trip motivation arising from cultural needs and desires have many sources including promotion (advertising and brochures), the opinions of the others (family, friends, travel agents), media reporting (newspapers, magazines, television news) and popular culture (motion pictures, entertainment contents). Relying on mass media, social media, and words-of-mouth for receiving and getting our information will be influenced by the type and amount of exposure on media (Elliott and Rosenberg 1987). Thus, mass

media, social media, and word-of-mouth experience factors those are already media exposure information influence individuals' experience and may formulate the perceived image of a tourism destination. The impact of cultural experience may influence on visiting of the destination site.

3 Research Model and Hypotheses

Based on the integrated theoretical background of U&G theory and media exposure for destination satisfaction, we applied media to the context of destination visit intention. External links attached to the level of culture (different language use groups) as a moderating variable. The proposed research model is shown in Fig. 1.

3.1 User and Gratification Theory

The U&G theory is explained as a media effect of mass communication perspective (Ruggiero 2000). The U&G theory categorized social use of media (context-directed), instrumental uses (goal-directed), and use of media for entertainment (emotion directed) (Liang et al. 2006–2007). For example, media exposure in the mass communications affects positively and powerfully to the effects in US presidential election campaigns, especially, television is a tool as an information source of learning. U&G researchers intently examined motivations and the uses of the media to gratify social and psychological needs by exposure to mass media. Media use makes people perceive gratification, which has an impact on the individual intention. Thus mass media exposure would be associated with lifestyle and attitudes to predict intention. Media reports and interpersonal communication approaches would achieve maximum travellers' attention to exposure themselves inter-cultural communications in the continent.

Dann (1981) introduced that tourism motivational aspects are categorized as twofold: the push and pull factors. Push factors enables a person to travel, whereas pull factors encourages the potential traveller to choose a specific destination. In this way, the importance of imaging throughout mass media such as television, social media, word-of-mouth will formulate a certain image of places. Consequently, mass-mediated representation influence mass audiences to perceive those places. More recently, television and film have the major determinant role influencing travel of a destination. Although mass media's influence is becoming important, it can be argued that individuals socially interactions influence a culture more than the mass media (Jennings and Nickerson 2005). Personal blogs have become an important source for acquiring travel information. With personal blogs including social network service in recent years, many travellers can share their travel experiences with others, therefore, non-experienced and potential travellers

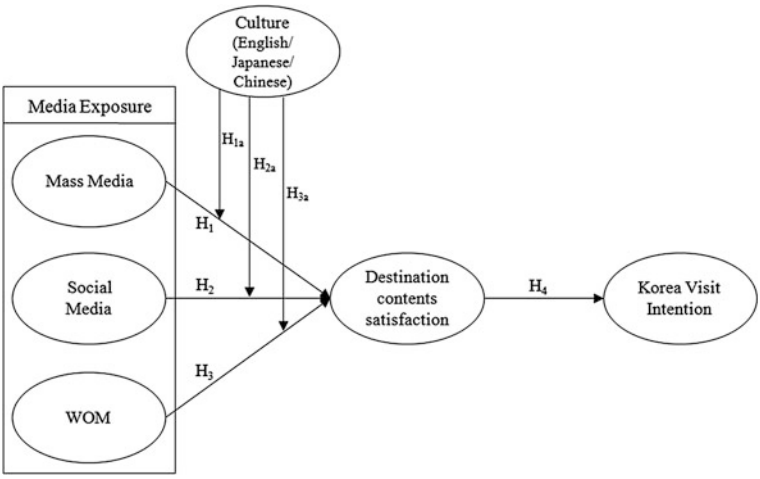

Fig. 1 Research model

toward a specific destination can be persuaded by the destination cultural contents. Social media can be a good individual channel with friends, or even strangers to share their personal travel experiences. Destination images, however, seem to be formed from not only mass media, or online social media but also social stimuli such as friends and familiar acquaintances' recommendation such like world-of-mouth (Fodness and Murry 1997). Hence, we hypothesize the following:

H1 *Cultural contents exposed in mass media have a positive impact on a cultural destination contents satisfaction.*

H2 *Cultural contents exposed in social media have a positive impact on a cultural destination contents satisfaction.*

H3 *Cultural contents* via *word-of-mouth have a positive impact on a cultural destination contents satisfaction.*

3.2 Destination Contents Satisfaction

Entertainment and emotional use of media is the most important one. If we consider the cultural contents to be a medium, we are proposing that the contents of the destination will influence a traveller's intention to visit the destination site (Liang et al. 2006–2007). Moreover, previous tourism studies have suggested that customer satisfaction positively affects behavioral intentions, such as intention to revisit, recommend the destination, destination loyalty and repurchase (Assaker and Hallak 2013; Chen and Tsai 2007; Chi and Qu 2008; Ryu et al. 2008). In particular, Chi and Qu (2008) defined satisfaction as the result of customers'

assessment of perceived quality and found that satisfaction positively influenced destination loyalty. Ryu et al. (2008) also found that customer satisfaction is significantly related to behavioral intentions in the restaurant industry. Assaker and Hallark (2013) examined how destination image affected behavioral intention such as short term and long term revisit the destination via satisfaction. The results indicated that a higher level of tourist satisfaction has a positive effect on the intention to revisit the destination in the short and long term. These findings all support the significant link between cultural destination contents satisfaction and positive future behaviors toward the destination which are included in cultural contents. Hence, we hypothesize the following:

H_4 *Cultural destination contents satisfaction has a positive impact on intention to a destination (e.g., Korea).*

3.3 Moderating Effects

Culture refers to a collective value or systems shared by its members distinctively from other social group (Hofstede 2001). Culture is a key factor in understanding and explaining consumer behavior in the decision-making processes (Kim and McKercher 2011; Tsui et al. 2007). Three different language use group (English, Japanese, and Chinese) were differed from the online travel information search behavior on the travel destination websites. Based on the above argument, the following hypotheses are proposed:

H_{1a} *Cultural contents exposed in mass media are differently affecting to the satisfaction of the contents among English, Japanese, and Chinese use group.*

H_{2a} *Cultural contents exposed in social media are differently affecting to the satisfaction of the contents among English, Japanese, and Chinese use group.*

H_{3a} *Cultural contents* via *word-of-mouth are differently affecting to the satisfaction of the contents among English, Japanese, and Chinese use group.*

4 Research Methodology

4.1 Instrument Development

In this study, all measurement items were adopted from previous research pertaining to the five constructs of mass media exposure, social media exposure, word of mouth, a destination's contents satisfaction and visit intention to South Korea. The scales and their sources are shown in Table 1. These items were then screened

Table 1 Measurement instruments

Construct		Code	Scales	Reference
Media exposure	Mass media	Mass 1	I get the sources of PSY's "Gangnam Style" through traditional media (TV, newspapers, magazines, etc.)	Adapted from Jennings and Nickerson (2005)
		Mass 2	I get the sources of "Korean Music Content" through traditional media	
		Mass 3	I get the sources of "Korean Drama Content" through traditional media	
	Social media	SM1	I get the sources of PSY's "Gangnam Style" through social media (Facebook, Twitter, YouTube, etc.)	Adapted from Liang et al. (2006–2007)
		SM2	I get the source of "Korean Music Content" through social media	
		SM3	I get the sources of "Korean Drama Content" through social media	
	Word of mouth	WOM1	I get the sources of PSY's "Gangnam Style" through word of mouth (Family, friends, acquaintances, etc.)	Fodness and Murry (1997)
		WOM2	I get the source of "Korean Music Content" through word of mouth	
		WOM3	I get the sources of "Korean Drama Content" through word of mouth	
Destination contents satisfaction		SAT 1	PSY's "Gangnam Style" is satisfactory	Adapted from Chen and Tsai (2007), Assaker and Hallak (2013)
		SAT 2	"Korean Music Content" is satisfactory	
		SAT 3	"Korean Drama Content" is satisfactory	
Korea visit intention		KVI1	I would like to visit Korea for personal leisure	Adapted from Chen and Tsai (2007), Assaker and Hallak (2013)
		KVI2	I would like to visit Korea for business purposes	
		KVI3	I would like to visit Korea on a group tour	
		KVI4	I would like to visit Korea with my family	

by experts who were asked to clarify them and then comment on whether the items were likely to be appropriate for evaluating Korea visit intention of Korea Trade Organization (KTO)'s website users.

4.2 Data Collection

The KTO's website (http://www.visitkorea.com) assisted with this study by hosting an online survey on its website. The population is users of the KTO's website, with people responding to the questionnaire about Korea visit intention. A total of 281 respondents participated between January 21 and February 3, 2013. To examine the potential moderating effect of cultural influence in three different language use groups, the respondents were divided into three groups that consisted of 145 English, 63 Japanese and 73 Chinese. A vast majority of the respondents were female; 82.8 % of English, 74.6 % of Japanese and 83.6 % of Chinese respondents. There were more single among the English (90.3 %) and Chinese (78.1 %) respondents, but slightly fewer female in the Japanese sample (42.9 %). Among the English sample, a large proportion of the respondents fell into the 20–29-year age category, while a large number of the respondents in Japanese fell into the 50–59-year age category. And almost 40 % of the Chinese respondents were in the 30–39-year age cohort. As for the annual salary, a large number of the respondents in the English sample fell into less than less than US$ 10,000 category, whereas 38.1 % of Japanese respondents belonged to the US$ 70,000 to 100,000 category. Among the Chinese, a large proportion of the respondents fell into the US$ 10,000 to 30,000 category.

A total of 89.7 % of English respondents have ever visited any of the KTO's SNS, whereas 66.7 % of Japanese and 53.4 % of Chinese have not visited yet. And among the Japanese sample (52.1 %) have ever used KTO's "VisitKorea 2.0" smartphone application, but in the English (58.6 %) and Japanese (77.8 %) respondents have not used the application.

5 Data Analysis and Results

Analysis was conducted using Partial Least Square (Smart PLS 2.0). To enable the modeling of both formative and reflective constructs in the empirical test of our research model, we adopted a PLS regression. In our research, we treated the "Destination contents satisfaction" construct as a formative scale. Smart PLS Version 2.0 was used to analyze the measurement and structural models.

Table 2 Reliability and discriminant validity

	Cronbach's α	Composite reliability	AVE	Correlation of constructs				
				KVI	Mass	SAT	SM	WOM
KVI	0.681	0.819	0.604	**0.777**				
Mass	0.730	0.849	0.655	0.051	**0.810**			
SAT	0.683	0.831	0.630	0.238	0.403	**0.796**		
SM	0.921	0.950	0.864	0.544	0.124	0.424	**0.930**	
WOM	0.839	0.904	0.761	0.384	0.430	0.389	0.560	**0.872**

Note Leading diagonal shows the squared root of average variance extracted (*AVE*) of each construct

5.1 Confirmatory Factor Analysis

The measurement model was tested with respect to individual item reliability, internal consistency, and discriminant validity. We assessed the constructs for convergent validity and discriminant validity via Confirmatory Factor Analysis (CFA) using Smart PLS 2.0. A common rule of thumb is that item loadings should exceed 0.5 and the average variance extracted for each construct should exceed 0.5. Convergent validity was established by examining composite reliability (CR), Cronbach's α, and the average variance extracted (AVE) (Fornell and Larcker 1981). As shown in Table 2, CR and Cronbach's α for all the constructs exceeded 0.6. The AVE for each construct was greater than 0.5. Thus, the results established that the items demonstrated convergent validity. The discriminant validity of the measurement model was checked by comparing the squared root of AVE for each construct with the correlations between that construct and other constructs. As shown in Table 2, the square root of AVE for each construct exceeded the correlations between that construct and the other construct. Hence, the discriminant validity of the instrument was established.

5.2 Hypothesis Testing: Main Effects

The next step of our data analysis was testing our proposed hypotheses in the structural model (Fig. 2). The structural models were examined for their explanatory power and path significance using a bootstrapping technique. The size of the bootstrapping sample that was used in the PLS analyses was 500. Figure 2 and Table 3 present the results of the hypothesis tests.

Figure 2 shows the PLS results. The research hypotheses raised in previous sections are proven. Mass media exposure has a positive impact on destination contents satisfaction ($\beta = 0.33$, t-value $= 4.96$, $p < 0.001$). H_2 is supported by the significant positive impact of social media exposure on destination contents satisfaction ($\beta = 0.37$, t-value $= 4.61$, $p < 0.001$). But, H_3 show that word of mouth does not significantly influence destination contents satisfaction ($\beta = 0.04$,

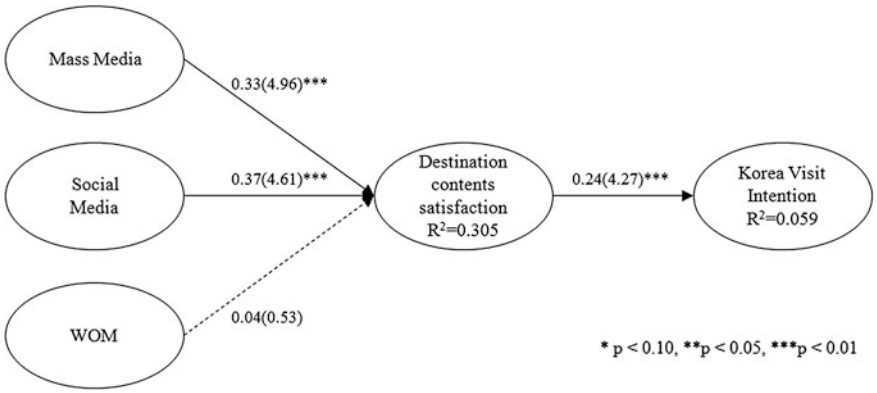

Fig. 2 Path estimates based on PLS analysis

Table 3 Standardized structural estimates and tests of the main hypotheses

Hypothesis	Path	Estimates (t-value)	Results
H_1	Mass media → destination contents satisfaction	0.33(4.96)	Supported
H_2	Social media → destination contents satisfaction	0.37(4.61)	Supported
H_3	WOM → destination contents satisfaction	0.04(0.53)	Not supported
H_4	Destination contents satisfaction → Korea visit intention	0.24(4.27)	Supported

t-value = 0.53, n.s). Destination contents satisfaction has a positive impact on Korea visit intention ($\beta = 0.24$, t-value = 4.27, $p < 0.001$). In Table 3, we present the resulting standardized parameter estimates and verdicts for hypotheses H_1 to H_4.

5.3 Hypothesis Testing: Moderating Effects

To examine the potential moderating effect of cultural difference, we conducted a multigroup analysis using PLS by comparing differences in the coefficients of the corresponding structural paths for the cultural influence in three different language use groups models (Chin 2000).

As shown in Table 4 and Fig. 3 the results indicate that the coefficients from each path for mass media and social media in media exposure were different between English, Japanese, and Chinese. Influence of mass media is indicated larger in Chinese-speaking countries than English-speaking countries, the influence of social media is indicated larger in English-speaking countries than Japanese-speaking countries. However, Hypothesis 3a was not different between English, Japanese, and Chinese.

Table 4 Comparison of path coefficients

Path		English group	Japanese group	English group	Chinese group	Japanese group	Chinese group
Mass media → destination contents satisfaction (H_{1a})	Path coefficient	0.203	0.365	0.203	0.455	0.365	0.455
	Standard error	0.080	0.127	0.080	0.126	0.127	0.126
	Sample size	145	63	145	73	63	73
	t-value	−1.105		**−1.758***		−0.504	
Social media → destination contents satisfaction (H_{2a})	Path coefficient	0.478	0.147	0.478	0.300	0.147	0.300
	Standard error	0.105	0.186	0.105	0.153	0.186	0.153
	Sample size	145	63	145	73	63	73
	t-value	**1.653***		0.973		−0.645	
WOM → destination contents satisfaction (H_{3a})	Path coefficient	0.123	0.091	0.123	0.054	0.091	0.054
	Standard error	0.103	0.223	0.103	0.134	0.223	0.134
	Sample size	145	63	145	73	63	73
	t-value	0.151		0.400		0.148	

*$p < 0.10$

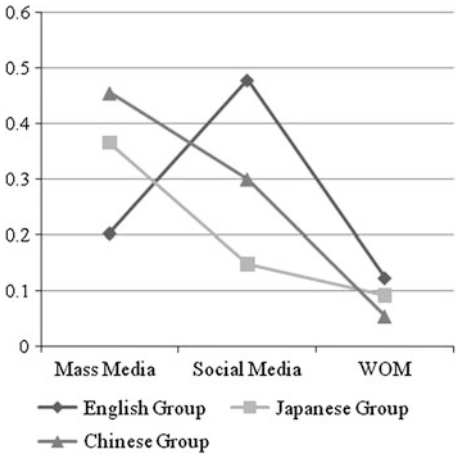

Fig. 3 Comparison of path coefficients of the media exposure on the destination contents satisfaction

6 Discussion and Conclusions

The purpose of this study was to examine the impacts of potential travellers' media cultural exposure in three different language use groups and their perception of the media cultural experience on their visit intention to South Korea. According to the analysis results in the main effect, the hypotheses of H1 to H4 except for H3 were supported verifying the theoretical arguments that were established by this study. Moreover, according to the analysis of the moderating effects of three different cultural groups, mass media is indicated larger in Chinese-speaking countries than English-speaking countries, the influence of social media is indicated larger in English-speaking countries than Japanese-speaking countries. As a result, the study's finds indicate that the destination contents exposure in mass media and social media influence the destination cultural contents satisfaction and form the intention to visit a destination (South Korea), whereas words-of-mouth through family, friends, and acquaintances did not affect to the destination cultural contents satisfaction. In summary, we assumed that modern media such as television and internet is main channels to travellers or individual users in exposing the destination cultural contents. This study has both theoretical and practical implications. Regarding the theoretical implications of this study, the prospective tourists' intention to visit destination by the impact of media cultural experiences were explained based on the U&G theory. As a practical implication of this study, Destination Marketing Organization (DMO) should focus on not only the cultural contents via television and film, even more social media contents connected with local culture but also refocus on marketing strategy formulation regarding the destination media culture. In addition, there were significant differences for accessing the destination cultures by the language group, which means, we should approach to advertise differently each countries. As is the nature of all studies, this study has limitations that should be noted. First, although most measurement items

were adopted from previously validated empirical studies and the results of the measurement model testing showed high reliability and validity, further study is warranted to validate the measurement scales in the context of smart tourism. Second, given the relatively small sample size (English, Japanese, Chinese), the findings of this study should not be generalized to other populations. Finally, in this study, we mainly considered potential travellers' satisfaction with the KTO's website and media influences as major determinants of their plans to visit Korea and ignored many other personal and business travel motivations. Thus, future research should examine other factors in addition to media influences.

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Part VIII
Website Evaluation

Website Development in Tourism and Hospitality: The Case of China

Liang Wang and Rob Law

Abstract The development of Internet technology has not only influenced tourism and hospitality operations, but also provided new research opportunities for scholars. The last decade has witnessed the continuous growth in publications of website development conducted in the context of tourism and hospitality in China. After reviewing these studies, this research found that in line with relevant research in other countries, scholars in the context of China also examined two main topics of website evaluation and Internet users' perceptions of either websites of tourism organizations or third party websites (e.g. blogs, video sharing websites). In addition, content analysis and questionnaire survey were the main data collection method. Some issues of concern were also identified as inconsistency existed between studies in an earlier stage and those conducted in more recent stage.

Keywords Website development · Tourism and hospitality · China · Review

1 Introduction

The rapid growth of the commercialized Information and Communication Technologies (ICTs) has revolutionized many industries. Since the late 1980s, such technologies have been introduced to business applications in tourism and hospitality (Buhalis and Law 2008; Ip et al. 2011) and have converted the industry

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structures and business practices ever since. In the early 1990s, many researchers and industry practitioners have noted the establishment of the Internet, which reflected from the popular trend that most firms had established some presence on the Internet (Kowtha and Choon 2001). Customers can go beyond time and geographical constraints to access product and service information (Law and Bai 2006). The traditional limitation of imbalanced competition between small companies and large firms no longer exist as the Internet can allow a small business to project an online presence equalling that of a larger firm (Watkins and Marenka 1995). In order to exploit these unprecedented business opportunities, tourism and hospitality operators have been devoting time and effort to the web-based systems, aiming to establish and maintain good relationships with customers which then lead to expansions in market-share (Law et al. 2010). Additionally, the explosion of Internet applications provides tourism and hospitality academia more significant research opportunities.

Among different ICTs activities, website development has been attracting a lot of attentions from researchers. This is not surprising considering a commercial website functions as the central platform on which transactions are completed (Angehrn 1997). As defined by Kowtha and Choon (2001), website development refers to "the technological aspect of firms' E-commerce undertaking" (p. 229). The continuous increase in number of research work is evidenced by the popularity of this research topic. Lu and Yeung (1998) initiated this research effort by proposing a framework to evaluate website performance in terms of functionality and usability. Research findings from tourism and hospitality academics could be applied to guide industry operational practices (Ip et al. 2011). Hence, reviewing relevant research articles from time to time can enable scholars as well as practitioners to be aware of research trends and knowledge advancement (Xiao and Smith 2006b). Such an attempt could be found in the field of website development in the tourism and hospitality industries. For example, Hashim et al. (2007) reviewed articles of website design frameworks published from 1990s to 2006. Their study identified six dimensions of website quality, which covers hardware aspects (information and process, design, and usability) and software parts (value-added, relationships, trust). Law et al. (2010) examined articles published from 1996 to 2009 relating to website evaluation approaches, which were categorized into five divisions: counting, automated, numerical computation, user judgment, and combined methods. Different from evaluation-instrument-based classification adopted by Law et al. (2010), Ip et al. (2011), based on the research methodology, grouped website evaluation studies in the same time. Their research identified a website evaluation model which included evaluation by phases, evaluation by features, and evaluation by features and effectiveness.

This body of work provides an updated perception of the historic evolution of website development in the literature at large. A close examination of website development at regional level, however, remains lacking. Although there has been an eBusiness rush by many firms in the tourism and hospitality industries, not all businesses pursue electronic commerce in the same vigour. Online business strategies vary even in the same industry. Such divergence could reflect a firm's

marketing strategy which is associated with resource allocation decisions (Mishina 1998). At a geographically regional level, the local economic development has a compelling impact upon website construction (Lu and Lu 2004). Thus, it is reasonable to argue that website development in districts of contrasting economic situations will follow distinctive progressing tracks and present various features. As such, coverage scope of review research relevant to website development in the tourism and hospitality industries can be the available articles searched from databases. At the same time, more research endeavours could be made to website development in a specific place that can reflect the unique features of different eMarketing strategies. However, few review articles have discussed website development at the regional level, not even in China, the world's third most popular tourism destination (gbtimes 2013). In China, the number of Internet users increased from 59.1 million in 2002 by 50.49 % per annum and reached 564 million in late 2012 (China Internet Network Information Centre, CNNIC 2012). Among them, 112 million Internet users rely on the Internet for travel information search as well as buying tourism products (CNNIC 2012). In line with this tremendous momentum, value of online travel market in China is noticeable. In 2010, China's eTourism market was worth RMB 103.74 billion (US$1 = RMB 6.8) (iResearch 2011) and it is projected to hit US$ 48 billion by 2016 (Tech in Asia 2012). Despite the huge population, it is only a small proportion of less than 20 % compared to the entire pool of Internet users, indicating high potential for business opportunity.

In recognizing the significance of the Chinese eTourism market, many scholarly efforts have been made on relevant topics like website development. While acknowledging these academic efforts, the comprehensive updates of the research status in this realm is still lacking. As such, the current research aims to fill in this research gap by reviewing previous studies relating to website development in the background of China's tourism and hospitality industries. In addition, this study is a complement to the work conducted by Zhong et al. (2012) in analysing articles published in English as they examined the Chinese language literature. The purpose of this article is to recap the current knowledge in the area of website development in China's eTourism market and to shed some light on tourism organizations' eMarketing decisions and implementations. Also, some suggestions for future research agenda in this area will be provided. In order to reach this objective, structure of this research is as follows: a discussion framework was proposed considering the features of China's tourism website development and precedent studies. This framework was then used to guide the review of academic literature. After that, this study suggested points for future research.

2 Methodology

Articles for analysis were obtained by searching two comprehensive databases for tourism and hospitality research journals, using a series of keywords. EBSCOhost (URL: http://search.ebscohost.com/) and Science Direct (URL: http://

www.sciencedirect.com). Both databases are popular among tourism and hospitality scholars in their analyses of up-to-date knowledge state of a particular concept (e.g. Buhalis and Law 2008; Hung and Law 2011). As to the keyword selection, it consisted of two steps. Firstly, keywords searched included eTourism+China, internet+tourism+China, online+tourism+China, eCommerce+tourism+China. Since the keywords used for searching were not directly cantered on website development in nature, the articles generated from the first step needed to be further screened. Hence, in the first step the keyword of website was used to narrow down the analysis scope and to make the finally included articles more targeted to the research topic. After the keywords searching, titles and abstracts were read to ensure their appropriateness for the current study. In addition, this study also traced references cited in the obtained articles trying to make this review more comprehensive. After careful screening, 37 suitable articles were retrieved for analysis. Research about website development in Hong Kong and Macau, China's two Special Administrative Regions (SARs), were also included due to their geographic and cultural proximity to China (Mak et al. 2013). It is worth noting that articles reviewed were not only from tourism and hospitality journals, but also journals in other fields, which render this piece of work more comprehensive.

To highlight the research proliferation and make obtained articles more comparable, certain criteria need to be adopted to categorize these articles. Several standards could be spotted in prior studies. For example, Law and Bai (2006), in a retrospective analysis, categorized preceding articles on evaluating website development into theoretical studies and empirical studies. In another review of website evaluation studies, Ip et al. (2011) classified relevant research into either qualitative or quantitative research categories, which were further divided into three classifications, based on evaluation method. Adopting a more micro-level perspective, Law et al. (2010) based their divisions on evaluation instrument and got five types, namely counting, user judgment, automated, numerical computation, and no actual evaluation.

The objective of this study is to have a comprehensive overview of website development studies in the domain of China's hospitality and tourism. It is well recognized that website success is context dependent (Schaupp et al. 2009) and cultural differences need to be taken into consideration as it may influence perceptions of website quality (Vladimirov 2012). As suggested by Lu et al. (2002) "The Chinese tourism industry has developed its online services and obtained some initial experience. China, as a developing country, has a different tourism E-commerce development environment, barriers, challenges and requirements that are indicative of a developing country compared to these of a developed country" (p. 192). As such, the specific feature of eTourism development state in China should be considered. A research effort by Lu and Lu (2004) found that China's tourism

website development process until then consisted of three stages[1] chronologically. The first stage started from 1996 when the first tourism website (wee.ctn.com.cn) was built in 1997. During this stage, tourism websites were simple and provided limited information. The second stage was from 1998 to 2000 during which tourism organizations and regulatory authorities at various administrative levels established their own websites. The third stage was from 2001 to 2004 in which reconstructions of tourism websites were underway to better accommodate market demands. In the review study of eTourism in China conducted by Zhong et al. (2012), they chronologically examined preceding studies by classifying the study period into three sub-periods and each sub-period covered 5 years.

This current study follows research by Lu and Lu (2004) and the reasons are as follows. First, Lu and Lu (2004) recognized the level of sophistication and complexity of a website which could reflect the marketing strategy of a tourism business. Such a framework would allow for proactive planning of limited resources as well as coordinating website design with marketing objectives. However, Zhong et al. (2012) purely divided the study period evenly. In addition, framework proposed by Lu and Lu (2004) is consistent with a dynamic framework of website development advocated by Coleman (1998) which specified a link between website development and strategic priorities. It is also because each stage as presented by Lu and Lu (2004) was about three-year long which is shorter than the five-year period in the study conducted by Zhong et al. (2012). The current study argues that a shorter analysis period interval would be more reasonable. This is because the Internet grows at an exponential rate and a shorter time period would better capture the changes ever occurred during the development process.

As such, the authors originally divided the study period into five sub-periods: (1) 1996–1997; (2) 1998–2000; (3) 2001–2004; (4) 2005–2007; (5) 2008–2010; (6) 2011–2013. Yet, the first articles identified as relevant was published in 2002. Hence, only the last four periods were included for further analysis, with 3, 12, 11, and 11 research articles falling in each stage respectively. A general increasing interest in the topic of website development in tourism and hospitality research over the years can be identified. In each time period, following the recommendations from Xiao and Smith (2006a), articles were analysed from perspectives of research themes and objectives, methodological procedures, as well as conclusions and theoretical implications.

[1] Note: The starting years were slightly different from that by Lu and Lu (2004). The original three stages were 1996–1997, 1997–2000, and 2000- now. However, the authors argued such division would cause confusion like a single year of 1997 could fall in either the first stage or the second stage. Hence, the authors slightly revised it by changing starting year of the second stage into 1998 and 2001 for the third stage.

Table 1 Themes and objectives of website development research in China

Study period	Themes/topic
2001–2004 (3)	• Distribution and classifications of tourism websites
	• Performance evaluation of hotel websites
2005–2007 (12)	• Website evaluation (content, design and user satisfaction)
2008–2010 (11)	• Destination image on the website (analysis of the narrative and visual information)
	• Relationship marketing via the website (consumer trust)
	• Information retrieval within hotel websites (English/Chinese automatic translation)
	• Website evaluation (user satisfaction, user perception)
	• Online traveler reviews
2011–2013 (11)	• E-word-of-mouth
	• Performance evaluation of destination websites
	• Websites of cyber communities
	• Online traveler reviews
	• Online news stories for tourism policy
	• Website analysis for business operational philosophy
	• Third party strategic websites

3 Findings and Discussion

Analysis results are depicted under the above mentioned chronological categories.

3.1 Themes and Objectives of Website Development Research in China

This section looks at themes and objectives of website development seen through a sample of publications. First, from the perspective of research themes, destination marketing via websites and website evaluation are the frequently studied areas (see Table 1). Such high frequency is not surprising as marketing and promotion are the most affected business areas by the technological innovations.

It is well noted that impacts from information and communication technologies upon the tourism and hospitality industries are dynamic and graduated (e.g. Buhalis 2003). Similarly, research in the background of China have identified that website development in tourism and hospitality started with the elementary functions of information exchange and reservations, and gradually more complicated roles of add-valued services. As such, in the early stage of the study period, literature of organization-centric elements (e.g. content and design) dominants. Then, research extended to involve marketplace by examining Internet users' perceptions of websites (e.g. hotels or tourism destinations). Later, a more advance research angle was introduced which highlighted initiatives of customers

themselves as well as the third party websites (e.g. online traveller reviews and building destination image on others' websites). The successive stage incorporates research topics of the previous stage and the emergence of new topics is consistent with constant innovations in hardware, software, and network. For example since 2005, Web 2.0 which supports social media platforms has been changing the way people communicate, make decisions, and socialize with each other (Constantinides and Fountain 2008). Such a phenomenon also transformed the power structure in the marketplace as consumers have access to online knowledge reservoir to create and disseminate information beyond the control of online marketers. In more recent years, tourism and hospitality scholars began to study this topic in the context of China.

As mentioned above, there is an increase in the number of publications studying website development in China's tourism and hospitality industries, mainly in the early stage of the study period. Such tremendous increase could be contributed to the unparalleled growth in its economy and the tourism businesses. And also this big jump in publication number implies research in China was lagged behind those in developed countries. Hence, in the early research phase of website development, research efforts mainly attempted to examine the adaptability of research frameworks initiated in either the contexts of developed countries or other research fields. With the results, scholars sought approaches and models for China's marketers to website construction. As suggested by Goeldner and Ritchie (2009), the exploitation of new media involves a sound knowledge of its function and nature. After gaining more knowledge of website features in terms of design and content at large, researchers devoted more endeavours to behaviours of web users. Accordingly, research objectives of studies in the latter period centred on digging out information guiding reengineering business functions of websites.

3.2 Methodological Procedures of Website Development Research in China

This analysis also looks at research methodology and actual tool for data collection in the methodological procedures of website development research in China. As to research methodology, this study divided into two types: quantitative and qualitative research. Discussion of research methodology has long been a hot topic among academia. They agree that research context and objectives are key factors influencing methodology selection. As to website development research, the use of quantitative methods has become a general practice as many scholars have adopted such methods to conduct their research (e.g. Kim et al. 2006; Zhang et al. 2010). Cakmak and Isaac (2012) concluded that qualitative methods could be supplementary to quantitative research methods as qualitative methods could disclose the holistic and psychological impressions. More specifically, O'Leary and Deegan (2005) suggested that content analysis of text information could yield considerable information about destination image building.

Table 2 Methodological procedures of website development research in China

Methodological procedures	Study period				Total (frequency)
	2001–2004 (3)	2005–2007 (12)	2008–2010 (11)	2011–2013 (11)	
Research methodology					
Qualitative methodology	1	6	8	6	21
Quantitative methodology	2	6	3	4	15
Data collection methods					
Questionnaire survey	1	6	3	4	14
Interview	–	–	–	1	1
Focus group discussion	1	–	–	–	1
Content analysis	1	6	7	5	19
Others (experiment and numerical analysis)	–	–	1	1	2

Findings in this research are consistent with previous arguments (see Table 2, all the numbers are frequency of each method). In the fourth stage of 2011–2013, one article written by Guttentag (2010) theoretically discussed applications and implication of virtual reality in tourism, but no empirical verification. From the perspective of research methodology, slightly more research used qualitative research methods in general. In terms of the actual ways or methods of data collection, all research used primary data to achieve their research objectives. Content analysis and questionnaire survey were most often used for data collection. Examining research methods from the perspective of research topics, it found that studies of exploring web users' perceptions mainly used the questionnaire to collect data while few adopted qualitative research methods like interviews or focus group discussions. The method of content analysis was mainly adopted to inspect elements of either destination or hotel websites. Further examination revealed that the targeted websites in these studies were existing ones and researchers evaluated their effectiveness and performance with a set of indicators. This would decrease the applicable value of this research as there would be a time lag before any revisions could be made. Hence, it would be more of practical significance if a model website could be developed and evaluated after which a real commercial website could be built. From this point of view, the research method of experiment would be more legitimate as a theoretically rigorous website would be firstly developed immediately after which the evaluation would be conducted to test its applicability. In the recent stage, Li and Law (2007) adopted experiment in the research examining English/Chinese information retrieval approach. This approach solves the problem of cross-lingual information retrieval (IR) as it enables the automatic translation an English phrase into Chinese characteristics in the cross-lingual hotel IR.

Table 3 Conclusions and theoretical implications of website development research in China

Study period	Theoretical implications	Main points in conclusions
2001–2004 (3)	• More efforts should be devoted to evaluation of tourism website performance	• Main unsatisfactory aspects of online tourism services in China: poor web information and a lack of interactive support like online payment functions
	• Future research should incorporate customers' opinions. Also hotel website optimization and usability of hotel websites	• A quantitative measurement scale was proved applicable in hotel industry of Hong Kong
	• Comparability research on performance of hotel websites and travel portals	• Performance of hotel websites is significantly related to hotel star rating
		• Hotel website development was more promotion-oriented while updating was downplayed
2005–2008 (12)	• Comparative analysis of website performance across rating, geographical regions	• Chinese hotel websites did provide basic information
	• Developing a marketing-mix-based website marketing model	• Inconsistence of the website front-end and transaction processing was existed
	• Larger sample size, data of customers' actual behavior, and qualitative research methods should be adopted	• Website usability of chain hotels performed better than independent hotels; better website performance of U.S. hotels than their mainland counterparts; In terms of website usability, luxury hotels in Hong Kong did not perform significantly better than mid-priced and economy ones
	• Future research can evaluate perceived trust level across different internet users	• Convention, safety, and technological inclination were key factors influencing e-satisfaction of Chinese internet users
	• Extend the research scope to include more websites for examination	• Savvy Internet users less likely to rely on reputation or price benefits among Chinese hotel customers

(continued)

Table 3 (continued)

Study period	Theoretical implications	Main points in conclusions
2008–2010 (11)	• More international research angle should be adopted by studying international review websites	• Consumer-created reviews about restaurants were perceived by Internet users as more reliable and valid
	• Comparative research should be conducted about destination images presented on Chinese-language websites and English-language online information source	• Images of Macau presented on different sub-categories of websites were different
	• Survey sample size could be increased for representation concern	• The feasibility of a novel English/Chinese information retrieval approach on hotel websites was proved
	• Conduct a longitudinal study of the DMOs websites	• Updated information on the website should be provided in an easy-to-use way
	• Comparative research of DMOs websites across nations and cultures	• The impacts of consumer generated reviews proved to be significant on hotel room sales
	• Experts like tourism administrative staff need to be invited in website evaluation	• Stories posted by travelers on websites would indicate tourists' expectation of a certain destination
		• DMO websites in China had medium problems in term of website usability features
		• Chinese Provincial Tourism Administration (PTAs) were not using their websites effectively

(continued)

Table 3 (continued)

Study period	Theoretical implications	Main points in conclusions
2011–2013 (11)	• Travelers' reviews posted on the Internet should be analyzed based on the different influences	• Impressions from Chinese backpackers of a certain destination could be identified by analyzing tourism forums and online diaries of tourists
	• Web-mining technologies would provide different perspectives of online review impacts	• Valence of travelers' reviews had a significant impact on the online sales of hotel rooms
	• Future studies could extend a model proposed by including more variables	• Six frames were identified in China's current tourism policy-making process. News and reports from portal websites
	• Comparative study can be conducted on applicability of targeted association mining and other data mining techniques in analysis of traveler behavior	• Partial proposed attitude measures and behavioral measures could be used to estimate future profitability of virtue community membership
	• More research efforts should be devoted to examine relationships between visual representations and verbal narratives when construct destination image online	• A group buying model for restaurants was developed • Factors directly influencing e-word-of-mouth were identified • For better cooperation between tourism hotels and third party websites, the first-best solution is integrating hotels and the third party websites as a single player while the second-best solution is to take equilibrium actions

3.3 Conclusions and Theoretical Implications of Website Development Research in China

The purpose of this article is to examine extant research of website development in China, aiming to shed light on tourism organizations' eMarketing strategies. To better achieve the research objective, this study looked at conclusions and theoretical implications in each selected article. Analysis finding were presented in Table 3. Main findings relating to website development and theoretical implications in terms of future research direction were checked. Generally speaking, the trend identified is in consistence of research themes and objectives listed in those studies, indicating rigor of research findings. In the earlier study periods, tourism destinations and hotels' own websites across either culture or star ratings were the research targets. The results showed that websites of China's tourism organization were lagged behind by their foreign counterparts. As such, in this period, researchers suggested that more research efforts should be devoted to adding more values to the websites. Also, customers needed to be involved for a more comprehensive overview of website development process as customers are the users who will determine the eventual success of the sites.

In the latter stage, research objects became more customer-oriented, and websites involved were beyond the scope of official websites of hotels or destinations. Rather, more third party websites (e.g. online new portals, blogs, and online communities) became the main research topics. However, these topics were not future research directions identified by the previous studies. With China being identified as a main geographical research scope, studies in this context testified the applicability of proposed models or newly developed systems. However, few attentions have been given to finding solutions to some identified problems.

4 Conclusions and Future Research

In conclusion, it is encouraging to note that scholars have showed great interests in website development in tourism and hospitality in China. Such increasing interest in this area is evidenced by the annually growing number of publications. In order to shed some light on tourism businesses' eMarketing decisions, the current review research was to examine extant studies on website development in China. Findings indicate that researchers mainly examined this topic from the perspectives of website evaluation as well as online users' perceptions of website. In addition, they adopted content analysis and questionnaire survey for data collection. In their conclusions and suggestions for future studies, inconsistency was found as few preceding studies were used to guide more recent ones.

What is needed next, other than calling in more researchers to study this topic, is the endeavours to assemble and synthesize these varied studies into a generally congenial research framework that could be applied to the tourism industry in

China at large. Additionally, the limited techniques adopted by retrieved articles in the current research necessitates more efforts in utilizing more up-to-date analysis methods like log-file analysis. Furthermore, given the large number of possible research questions, provision of guidance in the form of developing a research agenda which prioritizes useful research is imperative. This research also has some limitations which could be considered in future research. For example, Zhong et al. (2010) has conducted a review research of information and communication technologies in China by analysing theses and articles published in Chinese. Some comparative study could be conducted to check if any differences existed between Chinese researchers and their overseas counterparts in examining the topic of website development. Additionally, comparisons could be made between research findings on website development in China and that in other countries. This may grant researchers and practitioners what the current situation of website utilizations in and out of China from which gaps and strategies for further improvement could be obtained.

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Measuring the Global Readiness of Airline Websites: Are They Speaking the World's Languages?

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Abstract As global companies, airlines need to be able to cater to global audiences, particularly through online channels. The Global Readiness Index (GRI) has been developed to quantitatively measure the level of preparedness of online companies to service diverse international audiences. The concept has previously been tested on general ecommerce and hotel websites. This study modifies and extends the GRI by adopting a weighted approach for the language parameter to take into account the relative importance of alternative language versions in different markets. The resulting model is tested using a random sample of the websites of 100 airlines.

Keywords Global readiness index · Airline · Website · Glocalization · Languages

1 Introduction

In today's highly globalized world, technological advancements have made selling to customers in different geographic locations not only possible but comparatively easy (Bingi et al. 2000; Knežević 2003). Internet-enabled businesses can theoretically interact with, and sell to, customers throughout the world. However, doing so in an effective way is challenging.

To be able to take advantage of this opportunity, businesses must be prepared. When companies started transacting online at the start of the internet boom, it was assumed that 'one-size-fits-all' (Choucri et al. 2003). However, foreign consumers proved different from those in domestic markets, and a highly standardised

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approach was quickly found to simply not work. Hence the concept of glocalization was born (Andrews and Ritzer 2007; de Nuve 2007). An amalgamation of 'globalization' and 'localization', glocalization refers to the concept of catering to distinct, geographically and culturally dispersed audiences in accordance with local cultural and linguistic norms. Such a strategy originated in Japan as dochakuka (roughly meaning indigenization) in the early 1990s and has since diffused as a best practice elsewhere (Khondker 2004).

Tourism, as a sector, tries to intertwine two different challenges. The first is to cater to a global audience (as tourists by definition typically come from other countries) while the second is to preserve local distinct cultures and showcase them to the world (Nuryanti 1996). Thus, the concept of glocalization is particularly relevant (Salazar 2005). To interact effectively with their global audience, tourism companies need to put in place processes and generate content relevant to their diverse needs.

Tourism has been strongly affected by the rise of Internet as a consumer information and booking tool (Buhalis and Law 2008). Globally, travel is the number one product sold online, with consumers making use of both supplier and intermediary websites for inspiration, planning and booking (Buhalis and Law 2008). As different types of travellers use the internet in different ways, travel firms need to take such idiosyncrasies into account to be able to sell successfully. In particular they need to adapt their web presences to individual market preferences. Colton et al. (2010) found that stronger foreign market orientation (defined as acquiring knowledge and experience specific to individual markets) has a positive effect on brand strength, leading to revenue growth.

Airlines, being part of the service sector, process the typical characteristics of intangibility, inseparability, perishability, and heterogeneity (Martín-Consuegra and Esteban 2007). Most try to be global in nature to help achieve economies of scale. As a result, airline websites, more than most, need to connect as efficiently as possible with transnational audiences so as to maximise sales.

The global readiness index (GRI) was initially developed by Augustine et al. (2008) as a tool to measure whether e-business websites were equipped to cater to servicing a global audience. Based on an analysis of the literature, they defined language (options other than English); currency (options to convert currency); integrating non-US address elements into the website; payment options (having options other than credit cards); and logistics (shipping to non-US addresses) as the critical elements needed for a website to be considered global ready. This study was adapted by O'Connor (2011) to measure the global readiness of hotel chain websites by adding two hotel specific factors, namely content (adjusting the images and text of the home page to take consumer preferences into account) and bookings engine (having the customer interface and deep content in the same language as the site as a whole) and by removing the product delivery factor due to it being less relevant in the context of the intangible hotel room product. As the airline and the hotel sectors are similar, the composition of the airline GRI has been significantly influenced by the hotel GRI study.

The remainder of the paper is structured as follows. Firstly we will look at literature on the concept of global readiness. Then we develop a modified GRI giving more emphasis to one element (language) which we identify as being key to success sin a global marketplace. Subsequently, taking a random sample of 100 airline websites, we test the proposed model and argue its validity.

2 Background

Indices aid stakeholders in quantitatively measuring the environment. For instance, the Consumer Price Index (CPI) is typically used to illustrate changes in the cost of living (Boskin et al. 1998). Within Information Systems, Global Diffusion of Internet (GDI) is a six-dimensional graphical measure developed by Wolcott et al. (2001) to aid comprehension of Internet penetration in a country. Indices in general are marked by a level of analysis and serves as an aid in decision making.

The GRI was developed by Augustine and Surynt (2007) as a method of measuring the readiness of organisations to operate in a globalised market. O'Connor (2011) subsequently adapted this index and applied it to hotel industry websites, adapting parameters to accommodate the peculiarities of hotel operations.

A major limitation of these three prior studies is that different language versions of a website are given equal weights. So, a website with English and Korean versions is typically rated globally ready on a par with another website with English and Mandarin versions (other parameters being equal). Such an approach is not valid as using Mandarin enables a website to potentially reach a much larger audience than Korean. The current study helps address this limitation by assigning a weight based on the relative importance of the language versions of the website.

As a result, an enhanced version of the GRI is proposed. Many of the parameters used by O'Connor (2011) have been retained. For example, content plays an important role in capturing user's interest. An ideal website should have content targeted to the audience's cultural context. With respect to content, an important facet of the website's cultural adaptation is language. A simple change such as putting text inside an image in the same language as the rest of the home page can have a strong impact on the user's attitude towards the website. Singh et al. (2008) showed that audiences in general prefer web content that reflects their own language.

Another retained parameter is means of payment. A variety of different electronic payment systems exist across the globe (Yu et al. 2002), and different geographical regions use highly differentiated payment systems to complete transactions. Different cultures have differing levels of trust for online transactions (Cyr 2008) and implementing appropriate payment options helps develops such trust. Simply providing the major credit card Visa and MasterCard does not cater to a global audience and represents a lost opportunity.

The bookings engine is the gateway leading up to the selection of payment options. O'Connor and Frew (2002) pointed out that increasingly internet bookings are flowing through a brand's own bookings engine rather than through intermediaries, making the bookings engine an important parameter. Apostolou and Economides (2008) stress that the results from the bookings engine should be displayed in the users' primary language, which varies depending on the consumer. Airlines wishing to cater to a global audience thus need to ensure language compatibility of the bookings engine with the audience being targeted.

Having the ability to enter a non-US address demonstrates (or not) inclusiveness towards global customers (O'Connor 2011). With most airline websites moving towards electronic tickets, thus removing the delivery requirement, it could be argued that users no longer need to input an address to make a booking. However, as an address is still needed as a security feature for most payment methods, the parameter was retained in this study.

Finally, the ability to display prices in various currencies makes it easier for users to understand prices. (Perrault and Gregory 2000) point out that once a website is live, the URL becomes accessible to consumers globally, and advises including a currency conversion option because customers prefer to look at prices in their local currency. Similarly a study conducted by Chu (2001) on the needs and expectations of airline websites found currency conversion options to be an important value adding service. As a result currency conversion parameter has also been retained.

Three new parameters have been incorporated into airline GRI, namely: email support, social media links, and being part of an alliance. Email support facilitates interactivity between the website and the user, and has been shown to positively influence customer loyalty (Srinivasan et al. 2002). Lituchy and Barra (2008) note that problems are likely to be encountered by companies as they go global as clients increasingly sending emails in languages which the companies' staff cannot understand. Thus, being able to understand and respond to emails in the language of the target market in an important factor to be considered in terms of global readiness. Similarly in the post-Facebook world, social media channels also facilitate interaction, changing its mode from simplex (firm to customer) to duplex (customer to firm as well as firm to customer) (Kietzmann et al. 2011). Choi et al. (2013) found that one of the main barriers to using social media globally was language. For example a marketing message will flow through an Arabic population more reliably if written in Arabic. The same message in English would take a longer time to circulate through the same group. In such a scenario, it becomes important that social media links on a website are in the same language as the website pages as a whole.

Lastly being a part of an alliance is considered an advantage in terms of going global. Alliances create greater network access, seamless travel, transferable priority status, and enhanced frequent flyer benefits for their customers (Goh and Uncles 2003). Alliance membership may or may not drive sales, but it helps enhance the image of the airline as a global player. So, airlines intending to become global in nature should become members of an airline alliances.

Airline tickets today are for the most part delivered electronically (Andal-Ancion et al. 2003). In 2008, IATA eliminated paper tickets (Grossman 2008), driving adoption by massively reducing the cost, from $10 per paper ticket to $1 for an electronic ticket. Since IATA represents 84 % of air traffic, the issue of shipping/logistics is therefore less relevant in the context of GRI of airline websites. Thus, the shipping/logistics parameter used in certain prior studies has been eliminated.

The most significant proposed change in calculating the GRI is the use of weights to highlight the importance of having different language versions of each website. Text is still the primary way in which information is communicated on the web. Looking specifically at website age, Mushtaha and De Troyer (2009) found that, on a scale of 1–5 for the amount of text used, newer websites scored 3.3 against 2.4 for older website. However, prior GRI studies have tended to focus on website features and functionality rather than how information is being communicated. Lituchy and Barra (2008) undertook a study of airline and hotel websites to assess their global readiness, incorporating this language element. One of their key findings was that customers tend to relate and respond to websites in the respondent's primary language. Having multiple language versions of a website was seen as a key advantage for companies trying to woo international customers.

Maguire (2011) notes language as an important parameter that websites ought to work on in order to reach out to an international audience. Initially ecommerce companies started with a monolingual approach (usually English) but quickly realised the importance of being multilingual in order to reach a larger number of customers. This triggered many to shift to a multilingual website approach (Nuopponen 2002). Every new language version of a website potentially adds new customers, but not in equal numbers. While prior studies identified the importance of multi-lingual approach, each treated the issue in a simplistic way, using binary values to indicate the use of language elements other than English. Such an approach skews the values of the GRI towards websites having more language versions, irrespective of online reach. A some languages have more potential to attract new users compared to others, the treatment of the language parameter has been modified by applying weights based on the most frequently used online global languages.

From Table 1, we can calculate that a website with English and Mandarin versions will have a theoretical reach of 51 % whereas one with English and Korean versions will have a theoretical reach of 29 %. Prior studies would not make a differentiation between these two cases.

The parameters that make up the final proposed model of GRI for airline websites are tabulated in Table 2, alongside those of the original and hotel GRI for comparison purposes. The next section addresses data collection and the calculation of the index in the context of airline websites.

Table 1 Language usage on the internet (Group 2010)

Language	Internet users (%)
English	27
Chinese	24
Spanish	8
Japanese	5
Portuguese	4
German	4
Arabic	3
French	3
Russian	3
Korean	2
Rest	17

Table 2 Comparative table of original GRI, hotel GRI, and airline GRI

Parameters	Original GRI	GRI of hotel websites	GRI of airline websites
Language	Yes	Yes	Yes (modified)
Content	No	Yes	Yes
Payment option	Yes	Yes	Yes
Bookings option	No	Yes	Yes
Address elements	Yes	Yes	Yes
Logistics/shipping	Yes	Yes	No
Currency	Yes	Yes	Yes
Email support	No	No	Yes
Social media links on the website	No	No	Yes
Part of alliances	No	No	Yes

3 Research Method

According to Ip et al. (2011), there are three types of website evaluation methods, namely: by phases; by features; or by features and effectiveness. For this study, the evaluation by features method is utilized, evaluating elements of a website without taking into consideration the response of the user to said elements. As the goal is to construct a numeric scale to measure a website's ability to potentially service a global audience, this approach was judged the most appropriate.

To select the sites studied, a database of airline websites was created. A list of 1,180 airline codes was sourced from the IATA website (IATA 2013), the international trade group that assigns unique identification codes to airlines. These codes were then cross referenced with other sources to remove defunct and subsidiary airlines, resulting in a final list of 1,039 airlines. Although earlier GRI studies used a sample size of 50, Bartlett et al. (2001) suggest a sample size of 77 from a population 1,000 to facilitate generalisation of the results. Thus, a random

sample of 100 airlines was drawn from the population using a random number generator (Haahr 2012).

As the IATA website does not list websites, two different sources (AviationCodesCentral 2012; Ellis 2013) were used to identify the sites of the airlines concerned. The former is run by a non-profit organization and lists IATA codes together with the home page of the airline in question. The latter is owned by Paul Ellis, a veteran of the aerospace industry, with its data based on the prior experience of the proprietor in building such directories. Any airline absent from these two sources was dropped and a new one randomly selected from the population. Of the final 100 websites selected, two were subsequently discovered to be cargo airlines and dropped from the analysis. The final list of 98 airlines were headquartered in 68 different countries (8 in United States, 5 in France, 4 in India, 3 in Singapore, 3 in Russia, etc.), each with multiple website versions. Data for the parameters making up the airline GRI were collected using a step-by-step approach. The homepage was accessed using an anonymous browser, allowing the user to land on a web page that was geographically neutral (InternetDefenseLeague 2013). The next step involved searching for alternate language versions, specifically English, Mandarin, Spanish, German, Portuguese, Japanese, Arabic, French, Russian, and Korean. If present, each of these sites was visited and the parameters for each version noted in accordance with the criteria below.

Content The home page of each version was checked to see if the language used in images and text corresponded to the indicated language of the website. For example, a Korean version of an airline website would typically have its homepage content in Korean. Having text only in English, or half English/half Korean was considered incomplete and marked zero in the GRI analysis.

Payment Option Having only credit cards as a payment option was considered incomplete. Any language version that had alterative options was scored one in the GRI analysis.

Bookings Engine As discussed above, the bookings engine should have text in the relevant language version. Even the drop-down menu with the list of destinations should appear in the same language. Failure to insure comprehensive use of the language in question resulted in a zero mark for this element.

Address Elements The address elements section takes into consideration whether the user is able to input addresses from around the globe. Having country specific address fields deters audiences from other geographies from making a booking and was marked a zero (Table 3).

Currency A currency converter option to convert the price of the ticket into any other currency was considered a one. As the ability to pay in a different currency is typically handled by the payment gateway in the background, the ability to handle payments in different currencies was not included in the study.

Email Support Emails were sent to the website support team using the language versions in which the website was available. The content of each email was kept

Table 3 Criteria used to measure the GRI of airlines

Parameter	Criteria used to evaluate the website elements
Content	Same language as language version = 1, else = 0
Payment option	Credit card only = 0, else = 1
Bookings engine	Bookings engine in the same language = 1, else = 0
Address elements	US specific address elements only = 0, else = 1
Currency	Currency conversion available = 1, else = 0
Email support	Email reply in same language = 1, else = 0
Social media link on the website	Link to Facebook (Weibo) in same language = 1 No link or a link to a different language page = 0
Part of an alliance	Part of any alliance = 1, else = 0

simple in order to be easily translatable into different languages (for example, "Dear team, I wish to book an airline ticket. Can you tell me if there are options other than credit card payment available on your website?" The cut-off time for the email reply was set at 15 days to allow for any unforeseen events. A reply in the same language was coded as one and a different language a zero.

Social Media Link on Website The availability of a Facebook page link on the website was also examined. The language on the Facebook page was verified to see if it corresponded to the language on the website. As Facebook is not accessible in China, a Weibo link was used instead.

Part of an Alliance The airline being a part of an airline alliance was considered as a one for the GRI analysis.

For calculation of the final GRI, the parameters of each language version were totalled and divided by eight (the number of parameters). This value was then multiplied by the language version's weight (from Table 1) to arrive at the intermediate GRI for that language version of the website. These individual website scores version was then totalled to arrive at the final GRI of the airline in question. Theoretically, the highest value any website can achieve in our study is 83 % as we have only taken only the top ten global languages which adds up to 83 % of the online population. Taking into consideration more languages into the study will increase this theoretical percentage.

4 Results

For the 98 airlines studied, there were 293 language versions in total (1 airline with 10 language versions, 4 with 9 versions, 3 with 8 versions, 4 with 7 versions, 2 with 6 versions, 7 with 5 versions, 11 with 4 versions, 10 with 3 versions, 18 with 2 versions, and 38 websites with a single language version). Out of the 293 versions, 272 (93 %) had full content in the language of the website. The others had parts of their home pages (images, text, or text in images) in a different language than

intended. 73 % of websites studied accepted only the major payment cards, which means that only a quarter were able to accept alternative payment methods. 87 % had their bookings engine in the same language as the site itself, meaning that most were paying attention to the importance of language throughout the entire customer experience.

Eighty one percentage of website versions studied either accepted non-US addresses or did not require users to enter an address (49 %). This demonstrates the widespread adoption of electronic ticketing, as well as showing that airlines are aware of the global nature and diverse physical location of users. Only 26 % of websites featured a currency conversion option. This is comparatively low and suggests that airlines do not realise the importance of allowing users to see prices in different currencies. Regarding email support, out of 293 emails sent, only 96 replies were received. The average email turnaround time was 37 h and 17 min (with the quickest being 4 min and the longest being 345 h and 44 min). 74 (77 %) were in the same language as the query. 27 % of website versions had a link to a social media page in the corresponding language. Lastly 36 %, or 35 airlines, were members of an alliance, with more than half of them belonging to Star Alliance (8 airlines), SkyTeam (6 airlines), or OneWorld (5 airlines).

The mean GRI of the airlines analysed was 21 % with the highest being 59 % (jointly KLM and Lufthansa) and the lowest being HexAir at 1 % (as it has only a French version). The median GRI is 15 % with half of the values lying between 11 and 24 %. These findings were lower than expected, particularly given the comparatively high figures found in the prior GRI studies discussed earlier.

5 Conclusions

Initially suggested in 2007, the global readiness index (GRI) is a tool which can be used to measure whether e-business websites were equipped to service a global audience. Expanding and extending prior studies, this study proposes a methodology for calculating the GRI of airline websites, one that could easily be extended to other types of websites. The GRI has been refined as compared to earlier versions by the adoption of a weighted approach based on global language usage. While this goes some way towards addressing the limitations of prior studies, a variety of further challenges still exist which must be addressed by further studies in the future.

The index itself could validated by correlating it with the airlines fleet size. (Adler 2001) suggests that a global hub and spoke model for airlines ensures their survival in the deregulated market. Thus, having a bigger fleet, or having alliances with other airlines can ensure its survival. Only airlines serving multiple countries require a bigger fleet, which in turn would require them to sell to multiple audiences. This creates the need for airlines to ensure that their websites are globally ready.

In the current study, the overall GRI of airline websites was found to be 21 %. This was low compared to the prior studies. A potential reason for this might be that airlines are less globally-ready compared to hotel or ecommerce websites in general, which seems unlikely given the global nature of their business. Another explanation could be refining the GRI criteria away from giving equal weight to individual languages towards a more weighted approach has significantly changed (and hopefully improved) the accuracy and reliability of the resulting index. Future studies could investigate and develop this by comparing both types of methods, relating the resulting indexes with a carefully chosen success factor in order to validate the language weighted GRI as a construct. This study provides us with interesting indicators on where airlines could make improvements to their websites. In particular the social media parameter, which is low at 27 %, is a potential area for improvement. Similarly participation in alliances, where the parameter score was at a median level (36 %), is another area to which airlines could devote attention in order to improve their global readiness.

One of the limitations of this study is the relatively simplistic nature of the language weights. Although an improvement on previous studies, the percentage of population using a particular language tends to gradually change, and hence the GRI of individual websites will also change accordingly. This problem could be overcome by updating the weights table, but such an adjustment would make comparisons with prior studies difficult. In addition some of the other parameters may be more influential than others in influencing global readiness. Additional parameters should be added or existing ones deleted and then tested to make GRI as a construct more robust in nature. Currently we have given equal importance to each parameter but giving individual weights to each parameter (in addition to the language weights) could further improve the reliability of the GRI as a construct. Future research could also take the dimension of time into consideration. The current study only captures data at a single point of time, which does not reflect the evolving nature of ecommerce websites. Finally the success of airlines (various measures like profit, sales, human index etc.) could be correlated with their level of global readiness (measured by GRI) to demonstrate how being global leads (or not) to success.

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Digital Divide in Tourism: An Exploration of the Digital Divide Through Quantitative Analysis of the World's National Tourism Organisations Websites

Shongwe Sifiso

Abstract This paper tests hypotheses supporting a theory linking competitiveness of tourism destinations to the digital divide. National Tourism Organisations (NTOs) websites across the world were first evaluated for quality. The website quality scores were then analysed against destination digital access index categories to establish the validity of the hypotheses supporting the theory. Most inaccessible website cases were from low digital access destinations. NTO websites scores had weak positive correlations with the respective country indices (0.21–0.25). High digital access destinations had significantly higher NTO website mean scores than the other destination categories. The mean differences were not significant for site attractiveness, trip planner assistance, and ease of contact factors. To attract high digital access tourists, organisations in low digital access destinations must improve their web accessibility, ease of navigation, and marketing factors. High digital access tourists most likely originate from countries with high digital connectivity, concentrated in the Europe region.

Keywords Digital · Access · Websites · Tourism · Organisations · Destinations

1 Introduction

This paper is based on a research that evaluated websites of National Tourism Organisation (NTO) across the world for quality. The website quality scores were then analysed against destination digital access categories to establish any relationship between destinations' website quality and respective countries' levels of development. The paper is motivated by keen interest in the validity of a theory

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from previous literature linking the competitiveness of tourism destinations to the digital divide. It postulates that tourists with high digital access will most likely book holiday and business trips directly with establishments in high digital access destinations. The total cost of travel to and within low digital access destinations is higher than to and within high digital access destinations for the high digital access tourists (Mingetti and Buhalis 2010). The hypotheses supporting this theory and defining the characteristics of different digital access categorisations of destinations and tourists had so far not been tested. This paper tests the validity of just the destination hypotheses. Does the digital divide affect the competitiveness of tourism destinations?

Destination organisations and their management can identify potential opportunities and threats related to information and communications technologies thus adding value towards their required SWOT analyses efforts. Management can also be better informed how best to optimize their organisations' internal ICT resources (Websites) in their quest to secure desired new tourism markets and to meet organizational objectives. This paper is deliberately written and interpreted in generalized country categories to avoid being destination specific. It is best read in conjunction with published country digital access indices for relating to individual destinations.

2 Theory

2.1 The Digital Divide in Tourism

The theory on the digital divide in tourism is that high digital access tourists will most likely book holiday and business trips directly with establishments in high digital access destinations. Excluding intermediaries in the direct bookings reduces the total costs of travel and is more convenient. The likelihood of direct online bookings reduces with the reducing digital access level of the destination and the tourist. The total cost of travel increases with decreasing digital access levels. The lower the destination digital access level, the higher the total cost of travel due to the need to deal through intermediaries in facilitating the bookings. This reduces the competitiveness of destinations with low digital access (Mingetti and Buhalis 2010). High digital access tourists will prefer the convenient high digital access destinations. Hypotheses supporting the above theory and defining characteristics of digital access destinations and tourists according to their different digital access levels have so far remained untested. This paper tests the destination related hypothesis. It analyses the competitiveness of the different digital access levels of destination through the destinations NTO websites. The tourist hypotheses are outside the scope of this paper.

2.2 National Tourism Organisations/Destination Management Organisations

To achieve their primary objectives, organizations must acquire appropriate resources, add value to these resources through operations and then deliver the output to customers (Lynch 2009). An organizational strategy is constituted in part by the results a SWOT analysis, a necessary assessment of the external environment (opportunities and threats) in which the organisation operates and competes, and also of the internal factors (strengths and weaknesses). From this paper, tourism business organisations across the world can identify Information and Communications Technologies (ICT) opportunities and threats in their external environment as a pre-requisite for their SWOT analyses. Internal strengths and weaknesses of their website resources can be also identified and optimised in the quest for securing new business.

There is range of organisations used to market tourism destinations. Destination websites include those of Regional Tourism Authority/Organisation; Attraction; Destination Management/Marketing Organisations/systems (DMO/DMS) National Tourism Organisations (NTOs); Rural destinations; Visitor Information Centre; City Tourism; and official tourism websites. Different NTO roles include acting "as a host on behalf of the destination and visitor resources for which a wide range of interests making up the travel trade are possible; approving tourism plans and marketing strategy; and providing the co-operative base for marketing the destination" (Mill and Morrison 1985). This paper is on NTOs.

National tourism promotion initiatives and administrations receive different sentiments from respective national governments. Some countries, like Mexico and Canada, elevated the status of NTOs to cabinet levels by forming the ministry of Tourism. The United States government, however, cut funding for its NTO in 1996 and thus has no federally funded NTO (Shoemaker et al. 2007). Web advertising is one cost effective solution for destinations that must work with limited resources to achieve sustainable development through tourism.

2.3 Website Evaluation Tools and Techniques

Previous studies used the modified Balanced Scorecard to evaluate various countries' NTO websites. These were, however, restricted to geographical regions. It was used to evaluate NTO websites in European Union focusing on culture (Ismail et al. 2002); NTOs of the Caribbean, focusing on assessing website retention by NTOs (Douglas and Mills 2004); and performances of East Asian NTOs, focusing on internet marketing of tourism in Asia (So and Morrison 2004). A fuzzy multiple criteria decision-making model for evaluating websites covered various website evaluation techniques combining numerical, quantitative, and qualitative (Law 2007). Law, Qi, and Buhalis introduced factors for inclusion in a

website: Ease of use; Joy of use; content; Interactivity; Transaction report; Added value; Appearance; and clear navigation path (Law et al. 2009). This paper is not restricted by geography.

To avoid reinventing the wheel, with the help of university tourism doctoral students, a website evaluation form was constructed for this research. Mostly statements from the tried and tested Modified Balanced Score Card evaluation tool and from the other mentioned research papers were used as detailed later in Sect. 3.1.

2.4 The Digital Divide

The digital divide refers to differences in access to, and use of, Information Communication Technologies (ICTs) between different parts of society for different purposes. The differences can be between countries, organisations, and individuals. Four possible interpretations of the Digital Divide are: the gap in access to use ICTs; the gap in ability to use ICTs; the gap in actual use of ICTs; the gap in the impact of use (Fink and Kenney 2003). This paper is on the accessibility and usability of ICTs. The International Telecommunications Union (ITU) divided the world's countries into four categories according to each country's ranking by its digital access Index: High digital access; Upper digital access; medium digital access; and low digital access (http://www.itu.int/newsroom/press_releases/2003/30.html). The United Nations Conference on Trade and Development (UNCTD) in its Digital Divide report ranked countries using three indices: Digital Access Index; Digital Connectivity Index; and Digital Diffusion Index (http://unctad.org/en/Docs/iteipc20065_en.pdf).

2.5 The Digital Divide and Tourism Destinations Hypotheses

In Digital Divide in Tourism (Mingetti and Buhalis 2010) the ITU Digital Access Index categories were used to group tourism destinations into: High digital access; upper digital access; medium digital access, and low digital access. The following destination characteristics were extracted for testing in this paper as the hypothesis:

Hypothesis 1 High digital access destinations are located in well-developed regions.

Hypothesis 2 High digital access destinations are at the forefront of web applications development.

Hypothesis 3 High digital access destinations are at the forefront of web application in terms of design, content and production skills.

Hypothesis 4 Upper digital access destinations have good access to the web.

Hypothesis 5 Upper digital access destinations have less ICT usage than high digital access destinations.

Hypothesis 6 Low digital access destination's websites not used directly to market destinations.

3 Methods

3.1 Website Evaluation Tool Reconstruction

An NTO website evaluation form was constructed by improving upon Mills and Morrison's Modified Balanced Scorecard previously used to evaluate NTO websites in Asia (So and Morrison 2004) and other geographical regions. The technical aspect was omitted due to the discontinuation of the required software. The 5 point Likert scale was changed to dichotomous scale with only "1" and "0". Vague statements were omitted. Statements and factors were added from the already mentioned NTO web evaluation literature. Together with the core group consisting of tourism doctoral students from one university, the form was finalized with 46 statements divided under four factors: User friendliness (combining ease of navigation and ease of contact); site attractiveness; trip planner assistance; and marketing information.

3.2 Primary Data Collection

Primary data source was NTO websites collected from the UN-WTO website in the member states section. Each member country's information was extracted from all the regional/geographical groupings on the WTO website and compiled alphabetically by country in a spread sheet. Website scores were collected by scoring each website according to preset criteria on the evaluation form. Each website was scored based on the absence (0) or presence (1) of each item on the evaluation form. The university's research center IT lounge facilities were used for accessing the websites.

Data validation. Two university colleagues randomly selected 10 % of the websites from the list to individually evaluate independently. One was a recent doctoral graduate and the other, a postgraduate student. Each website/case had been allocated a number sequentially according to the respective country's alphabetic standing. Each evaluator was allocated websites corresponding to the numbers each had randomly selected.

Research limitations. The research was limited to websites written in the English language. Websites attributes evaluations were limited to what was requested on the evaluation form. It was mainly quantitative evaluation of the websites.

3.3 Secondary Data

Secondary data sources were: the International Telecommunications Union's (ITU) Digital Access Index (http://www.itu.int/newsroom/press_releases/2003/30.html); the United Nations Development Program's (UNDP) Human Development Index (http://hdr.undp.org/en/media/HDR2013_EN_Summary.pdf); and the United Nations Conference on Trade and Development's (UNCTD) digital divide indices (http://unctad.org/en/Docs/iteipc20065_en.pdf): Digital Access Index (DAI); Digital Connectivity Index (DCI); and Digital Diffusion Index (DDI).

3.4 Data Cleaning and Coding

Data cleaning rectified many recording, arithmetic, and capturing errors of the raw data. In coding the data, countries were listed alphabetically and allocated sequential numerical codes according to their alphabetic standing in the list. This ensured the same country was correctly referred to in the analysis despite what it may be named as in the different United Nations reports. The first country Afghanistan was coded 1 up to Zimbabwe 205, the last country. The United Nations country categories were given codes from 1 being the highest level to 4 being the lowest level of development.

3.5 Analysis

Case Summary. A summary of NTO website cases is presented according to their Digital Access categories, including cases that could not be evaluated for various reasons.

Data Description. The statistical description of the primary data is presented. In R (http://www.r-project.org), the *psych* package has the *describe* function for this (Kabacoff 2011).

Normality Tests and outlier identification. The primary data was tested for normality as a prerequisite for hypothesis testing. Normality tests in the *nortest* package of R were conducted. Outliers were identified using the Mean-variance rule and the MAD-Median rule (Wilcox 2012). The outliers were removed and Normality tests repeated. The hypotheses were then tested.

Hypotheses Testing. The United Nations International Telecommunications Union (ITU) country categories (High Digital Access, Upper Digital Access, Medium Digital Access and Low Digital Access) were primarily used as the group variable in the various analyses. This paper deliberately reports on the broad country categories to avoid being destination specific. It is strongly advisable to read the rest of this paper in conjunction with the respective indices referenced in

Sect. 3.3 to better relate to individual destinations and enhance comprehension of the interpretations of results.

Hypothesis 1 *High digital access destinations are generally located in well-developed regions*. A Chi squared test was conducted on the ITU DAI Categorical and the UNDP HDI Categorical variables to test the above hypothesis. The UNDP HDI is used as an objective categorization of countries according to their level of development, not necessarily related to ICT's and the Digital divide.

Hypothesis 2 *High digital access destinations are at the forefront of web applications development.* The Welch test (one way ANOVA) was conducted using the website total scores as the dependent variable, and the ITU Digital Access categories as the group variables. The Welch test's robustness does not require prior homoscedasticity tests. The *WRS* package in R has the *t1way* function (Wilcox 2012).

Hypothesis 3 *High digital access destinations are at the forefront of web application in terms of design, content and production skills.* Web design was assumed to mean website attractiveness. The Welch test (One way ANOVA) was conducted with only the website attractiveness factor total used as the dependent variable. The ITU Digital Access categories were the group categories.

Hypothesis 4 *Upper-digital-access destinations have good access to the web*. Using the numbers of NTOs whose websites could not be accessed for evaluation, the Chi Squared test was conducted to see which country categories those websites belong to, while at the same time testing the above hypothesis. The assumption was that if a websites was not available or accessible, it had accessibility problems.

Hypothesis 5 *Upper digital access destinations have less ICT usage than High Digital Access Destinations.* The measure of ICT usage was outside the scope of the primary data collection/website evaluation. However, the UNCTD Digital Access report (http://unctad.org/en/Docs/iteipc20065_en.pdf) contains the Digital Connectivity Index. Assuming digital connectivity to better relate to ICT usage than the other indices, its country indices were isolated and used to test the hypothesis on ICT usage between the respective digital access destination categories using the Welch test. The ITU Digital Access categories were the group variable.

Hypothesis 6 *Low digital access destinations' websites not used directly to market destinations.* Only the Marketing information factor totals were used as the dependent variable to conduct the Welch test (One way ANOVA). The Digital Access categories were the group categories.

The Research question: Are websites from the well-developed countries better developed that those from the developing countries? Only the high digital access and low digital access categories are isolated from the group variable for analysis to answer the research question. The Welch test (*T* Test) was conducted using the website total and relevant factor scores as dependent variable in each case.

3.6 Correlation Tests and Regression Analysis (Relweights)

Among the various published country indices, which would best correlate with the website quality values, and which would be best predictor of the dependent variable (website scores)? Correlation tests and regression analysis were conducted for this. The *corr.test function* found in the *pysch* package of R was used for the correlation tests (Kabakoff 2011) between the website scores and the various country indices. The *relweights* function in R was used to establish which among the indices would be best predictor of the website quality. Total website scores were the outcome variable and various country indices were predictor the variables (Kabakoff 2011).

4 Results

4.1 Case Summary

A total of 255 website cases were gathered from the UNWTO website as tabulated in the case summary above. Only 135 cases could be evaluated, 12 of which were from high digital access destinations, 35 from upper digital, 54 for medium access, and 30 from low digital access destinations. 120 could not be evaluated for various reasons, 12 of which were from high digital access destinations, 17 form upper digital access, 33 from medium access, and 52 from low digital access category (Table 1).

4.2 Primary Data Description (Evaluated Cases)

In R, the *psych* package has the *describe* function. It was used and gave these results: Mean = 27.73, Minimum = 7, Maximum = 41, Range = 34, Variance = 53.18, Median = 29, Inter Quartile Range = 9.83, Lower Quartile = 24, Upper Quartile = 33.83, Standard deviation = 7.29, Standard Error of the mean = 0.63, Median Absolute Deviation (MAD) = 5, MADN = 7.41, Skew = −0.85, Kurtosis = 0.59.

4.3 Normality Tests and Outlier Identification

Test results showed violation of the normality assumption in all the normality tests from the *nortest* package in R. Both the Mean-variance and MAD-Median outlier detection methods identified seven outliers distributed among the destination

Table 1 Case summary

	Total	High digital access	Upper digital access	Medium digital access	Low digital access	N/A
All NTO cases	255	24	52	87	82	10
Evaluated	135	12	35	54	30	4
Not evaluated	120	12	17	33	52	6
Case not evaluated						
Total cases	120	24	17	33	52	6
Not in English	53	8	10	19	14	2
Not accessible	43	2	1	11	25	4
Other reasons	24	2	6	3	13	0

Digital Access categories thus: High Digital Access = 0; Upper Digital Access = 1; Medium Digital Access = 5; Low Digital Access = 1.

The Normality tests after removal outliers gave the following results: *Anderson–Darling* ($A = 0.6577$, $p = 0.08411$); *Cramer-von Mises* ($W = 0.0916$, $p = 0.1453$); *Lilliefors* ($D = 0.0792$, $p = 0.04718$); *Shapiro-Francia* ($W = 0.9845$, $p = 0.1342$); *Shapiro–Wilk* ($W = 0.9811$, $p = 0.07143$). All the Normality tests indicate the data to be normally distributed, showing p-values equal to or greater than 0.05.

4.4 Hypothesis Testing

Hypothesis 1 *High digital access destinations are generally located in well-developed regions*. The Chi Square test results show a significant relationship between the Digital Access Index categories and the Human Development Index categories, X^2 $(1, N = 178) = 261.17$, $p < 0.05$, Cramer's $V = 0.701$. The p-value being less than 0.05 indicates a strong relationship between ITU Digital Access categories and UNDP Human Development Categories. Details are in Table 2.

205 countries used in this research. The ITU Digital Access Index had 178, while the UNDP Human development Index had had 187. Cross tabulation results show that out of a total of 25 countries in the ITU's High Digital Access category 24 were from the UNDP's very high human development category. By UNWTO geographical location, 16 of the above 25 were in the Europe region. High digital access destinations are thus generally located in well-developed regions.

Hypothesis 2 *High digital access destinations are at the forefront of web applications development*. The Welch test results were: F Statistic = 4.962107; p-value = 0.004828367. The p-value is less than 0.05. Each group mean was significantly higher or lower than the next group. High digital access destinations are

Table 2 Digital access destinations by human development index classification

	Total	High digital access	Upper digital access	Medium digital access	Low digital access	N/A
All countries	205	25	40	59	55	27
ITU DAI	178	25	40	59	55	0
UNDP HDI	187	24	39	59	55	10
UNDP HDI categories						
Very high	47	24	21	0	0	2
High	47	0	18	26	1	2
Medium	47	0	0	33	11	3
Low	46	0	0	0	43	3
None	0	1	1	0	0	0

at the fore front of web development as the mean website score of NTOs belonging to countries in that group were significantly higher than those belonging to the rest of the categories.

Hypothesis 3 *High digital access destinations are at the forefront of web application in terms of design, content and production skills*. The Welch test (ANOVA) results for only the site attractiveness factor were: F Statistic = 2.056409; *p*-value = 0.1188848. The *p*-value is greater than 0.05. The group means are not significantly different. The mean of the NTO websites belonging to High digital access destinations is not significantly higher than the means of NTO websites belonging to the other digital access destination groups. High digital access destinations may be at the fore front of web application development in terms of design, content, and production skills, but the difference in means is not significant.

Hypothesis 4 *Upper-digital-access destinations have good access to the web*. From the case summary above out of the total of 43 NTO inaccessible website cases, only one was from the upper digital access destinations; 11 were from the Medium Digital Access (26 %), and 25 were from the low digital access destinations (58 %). Chi squared test results showed that NTO Websites of high digital access and upper digital access destinations showed the least accessibility problems compared to the other categories. The *p*-value is less than 0.05. Upper digital access destinations have significantly superior web access to the Medium Digital and Low Digital destinations.

Hypothesis 5 *Upper digital access destinations have less ICT usage than high digital access destinations*. The Welch test (T-Test) for the UNCTD Digital Connectivity country Index comparing upper digital access and high digital access destination categories has these results: F = 67.898, *p*-value = 0.0000000039374. With *p*-value less than 0.05, the difference is significant. Upper digital access destinations have significantly less connectivity than high digital access destinations.

Hypothesis 6 *Low digital access destinations' websites not used directly to market destinations*. The Welch test (One way ANOVA) results for only the marketing information factor were: F Statistic = 3.929009; p-value = 0.01506642. The p-value is less than 0.05. Low digital access destinations are at the trailing end of web marketing as the mean website score of NTOs belonging to countries in that group were significantly lower than those belonging to the next category, medium digital access.

The research Questions: Does the digital divide affect the competitiveness of tourism destinations through their website quality? Do High digital access destinations have better quality websites than low digital destinations? The Welch test (T-Test) results were: Total (F = 13.07, $p = 0.0012$), ease of navigation (F = 9.04, $p = 0.0047$), ease of contact (F = 4.06; $p = 0.056$), site attractiveness (F = 2.32, $p = 0.137$) marketing information (F = 11.24, $p = 0.003$), trip planner assistance (F = 1.62; $p = 0.221$).

For overall website quality (website total scores) the p-value is less than 0.05. The mean scores of NTO websites belonging to high digital access destinations is significantly higher than the mean scores of NTO websites belonging to the low digital access destinations. For the navigation and marketing factors, the p-values were also less than 0.05. The mean scores of these factors for NTO websites belonging to high digital access destinations were significantly higher than the mean scores of the same factors for NTO websites belonging to low digital access destinations. However, for the ease of contact, site attractiveness, and trip planning factors, the p-values were greater than 0.05. The mean scores of these factors for websites belonging to high digital access were not significantly higher than the scores of the same factors for websites belonging to low digital access destinations.

4.5 Correlation and Regression Analysis

All the variables had positive correlations significantly different from zero. The probability values were all less than 0.05. As shown in Table 3, NTO website scores had only weak positive correlations with the respective country/destination indices (0.21–0.25), while country indices showed only strong positive correlations among themselves (0.64–0.98).

Relative importance of predictor variable with the total amount of variance accounted for by the model (R-squared = 0.094) when divided among the predictor variables shows the following results: The UNCTD's Digital Diffusion Index accounts for 23.38 % of the R-Squared while the ITU Digital Access Index and the UNCTD's Digital Access indices trail at 17.08 and 15.52 % respectively. The UNCTD's Digital Diffusion Index would thus be a better predictor of website quality.

Table 3 Correlation test between NTO website scores and country indices

	Website scores	UNDP HDI	ITU DAI	UNCTD DAI	UNCTD DCI	UNCTD DDI
Website scores	1.00	0.25	0.22	0.21	0.25	0.25
2012 HDI	0.25	1.00	0.69		0.77	0.83
ITU DAI	0.22	0.69	1.00	0.68	0.64	0.67
UNCTD DAI	0.21	0.85	0.68	1.00	0.87	0.94
UNCTD DCI	0.25	0.77	0.64	0.87	1.00	0.98
UNCTD DDI	0.25	0.83	0.67	0.94	0.98	1.00

5 Conclusion and Recommendations

5.1 Conclusion

The competitiveness of tourism destinations can be determined by the respective country's standing in relation to the digital divide. 58 % of the 43 inaccessible NTO website cases were in low digital access destinations. High digital access destinations are found in well-developed regions. Of the 25 high digital access destinations, 96 % were found in the UNDP's very high human development category, and 58 % were located in the UNWTO's Europe region. They are at the forefront in web application development overall, but not significantly so in web design or website attractiveness.

Upper digital access destinations have good access to the web. Of the 52 NTO website cases, 98 % were accessible. They have less ICT usage than high digital access destinations because they have significantly less digital connectivity than high digital access ones, thus less usage.

Comparing all digital access destination categories, low digital access destinations had significantly low mean NTO website scores overall and for the marketing factor. The websites for these destinations are perhaps less used for directly marketing the destinations then. For trip planner assistance and ease of contact factors, the differences in mean scores were not significant. Comparing only the high digital access and the low digital access destination categories, low digital access destinations had significantly low means overall and for the ease of navigation and marketing factors. The difference in mean scores was not significant for the ease of contact, site attractiveness, and trip planning factors.

NTO website scores were weakly correlated with their respective country indices (0.21–0.25). The country indices however had strong correlations among themselves (0.64–0.98). Among the country indices, the UNCTD Digital diffusion index would be a better predictor of NTO website quality.

The quantified evidence of a positive relationship between a destination's level of digital/economic advancement and the quality of websites, though weakly correlated, suggest destinations competitiveness can be compromised by their

standing on the digital divide. State of the art websites, with all the required e-commerce functionalities to support the accessibility and usability requirements of high digital access tourists, would generally be found in NTO websites located in high digital access destinations.

Most NTOs with quantified web accessibility problems were located in low digital access destinations. Travel bookings to these destinations would mostly still require intermediaries, resulting in comparatively higher total travel costs than to the other destination categories. In competing for the high digital access tourist market, ICTs therefore are an opportunity for high digital access destinations. The competitiveness in price and booking convenience among low digital access destinations for the same market is compromised by accessibility challenges related to the digital divide.

5.2 Recommendations

For competitiveness destination organisations must continuously scout for the best value service providers, including ICT services, and pass the benefits to their customers. Some NTOs in high digital access destinations even hosted websites in other countries. For language competitiveness, one NTO hosted its English website in an English speaking country. To solve web accessibility, affected destinations can revisit their service quality requirements with their current ICT service providers. If requirements cannot be met, NTOs may consider hosting their websites where there are robust web accessibility levels. One NTO of a low digital access destination had its website hosted in high digital access country. Principals and stakeholders of destination organisations should welcome such effective value adding initiatives.

Most websites in low digital access destinations were inadequate in the ease of navigation and marketing factors. The affected and keen destinations can benchmark against good destination websites mostly in high digital access countries. Destinations organisations keen to benchmark will find 16 of the high digital access destinations located in the UNWTO Europe region; 7 in Asia and the Pacific; and 2 in the Americas. ICT service providers in the high digital access countries can also take the initiative and rescue the destinations in need of the enlightenment.

While the quantification of the different digital access markets were beyond the scope of this paper, a theory that the high digital access tourists originate from countries with very high human development and high digital connectivity can be safely proposed. With the high positive correlation between the 2012 UNDP Human Development Index and the UNCTD Digital connectivity Index (0.77), countries with high digital connectivity would also have very high human development indices. Destination organisations keen for the high digital access tourist markets would identify countries with very high human development indices from the Human Development Index (http://hdr.undp.org/en/media/

HDR2013_EN_Summary.pdf), and also with high Digital Connectivity Indices from the Digital Divide Report (http://unctad.org/en/Docs/iteipc20065_en.pdf). Countries with very high human development were mostly (27) located in the that UNWTO Europe region, while 3 were in Asia and the Pacific, 1 in the Americas, 1 in Africa, and 1 in the Middle East.

Destination organisations keen to secure and retain the high digital access tourists need to focus in those regions. The first must appreciate the expectations of this market segment, then analyse their capabilities to deliver to the travel expectations of this market. Eliminating the common disconnects between marketing goals and operational processes to support those goals would be highly recommended to sustain competitiveness. In the spirit of responsible tourism, the low digital access destinations deciding to host their NTO websites in high digital access countries to improve their web accessibility should resist the urge to market themselves as well developed destinations. The rest of the supporting infrastructure may still be inadequate to fully support the travel convenience expectations of the high digital tourists. If this is appropriately communicated, the new market would be supportive.

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An Analysis of the Key Factors Affecting the Success of a Re-Launched Destination Marketing Website in the UK

Philip Alford, Yanqing Duan and Jacqui Taylor

Abstract This paper presents a case study of the re-launch of a DMO website in the UK. It evaluates the perceived usability of the new website and identifies the key factors affecting customers' intention to use the new website. A large-scale online survey was developed to understand a number of issues relating to usability (e.g. aesthetics, effectiveness) and psychological and behavioural indicators (e.g. perceived trustworthiness and intent to use). Both quantitative and qualitative data was analysed to understand users' perceptions, behaviour and attitudes towards the re-launched website. A Structural Equation Model (SEM) was developed to identify the factors affecting their intention to use the new website. The SEM model identified the impact of a variety of factors on intention to use and the descriptive analysis, using both qualitative and quantitative data, highlights further areas of research.

Keywords Website usability · Tourism · DMO · DMS · SEM

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1 Introduction

This paper analyses a case of re-launching a destination website in the UK, evaluates its success, and identifies the key factors affecting the customers' intention to use the new website. A large-scale online survey was conducted with potential customers. Both quantitative and qualitative data was analysed to understand users' perceptions, behaviour and attitudes towards the re-launched website. A Structural Equation Model was developed to identify the factors affecting their intention to use the new website.

2 Literature Review

The survey questions were based on key literature in the area and drew on some of the findings identified in a review of tourism website evaluations by Ip et al. (2011), relating to usability factors. Over the past 5 years trust (or lack of it) has been highlighted as a key factor influencing the purchase of holidays online and even cited as a factor that could impede growth (Choi and Au 2011). A number of different factors can influence a person's perception of trust, e.g. features of the website itself (e.g. security icons, currency of information) as well as individual differences of customers (e.g. gender, age). Ganguly et al. (2011) studied the influence of website characteristics on trust in online travel portals by developing a causal model. This identified the relative importance of the different website characteristics, to generate trust in online travel portals. Additionally they included what they called 'customers' personal variables' (demographic variables) that could moderate the relationship between these antecedents and trust. Although their model offers insights into the relative importance of website characteristics and individual differences contributing to trust in travel portals it has not so far been tested.

Satisfaction is a key outcome or dependent variable in many studies. Choi and Au (2011) found that e-brand image and user web experience were significantly correlated with the establishment of online trust for travel products and also that user web experience and online brand trust had significant positive impacts on the satisfaction level of customers' online purchasing experience. Social media is playing an increasingly important role in all stages of the travel journey, e.g. as an initial information source, through to use during a holiday and post-holiday evaluations (Xiang and Gretzel 2010). Sanchez-Franco and Rondan-Cataluna (2010) examined the influence of virtual travel communities in the acceptance of online services, and found that visual aesthetics and usability had a significant impact on satisfaction and trust. They concluded that, "design variables, satisfaction and trust lead the users to develop high customer loyalty; and, purchase involvement is an important moderator to engage in online service relationships" (2010, p. 171). Bing et al. (2011) found that a complex interface and advertising messages confused most users and called for a simpler and more intuitive interface.

3 Background

The case reported in our study is a DMO called VisitWiltshire, which is responsible for promoting the county of Wiltshire for tourism. The old VisitWiltshire destination marketing site was viewed as dated and not containing inspirational content. Instead of improving the existing website, the VisitWiltshire board felt that "the old website is unsustainable in its current format and therefore requires a fresh approach" (DMS developer proposal to VisitWiltshire). While no consumer research was conducted on the previous website, VisitWiltshire felt it was no longer fit for purpose as a destination marketing tool. The content was static and, while informative, lacked inspiration; there was little use of social media to build deeper engagement with visitors; the homepage was functional and the site lacked effective imagery. Fast moving Internet technologies are providing many new opportunities for innovating destination marketing websites but which may require significant changes in order to implement them. Furthermore the role of the DMO has undergone seismic changes in the last 2 years with increasing pressure to become more marketing focused and in this regard the website plays a key role as a destination portal site that provides a space where tourism businesses can be promoted within the destination context. Therefore, a decision was made to adopt a radical change approach by re-launching a completely new website and to take advantage of new functionality and design features provided by the DMS developer. After a number of consultation meetings with the DMS developer, VisitWiltshire business user groups and the VisitWiltshire online marketing group, the following objectives were articulated by VisitWiltshire 8 months ahead of the website build:

1. To build a new website that is dynamic, visually engaging and will generate commercial benefits.
2. To promote VisitWiltshire as a key leisure and tourism destination via the website.
3. To position VisitWiltshire website as a key tool that visitors will use to find detailed information on W as a tourist destination.
4. To engage key stakeholders and members in a shared agenda supporting VisitWiltshire's website objectives.
5. To help to increase and retain members.
6. To improve VisitWiltshire's ranking in organic search.

The pilot web site was tested with members of the Online Marketing Group for feedback and a large-scale user survey was conducted in November 2012 before the formal launch of the web site. The following sections describe the methods used and data analysis on the success of the re-launched website from customers' points of view.

Table 1 Information collected in the survey questionnaire

Category	Details
Respondent profile	Household income, education, age group, gender, IT skills, marital status, Internet experience
Attitudes towards risk	Online booking risk perception, importance of information to reduce the risk, attitudes towards online booking without contacting the seller by phone, attitudes towards reducing risk by reading reviews, unwillingness to book online
First impression of the homepage	Right level of information, easy to find information, engagement, inspiration, trust
Usability	Easy to navigate, effective, engaging
Information quality	Relevance, timeliness, accuracy, trusted, easy to understand, level of details
Entertainment and inspiration	Inspirational to use, attractive virtual appeal, usefulness of "ideas and inspiration" section
Trust	Confident booking, trust provider, security of personal information
Benefits of social media	Sense of community, easier to communicate with providers, easier to communicate with other visitors, helping plan the holiday, help booking, enhance trust, compliment to the information on the site
Intention to use	Recommendation, intention to use for holiday plan, intention to book, plan to visit regularly, plan to subscribe, brochure request
Overall satisfaction	Level of overall satisfaction of the site

4 Research Method

The main objective of our research reported in this paper is to understand the DMO users' perceptions, behaviour and attitudes towards the new website. This has been achieved mainly through a large-scale customer survey. The survey incorporates both closed and open questions. Most of the questions are attitudinal using a 7-point Likert scale to measure the level of respondent's agreement with the statements that cover a wide range of areas about the website. The open questions give the respondent the freedom to express their own positive and negative comments about relevant features of the website, such as "what do you like most about the website?", "what do you like least about the website?", "What would you do to improve the website?". Based on the relevant literature on factors affecting web site success, the survey attempted to collect users' perceptions on the first impression of the homepage, usability, information quality, trust, entertainment and inspiration, overall satisfaction, and intention to use. Table 1 provides a summary of the areas covered in the survey.

5 Survey Results Analysis

The survey invitation was sent to approximately 13,000 email contacts using the VisitWiltshire database. Most of the contacts were people who had requested a VisitWiltshire brochure in the last 5 years. By the deadline of 2 weeks, a total of 206 responses were received and after further examination of the questionnaires, a total of 183 responses were valid for data analysis.

5.1 Qualitative Data Analysis

The survey questionnaire contained a number of open-ended questions inviting respondents to provide their comments on the re-launched website. Nearly all respondents offered their opinions, indicating good responder engagement with the survey. Three questions requested comments on the homepage (questions 2, 3 and 4) and three more on the website generally (questions 11, 12 and 13), and a final question (question 30) asked for further comments. The first six questions were analysed using keyword analysis; this was considered most appropriate, as many responders had just entered one or two words. The final question was analysed using thematic analysis, as responders tended to include paragraphs made up of a few sentences. The findings generally supported the quantitative data presented above, but additionally provided extra contextual detail.

Analysis of the first three items relating to the homepage showed that users paid particular attention to images, with the terms 'Photos', 'Photographs' or 'Picture' featuring as the top word in the most liked, least liked and suggested changes of the homepage. This confirms the importance of images in initial perception of a webpage, identified by Nielsen and Pernice (2010). Q2 asked, 'What did you like most about the homepage?' and resulted in 'Photos, Photographs, or Picture' receiving 48 responses, with 'Colourful attracting 33 responses' and 'Bright' attracting 17 responses. Q3 asked, 'What did you like least about the homepage?' and again 'Pictures' attracted the highest number (20), with 'Busy also high at 19 responses and Little at 15. Q4 asked 'What would you do to improve the homepage?' Photographs/Pictures was the top response (26), Images (9) and Cluttered (9).

Q11 asked, 'What did you like most about the site?' and the top two answers related to Ease of use (n = 17) and Easy to navigate (n = 13)—there were 129 responses. When asked 'What did you like least about the site?' (Q12), there were less responses (93 responses) and no issue attracted a large number of responses, with the three top words having 9 incidences each: Photos, Blue and Busy. Q13 asked 'What would you do to improve the site?' and again, the term 'pictures' featured as the top item with 15 incidences, followed by map with 8.

These strong findings relating to the importance of images confirm the work of Nielsen and Pernice (2010). In their series of website evaluation studies using eye tracking technology, Nielsen and Pernice (2010) found that users determined

whether an image was worth looking at in their first peripheral glimpse of it (in a matter of milliseconds) and only fixated on it if it was of benefit to them. Their studies found that users paid close attention to images that contained relevant information, but tended to ignore those images used purely to decorate a page or used to encourage a 'feel-good factor'. This was the same when images of people were used; users preferred photos of real people, rather than stock photos of models. The specific features of images are categorised on page 197 of their book and are repeated here. Images looked at most included those that were: high contrast and high quality, cropped, rather than overly reduced, not excessively detailed and so easy to interpret, highly related to the content on the page. The features that make images magnetic included: smiling and approachable faces, people looking at (or at least facing) the camera, sexual anatomy, and appetising food. People ignored images that had the following characteristics: low contrast and low quality, too busy for the space, look like advertisements, are not related to content on the page, include people or objects that are generic or obvious stock art, are cold, fake, or too polished. Although an analysis of the actual images used in the website was not carried out, it is clear from the comments that positive features expressed by users showed remarkable similarity to those features identified by Nielsen and Pernice (2010) as images looked at most (colourful and bright) and least (busy and cluttered).

Question 30 asked if there were any further comments or observations and although this item was optional, there were 53 responses highlighting good customer engagement with the survey and task. The super ordinate theme of 'usability' was identified as covering nearly all comments, with three sub ordinate themes eventually used to categorise the comments: negative and positive and suggested ideas. The majority of the comments replicated those included as responses to questions 2, 3, 4, 11, 12 and 13 described above. However, a noticeable addition was that it is noticed many links to indicators of future intention to use the website (again supporting the quantitative items), for example: "As a former resident of Wiltshire region I thoroughly enjoyed everything the website had to offer and I will definitely use it in the future." "At this time I am not intending to visit the area, but the website will be very useful when I do." "One of the best sites I've visited. It made me WANT to look further." Even further, some comments indicated that the webpage had achieved the outcome of changing holiday intention, for example: "This makes me want to visit Wiltshire again!" "This has prompted me to consider Wiltshire as a holiday destination."

5.2 SEM Analysis

Structural Equation Modelling (SEM) and AMOS have been used to identify the key factors affecting users' intention to use the new website. The reason for choosing this statistical method is its ability in calculating latent variables and accounting for measurement errors in the estimation process (Hair et al. 2010).

Before conducting the SEM analysis, data was screened carefully. Four cases were removed from the sample due to a high number of missing values. Also to meet the requirements of SEM, a normality test was conducted and variables were transformed where necessary. At the end of the data screening stage there were 183 useable responses to conduct the SEM analysis. According to Anderson and Gerbing's (1984) and Hair et al. (2010), the minimum sample size required for a SEM model containing less than five constructs with more than three indicators each and high commonalities (0.6 or higher) is 100–150 which is below the number of respondents for this study; therefore, there are enough cases to conduct the SEM analysis.

Our SEM analysis intends to provide a parsimonious view of the key factors affecting the intention to use. Therefore, the research focused on how "home page", "information" and "trust" affect the intention. Most importantly, a new dimension of "the first impression of home page" is introduced to the model because the study attempts to understand how the first impression of "Home Page", which is the main page of a website, affects the intention to use. In order to explore how the Home Page impacts on the intention, the study intends to explore the mediating effect of overall website satisfaction. While Kim and Fesenmaier (2008) evaluated the extent to which a website homepage creates favourable first impressions, their research did not extend to include intention to use. This study attempts to investigate how the first impression of "Home Page" impacts on the overall website satisfaction and the intention to use, thus contributing to the body of knowledge in this field.

Therefore, a research model as shown in Fig. 1 was proposed to test the following key research hypothesis:

H1: The first impression of the homepage is positively related to intention to use.
H2: Trust is positively related to intention to use.
H3: Information quality is positively related to intention to use.
H4: Overall site satisfaction is positively related to intention to use.
H5: Homepage is positively related to overall site satisfaction.

The first step in a SEM analysis is Confirmatory Factor Analysis (CFA). The model was constructed, based on the theoretical framework, and tested using the CFA method. All the factor loadings are above 0.6. The result of the CFA shows that the data fits the proposed model. Table 2 shows the criteria that have been used to test the model fit.

The next step is establishing convergent and discriminant validity as well as reliability of the variables (Table 3). Composite Reliability (CR) is used to test the reliability of the variables. The CR values for all the variables were above the threshold value ($CR > 0.7$) (Hair et al. 2010). To test convergent validity, Average Variance Extracted (AVE) is calculated and compared with CR measure. To meet the convergent validity criteria, all the AVE values should be above 0.5 and all the CR values should be above AVE values ($AVE > 0.5$ and $CR > AVE$) (Hair et al. 2010). For the discriminant validity test, Maximum Shared Squared Variance

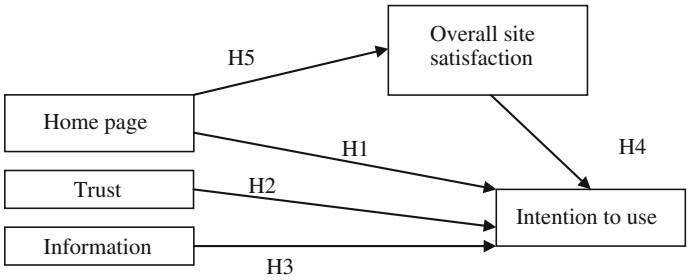

Fig. 1 Research model

Table 2 Model fit criteria

Variable name	Value	Acceptable range (Hair et al. 2010)
CMIN/DF	1.649	<3 (good)
CFI	0.970	>0.95
AGFI	0.855	>0.80
RMSEA	0.060	<0.05 good; <1 moderate
Standardised RMR	0.049	<0.1

Table 3 Validity and reliability of the constructs

	CR	AVE	MSV	ASV
Info	0.919	0.694	0.529	0.508
Home	0.903	0.651	0.496	0.392
Trust	0.916	0.784	0.579	0.475
Intention	0.820	0.609	0.579	0.481

(MSV) and Average Shared Squared Variance (ASV) were calculated. These two measures should be less than AVE of the variables (MSV < AVE and ASV < AVE) (Hair et al. 2010). Table 3 shows the values of CR, AVE, MSV and ASV for each variable.

Table 4 represents the correlation between constructs. Values on the diagonal of the table are the square root of AVE for each construct, which should be greater than any correlation value in that column/row.

The next stage of the analysis involved testing the hypotheses. A structural model was constructed based on the theoretical model. Figure 2 shows the path model that has been used to test the hypotheses of the study. Computer skill, Education and Income are the control variables. Homepage, Trust, Satisfaction and Information are the independent variables and Satisfaction and Intention are the dependent variables. To make the model less complicated, covariance between control variables and independent variables are set invisible. After running the specified model, model fit was tested again. Table 5 shows the values for model fit.

Table 4 Correlation between variables

	Info	Home	Trust	Intention
Info	0.833			
Home	0.704	0.807		
Trust	0.707	0.589	0.885	
Intention	0.727	0.578	0.761	0.780

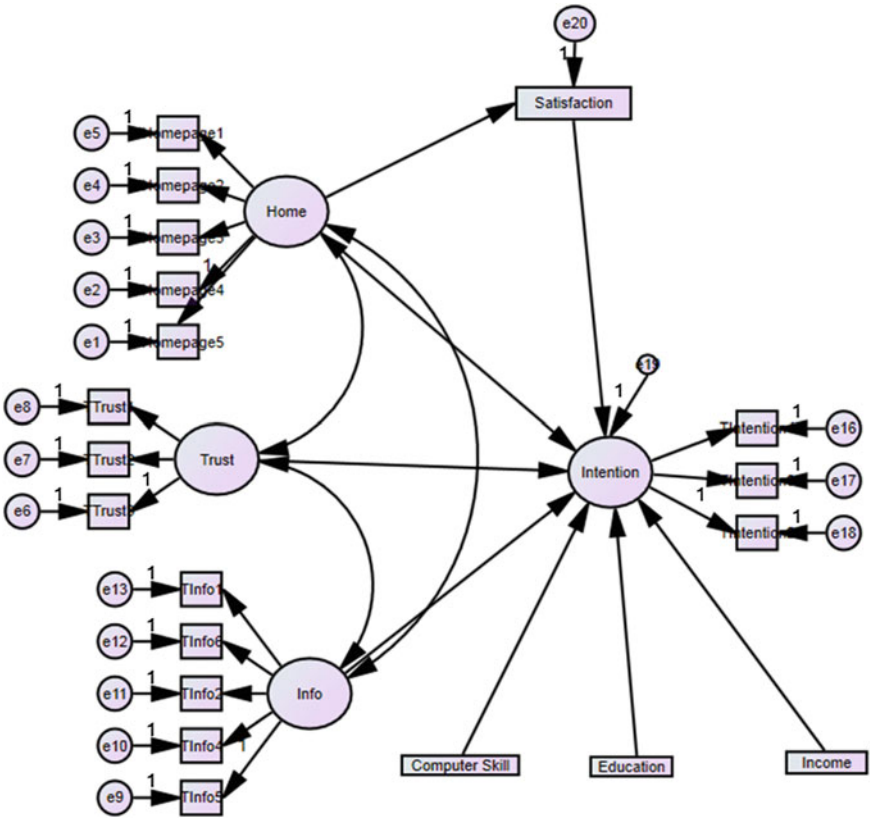

Fig. 2 SEM model with control variables (covariance between control variables and independent variables are set invisible)

All the values were in an acceptable range and therefore this model was accepted for hypothesis test.

Figure 3 shows the result of the SEM analysis. Hypothesis H2 (information and intention), H3 (trust and intention) and H4 (overall website satisfaction and intention), and H5 (homepage and satisfaction) are supported. The results suggest that Trust is significantly related to intention ($\beta = 0.512$, $P < 0.001$). Information is also positively and significantly related to intention ($\beta = 0.295$, $P < 0.01$). The

Table 5 Model fit criteria

Variable name	Value	Acceptable range (Hair et al. 2010)
CMIN/DF	1.791	<3 (good)
CFI	0.950	>0.95
AGFI	0.824	>0.80
RMSEA	0.066	<0.05 good; <1 moderate
Standardised RMR	0.056	<0.1

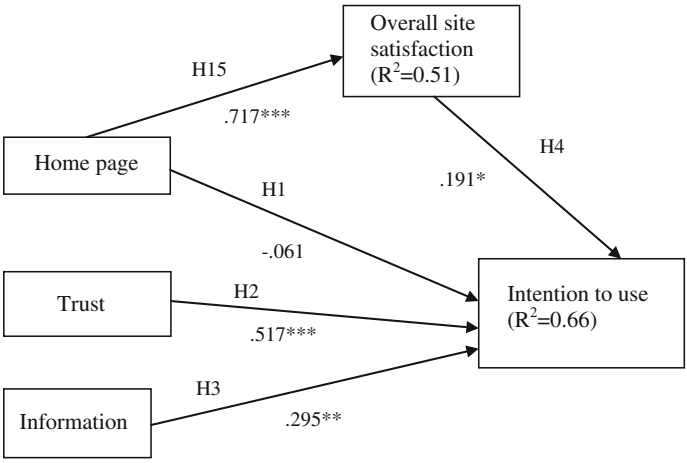

Fig. 3 Hypothesis test results

other significant relationship in the model was the relation between satisfaction and intention ($\beta = 0.191$, $P < 0.05$). The result shows that satisfaction positively impacts on the intention. Although the homepage does not directly affect the intention to use, the analysis reveals that homepage impression impacts significantly on the overall website satisfaction ($\beta = 0.717$, $P < 0.001$) and overall website satisfaction, in turn, significantly affects the intention to use. Therefore, the homepage indirectly affects the user intention. No other relationships are significant in the model. R square value of the model for intention is 66 % and for satisfaction is 51 %, which suggests that the model is effective in explaining the key factors contributing to the dependent variables. The model was also tested for indirect relationships using modification indices, however there were no indirect relationships between variables.

6 Conclusions and Discussion

The online leisure and tourism landscape has changed significantly over recent years with new channels and markets opening up all the time. This paper examines an attempt by a regional UK DMO to improve its marketing by adopting a radical

change approach and launching a new website. VisitWiltshire has completely re-designed its website and added new functionality provided by its DMS developer. It has also incorporated a range of popular social media sites. The paper presents an analysis of the survey of the re-launched website from users' perspectives. Our attempt in understanding the journey and the success of VisitWiltshire's website improvement has involved a range of activities and revealed many interesting insights in terms of VisitWiltshire's strategy development, stakeholder involvement, innovation adoption, role of technology suppliers, etc. However, this paper only focuses on our attempt to analyse the web site from customers' perspectives.

The research has attempted to establish the key factors affecting users' intention to use the website using SEM. The SEM model has identified the impact of homepage, information, trust and overall site satisfaction on the intention to use. Income, education and computer skills are used as control variables to test their influence on the users' intention. The results of the SEM analysis demonstrate that the proposed research model is effective in explaining contributory factors affecting the intention to use (R2 66 %). Hypotheses 2–5 are supported and H1 is indirectly supported. This shows that trust, information quality and overall site satisfaction are likely to trigger actions associated with intentions to use, including repeat site visitation, online search and booking and registering on the site for further information and direct contact. The study also confirmed that the homepage plays a role in intention to use, mediated by overall site satisfaction. This is a reassuring finding for VisitWiltshire as substantial effort was put into the design of the homepage including in-depth consultation with the Online Marketing Group, which VisitWiltshire has established to help guide its online marketing strategy. The study revealed that users are generally very satisfied with the new website and have high levels of intention to use the website. This finding is supported by the qualitative data gathered during the survey, for example: "… I thoroughly enjoyed everything the website had to offer and I will definitely use it in the future." "One of the best sites I've visited. It made me WANT to look further."

While these are encouraging findings for VisitWiltshire, the DMO will need to continue monitoring the website usage, especially to develop tangible indicators to make sure the website is sustainable and remains competitive. One area that this study has demonstrated requires specific monitoring is the use of images. Analysis of the first three items relating to the homepage showed that users had strong views on images, with the terms 'Photos', 'Photographs' or 'Picture' featuring as the top word in the most liked, least liked and suggested changes of the homepage. The influence of website imagery on user behaviour and intention to use is an area that warrants further research. For example, further work collecting perception of images and time on webpage using an eye tracker could investigate the finding of Kim and Fesenmaier (2008) who found that "visually appealing stimuli are the most important tool for converting Web site lookers to users and/or making them stay longer on the Web site" (2008, p. 10). Additionally, a detailed analysis of the images in terms of the characteristics that Nielsen and Pernice (2010) identified as linked to perception and attention could be investigated. As images result in a consistently positive or negative response, the biographic data could be further

investigated to identify more specifically what types of images appealed to users. It may well be that the presentation of the webpage can be adaptive, e.g. a different set of pictures for male users versus female users, and younger versus mature. Age could be an important yet under-investigated factor. For example, Djamasbi et al. (2010) investigated presence or absence of specific web characteristics on the visual appeal for a specific age group—Generation Y aged 18–31 years. Through an online survey they identified the preferences of this age group and then through an eyetracking study they confirmed what attracted their attention. They concluded that Generation Y might prefer pages that include a main large image, images of celebrities, little text, and a search feature.

A further line of inquiry is the use and influence of social media, which is now fully recognised as an effective marketing channel (Gretzel et al. 2012). The questions relating to social media in this study were answered by only one-third of respondents, rendering it too small a sample for a SEM analysis. However for those who did respond, they had very positive attitudes towards the use of social media for example for improving communications, enhancing trust, developing the community, and providing complementary information; although their answers varied more widely than in other areas. The role of user-generated content on social media in influencing user behaviour is an emerging and important line for further inquiry in the DMO sector (Hays et al. 2013). The challenge for DMOs is to evaluate closely how a social media presence on its destination website influences overall behaviour and in particular intention to use.

This research has a number of limitations, including sample bias and a low response rate for social media questions. However the research model and its associated measures provide scope for developing future research, such as to study intention with samples from different contexts, in different geographic locations, or using specific design elements of website. Although the old website was regarded as out of date and needing to be revitalised with a fresh approach, the research is not able to conduct any formal comparative analysis between the old and new site due to the lack of validated quantitative data of the old site. This is still a research in progress paper and more empirical data will be collected to conduct a longitudinal analysis of users' perception, attitudes and actual usage of the website over a period of time.

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The Website Quality of the Regional Tourist Boards in the Alps: Ten Years Later

Luisa Mich

Abstract To evaluate the quality of the websites of the regional tourist boards was a main objective of a large triennial research project on tourism in the Alps started in 2000. In that context an in-depth evaluation of the official websites of the Alpine regions highlighted a number of best practices and critical issues as well. The evaluation model developed for the study has been updated and applied on the same regional websites to check their evolution. This chapter presents the main results of a cross-country analysis, comparing them to those obtained 10 years ago. The conclusion from the data is that almost all the websites have enhanced their quality performances. However, there are still large margins of improvement and the adopted method allows to identify the website quality dimensions on which a regional tourist board could focus its interventions.

Keywords Website · Quality evaluation · Quality model · Alps destination · Regional tourist board

1 Introduction

Tourism plays an important role for the Economy of the Alps (http://epp.eurostat.ec.europa.eu/portal/page/portal/tourism/introduction, [Aug. 28, 2013]; http://mkt.unwto.org/en/barometer, [Aug. 28, 2013]; Secretariat of the Alpine Convention 2010; Bartaletti 2007). Being the Alps spread across many countries, and due to geographical, political and cultural factors, the organization of the tourism sector in the Alps is based essentially on regional tourism boards (RTBs) (Franch et al. 2002). Also, focusing on the RTBs, conditions are

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comparable and the number of RTBs to be analysed is manageable yet enough to allow for an in-depth study. RTBs websites are the main hubs of their web presence strategy (Pechlaner and Weiermair 2000; Baggio 2012; Marchiori et al. 2012; Inversini et al. 2012) and this is true also in the present context, characterized by Web 2.0 technologies and applications (Mich 2010a). The quality of the alpine RTBs websites was evaluated in the framework of a large research project on tourism in the Alps realized from 2000 to 2003 (Franch et al. 2003). Information to develop a customized website quality model starting from a multi-dimensional meta-model (Mich et al. 2003; Mich 2010a) were given by the other lines of the research. This information regards the characteristics of the alpine tourism offering and demand, and focused, respectively, on the role of tourist boards and on the user behaviour on the websites. Requirements for the websites were then interpreted as questions at two different levels of details and applied in two large evaluation projects (Mich et al. 2003). The studies highlighted a number of best practices (Mich et al. 2004) and critical issues as well (Mich et al. 2003; Mich and Franch 2003).

Ten years later, the RTBs' awareness of both, the importance of their role as destination management organisations (DMOs) and of building up and maintaining a quality website has increased. This can be seen from the proceedings of past enter conferences (www.ifitt.org/home/view/enter-resources, [Aug. 28, 2013]), and, for the first issue, from the success of the dedicated track (Destination Track Presentations); for the relevance of the website quality, a bibliography on website quality is available at http://etourism.economia.unitn.it [Aug. 28, 2013].

The last decade has also seen significant changes in the Web, which in turn have raised new business challenges (see e.g., Lytras et al. 2009). The result is a completely new scenario. Back in 2002, many of the most successful social networking websites like, e.g., Facebook or Twitter did not exist (http://en.wikipedia.org/wiki/List_of_social_networking_websites, [Aug. 28, 2013]) and the term Web 2.0 was not popular yet (O'Reilly wrote his seminal article in 2005, http://oreilly.com/web2/archive/what-is-web-20.html, [Aug. 28, 2013]). In this context, in which website quality management has to be viewed as an ongoing process (see e.g., Pressman and Lowe 2008) we re-evaluated the quality of the Business to Consumer (B2C) websites of the RTBs of the Alps. The goal was to update the results and to compare them with those obtained in 2002 (Mich and Franch 2003; Mich et al. 2003; Mich et al. 2004). To this end, the evaluation model developed for the study has been revised and applied on the same regional websites. In this chapter we present the main results of the cross country analysis. The study highlighted that most of the websites—that have been completely re-engineered in the last years—improved their quality. The multi-dimensional model also allows to identifying weak and strong points of the websites, giving the RTBs information for effective decisions on the website interventions.

The rest of the chapter is structured as follows. Section 2 describes the study, introducing the quality evaluation model and process adopted for the project and their application to the websites of the RTBs in the Alps. Section 3 presents the

main results, focusing on the comparison with the results obtained in the study run 10 years ago. The last section discusses the finding and highlights the open questions, the limitations and illustrates possible future work.

2 The Study

2.1 Method

The evaluation method, including the quality evaluation process and model, is described fully in the chapters cited in the introduction. We briefly list key points of this method here to explain the approach we are using for the present study.

A website quality evaluation process envisages three main phases: set-up, design and realization. In the *set-up phase*, information about websites mission, the purpose of the evaluation and the users' requirements is gathered to initialise the evaluation project. In particular, giving the goal of the study—comparing the quality of the RTBs websites with results obtained in a study realised 10 years ago—the following activities had to be completed:

- a revision of the URLs of the websites of the RTBs included in the first project;
- a revision of the evaluation table, to take into account the evolution of the technologies and of the DMOs web presence strategies.

The objective of the *design phase* is to specify the assessment modalities. It includes decisions on the language to use for the evaluation, as RTBs websites have many linguistic versions; the order in which to evaluate the websites; the characteristics to be included in the evaluation model; and the evaluation techniques and tools to apply.

Finally, in the *realization phase*, the quality model is applied to the set of RTBs websites according to the choices made in the design phase and results are integrated and analysed.

2.2 Evaluation of the Websites of the RTBs in the Alps

Set-up Phase Table 1 reports the URLs of the RTBs websites obtained checking those used in 2002 and looking in the national websites if changed (i.e., not all the domains used for a given RTB are reported). It resulted that 46 % of them have modified their URLs (in italics in Table 1). Some of the RTBs have adopted a more intuitive and meaningful (e.g., suedtirol vs. hallo, visittrentino vs. trentino) or shorter domain name (e.g., burgenland vs. burgenland-tourismus), others have moved to new top-level domains (.info vs..com,.it vs..to). Unfortunately, not all the changes are good. Some RTBs have not redirected the old URLs to the new

Table 1 Websites of the RTBs in the Alps

Region	State and official language	URL (http://www.)
Alto Adige/Suedtirol	I, Italian/German	*suedetirol.info (hallo.com, redirected)*[a]
Friuli Venezia Giulia	I, Italian	turismofvg.it
Lombardia	I, Italian	*turismo.regione.lombardia.it (inlombardia.it, different destination)*
Piemonte	I, Italian	*piemonteitalia.eu (regione.piemonte.it/turismo, inactive)*
Trentino	I, Italian	*visittrentino.it (trentino.to, redirected)*
Valle d'Aosta	I, Italian	regione.vda.it/turismo
Veneto	I, Italian	*veneto.to (*http://turismo.regione.veneto.it*, inactive)*
Burgenland	A, German	*burgenland.info (burgenland-tourismus.at, blog in German)*
Kärnten	A, German	kaernten.at
Oberösterreich	A, German	oberoesterreich.at
Niederösterreich	A, German	niederoesterreich.at
Salzburger Land	A, German	Salzburgerland.com
Steiermark	A, German	steiermark.com
Tirol	A, German	tirol.at
Vorarlberg	A, German	*vorarlberg.travel (vorarlberg-tourism.at, redirected)*
Graubünden	CH, German/Italian	graubuenden.ch
Berner Oberland	CH, German/French	berneroberland.ch/tourismus
Zentralschweiz	CH, German	centralswitzerland.ch
Canton Ticino	CH, Italian	*ticino.ch (ticino-tourism.ch, redirected)*
Canton de Vaud	CH, French	lake-geneva-region.ch
Valais	CH, French	*valais.ch (valaitourism.ch, redirects to different linguistic versions)*
Riviera Côte-d'Azur	F, French	*cotedazur-tourisme.com (crt-riviera.fr, redirected)*
Provence Alpes-Côte d'Azur	F, French	*tourismepaca.fr (crt-paca.fr, redirected)*
Rhône-Alpes	F, French	rhonealpes-tourisme.com
Slovenia	SLO, Slovenian	*slovenia.info (slovenia-tourism.sl, inactive)*
Bayern	D, German	bayern.by

I Italy, *A* Austria, *CH* Switzerland, *F* France, *SLO* Slovenia, *D* Germany
[a] Modified URLs in Italics

ones (Piemonte, Veneto, Slovenia), or adopted an URL that is still not intuitive (e.g., piemonteitalia.eu).

As regards the revision of the quality evaluation model, successful websites have to satisfy a variety of quality criteria (Pressman and Lowe 2008). Our approach is based on the 7Loci meta-model whose first name was 2QCV2Q, later renamed 2QCV3Q to include a feasibility dimension (Mich et al. 2003); the 7Loci framework has been applied in a number of projects since 1998. The model used in 2002 was defined in an iterative process that identified the quality criteria related to the 7*loci* or dimensions of the meta-model (Table 2). In formal terms, the process

Table 2 The dimensions of the 7Loci meta-model

Ciceronian locus	Quality dimension
Qvis? (Who?)	Identity
Qvid? (What?)	Content
Cvr? (Why?)	Services
Vbi? (Where?)	Identification
Qvando? (When?)	Maintenance
Qvomodo? (How?)	Usability
Qvuibus Avxiliis? (With what means?)	Feasibility

'instantiated' the meta-model [the instantiation process has been formalized in Mich et al. (2005)] and produced as output a table of 95 Boolean questions, distributed as follows: 15 for the dimension Identity, 27 for Content, 12 for Services and Identification, 8 for Maintenance, 18 for Usability, 3 for Feasibility. The complete table and an explanation of the classification of the questions in the 7loci can be found in (Franch et al. 2003). Compared with other models we used to evaluate the same set of websites, e.g., the standard table including 26 domain-independent questions, the first represents a 'heavyweight' model in which each dimension is investigated in a more detailed way (Mich et al. 2003). In particular, a less detailed, or lightweight, model can be used if the aim of the project is to compare the RTBs websites to identify possible benchmarks. But as the goal was to identify critical issues and best-practices for the design or re-design of the website for a tourist destination a more specialised model had been developed and applied.

Ten years later, to re-evaluate the website quality of the RTBs in the Alps, it was necessary to update the quality model to take into account the evolution of the technologies and of the DMOs web presence strategies. At the same time, the evaluation model had to be changed carefully to allow the comparison of the results with those obtained in 2002.

The 95 questions of the 2002 table were analysed by two tourism and quality experts in three steps: in the first step they were asked separately to identify questions that had to be modified or cancelled; in the second steps experts worked together and discussed those questions, modifying them if possible; cancelled questions related with outdates issues were replaced by new ones to introduce new relevant issues. Finally, in the last step, another expert checked the new questions to reduce any ambiguity, and the entire table to verify its consistency with the old one. At this point, the table was applied by two researchers working independently to a limited number of websites. Their observations led to a reformulation of some questions and the end result was a table in which 15 of the questions were modified and 13 new (http://etourism.economia.unitn.it/publications/24.pdf).

Most of the changes are related to the dimension Identification (1 modified and 6 new questions), to Usability (6 modified and 2 new questions) and to Feasibility (2 new questions). Many changes are due to technical evolutions of the websites languages and standards (www.w3.org; Zeldman 2009). In particular,

functionalities based on interactive maps can now be added to the websites; the use of web standards as Cascading Style Sheets (CSS), improves their accessibility and flexibility; Really Simple Syndication (RSS) feeds allow the notification of updates to registered users. Other changes are due to the availability of new tools or data; for example the tool GrayBit (http://gray-bit.com) helps to test a page's perceived contrast; data about a website's popularity and performances in Alexa (www.alexa.org; an agency that gives a lot of data about the most visited website for free) are used to assess some attributes of the Feasibility dimension (*Traffic rank* and *Sites linking*) and of Usability (Alexa tells how fast does a given website load compared to the average for all other sites). Finally, in the revised table, visibility of the site with different browser is assessed for a more recent version of Explorer (8 vs. 5.0 in 2002), and for Mozilla Firefox 6.0 instead of Netscape 4.0.

Other new questions were added to include additional features relevant for the tourist offering in the Alps, such as, online booking of private accommodation, and linguistic versions for new target markets (e.g., Russia, Poland, and China). But most of the new questions are related to Web 2.0 and social networks (Sassano et al. 2009). In the 2002 table, there was only one question to investigate if on the website it was possible to exchange testimonies with other users regarding experiences in the region (even with such a generic question, the answer was positive for only 4 websites). In the new table there are four questions to check *Sharethis* functionalities for social networks. Beside, one question checks if the site offers hotel reviews, another Web 2.0 feature expected by tourists (http://www.tripadvisor.com/ PressCenter-i5569-c1-Press_Releases.html). An in-depth analysis of the presence of the RTBs on social networks and content sharing platforms is the goal of another study which will use a conceptual framework including presence matrixes and maps (Mich 2010b) (Table 2).

Design Phase The objective of this phase is to identify the appropriate evaluation modalities. For an equitable evaluation and comparison of results, most of the choices are the same made for the study run 10 years ago (Franch et al. 2003). Therefore, the evaluation table defined in the set-up phase has been applied by experts according to the following criteria:

- The language to use is the official language of the region as indicated in (Franch et al. 2003).
- Even if it is the first in the 7Loci meta-model, the dimension Identity has to be evaluated after the dimensions Content and Services; Identity includes features that can be assessed more correctly after the other two dimensions.
- To obtain more homogeneous assessments without having to open all the sites of the different RTBs (26), an expert has to complete a parallel analysis of each dimension of the sites coming from the same nation.
- Whenever possible apply automatic tools; tools have been identified updating those used in the previous study and are available for some questions related to the dimensions Identification, Maintenance and Usability, that is to the more 'technical' issues.

- If a region is known for different types of tourism, e.g., mountain and sea tourism, focus on the section dedicated to the alpine tourism. It happens for example for all the French regions and for most of the Italian regions (4 out of 7: Piemonte, Lombardia, Veneto, Friuli Venezia Giulia).

Realisation Phase In the realisation phase, the table defined in the set-up phase was applied to the 26 RTBs' websites in April (for testing it) and May 2012 (for the evaluation of the websites). Each website has been evaluated by two experts separately, answering the 95 Boolean questions with yes or no. The evaluators were also asked to add for each question relative to every dimension any relevant remark or comment. These comments are useful to justify the evaluation and give useful information to identify critical issues and best practices as well. When the evaluations of the two experts resulted different, a third evaluator was involved to find a shared position. Sometimes, the problem was related to temporary problems, but more often, to questions for the dimension Identity, the most subjective to evaluate. However, divergences raised useful discussions highlighting other relevant issues. The performances of the websites for each dimension have then been integrated in an excel file to be analysed and compared to those obtained in the study run in 2002.

3 Results

The results of the application of the 95 Boolean questions of the evaluation table are summarised in Fig. 1 (percentage of positive answers; another analysis compared the results considering different kinds of average on the dimensions of the 7Loci meta-model and results are very similar).

One of the first observations is that none of the websites obtained a positive answer to all the questions. The best result is for the website of Oberösterreich with 91 % of positive answers. Its weakest dimension is Usability (4 out of 18 questions are negative); the most critical problem is that the average time to load the home page is higher than the average according to Alexa; also, the website does not offer a reservation box on the homepage (a feature that is available on 14 out of 26 of the websites). The worst of the website obtained 35 % of positive answers, being just a little bit more than a cover page for Luzern and its four local destinations.

Websites of the Austrian RTBs are the most homogeneous, even if there are differences among the performances on the dimensions of the 7Loci; e.g., Content ranges from 26 out of 27 positive answers of Oberösterreich to only 17 out of 27 for Vorarlberg, which also have a negative answer for all the 3 questions for Feasibility. Performances of the Swiss websites vary from a minimum of 35 % to a maximum of 83 %. For Italian websites we have a minimum of 60 % and a maximum of 89 %. Also French websites are quite different. Similar variability was also observed in the evaluation results of 2002 (Table 3). It is important to notice that most of the websites of regions with different kind of tourist offering, as

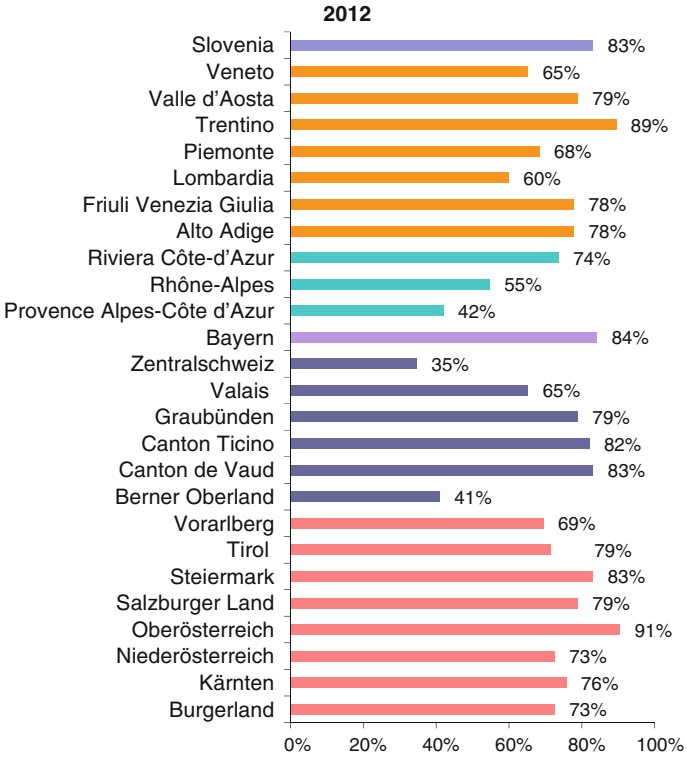

Fig. 1 Websites quality of the RTBs in the Alps in 2012 (percentage of positive answers)—a cross-national comparison

that of the French RTBs, Veneto, Lombardia, Piemonte and Zentralschweiz have lower performances, confirming the difficulties to design and realize a website for regional destinations with a more diversified offering. For the Italian RTBs it is interesting to notice that results of the 2012 study are confirmed by another study (Baggio and Antonioli 2011) in which Trentino resulted the first, with good performances for Friuli Venezia Giulia e Alto Adige. Lombardia, is going to host the EXPO 2015 and has revised its regional website in the last months, but in 2012 it still was the worst among the Italian websites.

The analysis of the results for the single quality dimensions showed that the best results are related to Identity (with an average of 12 positive answers out of 15), Usability (14 out of 18), and Maintenance (6 out of 8). On the other side, for Services and Content results were lower (7 out of 12 and 19 out of 27, respectively). Identification and Feasibility results are slightly better, with 8 out of 12 and 2 out of 3.

Positive results for Identity, Usability and Maintenance could be explained by an increasing diffusion of the culture on these subjects, thanks to web marketing and web engineering, two disciplines that have undergone dramatic changes in the last 10 years.

A closer analysis to the most critical characteristics highlights problems similar to those obtained in the 2002 study. In particular, if for Content, almost all the websites give information on different kind of accommodations or for the activities in the region, many do not give information important to adequately support the promotion of the region: they do not contain information on the traditions and folklore, on the handicrafts and typical local products, or the landscape. Other questions relevant for sustainability strategies received a negative answer for many websites, among them those on public transportations in the region, natural parks, activities different from skiing to moderate the environmental impact of winter tourism, but also to address climate challenges.

Questions for the dimension Services related to online reservation received a negative answer for many websites. There are many sites that do not allow to purchase holiday packages directly on-line. Also, on many site a tourist could not book accommodation completing the entire transaction.

For Identification, a quality dimension which investigate also the use of social networks to promote the region, there are 5 RTBs that have not started yet to consider them in any way. These RTBs do not allow users to signal them on their Facebook or Twitter or other profiles, do not have them following their own profiles, do not offer a way to exchange their experience directly on the RTBs website, and do not include hotel reviews.

The other characteristics for the dimension Identification are related to the visibility of the website on the Web, i.e., results on SERP and the URL. While for the visibility on the search engines, results are positive for almost all the RTBs, many URLs could be further simplified and standardised.

Results for the last dimension, Feasibility, show that the popularity of the RTBs websites is very good for some of them, while others are out of the scope of Alexa as they do not reach the minimum threshold to be monitored; among them, all the French websites, the Swiss ones, with the notable exception of Ticino and Canton de Vaud, 3 out of 8 of the Austrian websites, and the website of Veneto. Table 3 summarises the positive answers for each dimensions.

The results of the 2012 study have then been compared with those obtained in 2002. Table 4 shows that almost all the websites of the RTBs in the Alps have improved their quality. However, there are websites that were better 10 years ago and they are also those with worst performances in the 2012 study. Looking for a possible explanation, it can be found in the results of the 2002 study. The study highlighted that RTBs with the highest quality websites were those characterized by an integrated or semi-integrated organizational model and based on a state of the art platform for destination websites (Mich and Franch 2003). That seems not the case for those websites. Looking for a possible explanation, it can be found in the results of the 2002 study. The study highlighted that RTBs with the highest quality websites were those characterized by an integrated or semi-integrated organizational model and based on a state of the art platform for destination websites (Mich and Franch 2003). That seems not the case for those websites.

The results of the comparison suggest that if the adoption of better technologies or a graphical redesign of the websites, which is the case of most of the

Table 3 Affirmative answers for each dimension

Dimension—# of questions	Identity 15	Content 27	Services 12	Identification 12	Maintenance 8	Usability 18	Feasibility 3
Region							
Alto Adige	14	23	7	7	6	14	3
Friuli Venezia Giulia	13	20	7	9	7	16	2
Lombardia	10	15	4	8	5	13	2
Piemonte	11	20	6	8	6	12	2
Trentino	15	23	8	11	8	17	3
Valle d'Aosta	14	24	6	4	8	16	3
Veneto	12	18	4	6	7	14	1
Burgerland	12	20	8	7	6	15	1
Kärnten	13	21	5	9	7	15	2
Oberösterreich	13	26	11	11	8	14	3
Niederösterreich	8	24	11	3	8	14	1
Salzburger Land	14	21	10	9	4	14	3
Steiermark	14	24	10	8	7	14	2
Tirol	14	22	9	9	6	13	2
Vorarlberg	14	17	3	10	6	16	0
Graubünden	15	22	8	9	7	14	0
Berner Oberland	10	7	2	3	5	12	0
Zentralschweiz	9	2	3	2	6	11	0
Canton Ticino	14	23	6	10	6	17	2
Canton de Vaud	14	23	7	9	8	16	2
Valais	12	19	6	6	7	12	0
Riviera Côte-d'Azur	13	21	7	10	7	12	0
Provence Alpes-Côte d'Azur	12	2	5	7	5	8	1
Rhône-Alpes	10	17	2	8	5	10	0
Slovenia	13	24	6	10	6	17	3
Bayern	13	23	8	9	8	16	3

Table 4 Websites quality of the RTBs in the Alps: comparison with the 2002 results

Region	Nation	2012 (%)	2002 (%)
Oberösterreich	A	91	80
Trentino	I	89	77
Bayern	D	84	73
Canton de Vaud	CH	83	58
Slovenia	SLO	83	62
Steiermark	A	83	74
Canton Ticino	CH	82	83
Graubünden	CH	79	70
Salzburger Land	A	79	66
Tirol	A	79	79
Valle d'Aosta	I	79	67
Alto Adige	I	78	68
Friuli Venezia Giulia	I	78	60
Kärnten	A	76	70
Riviera Côte-d'Azur	F	74	64
Niederösterreich	A	73	75
Burgenland	A	73	74
Vorarlberg	A	69	75
Piemonte	I	68	54
Veneto	I	65	46
Valais	CH	65	66
Lombardia	I	60	62
Rhône-Alpes	F	55	65
Provence Alpes-Côte d'Azur	F	42	63
Berner Oberland	CH	41	45
Zentralschweiz	CH	35	50

investigated websites, could improve its quality, a real improvement can be obtained only with the adoption of a more structured organization for the RTB as DMO. However, to confirm such hypothesis requires further analysis of the evolution of the organization models of the RTBs in the Alps, like the one realised in the study described in (Franch et al. 2003). Besides, Table 3 also highlights that Canton de Vaud, Slovenia, and Veneto improved in about 20 features. Among the Italian region, Piemonte also improved its website, however, results could have been better given that in 2006 this region hosted the winter Olympics event.

4 Conclusion

In this chapter the main results of a study was presented, which goal was to check if and how the website quality of the websites of the RTBs in the Alps is changed in comparison with the performances obtained in a study run 10 years ago. The 2012 study shows that almost all the websites have enhanced their quality

performances. It also confirms that the website quality of the RTBs in the Alps varies significantly.

The results allow a RTB to compare its website with competitors and to identify the weak points for the seven dimensions of the quality model. However, to better focus these results, they had to be completed with the analysis of the quality of the other online 'presences' of the RTBs. This is the goal of a future work. Beside, results of the evaluation can be correctly interpreted and used for decision making activities only in the context of the tourism strategy of a specific region: this is the reason way statistical analysis has been limited to the very first descriptive level: aspects that are very important for a region could be secondary for another, yet they could have been negatively impacted in the evaluation. Qualitative results gathered during the study are going to be collected and used as guidelines and best practices for a (regional) tourist board website, like that published after the first study (Buccella et al. 2005).

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Hotel Websites, Web 2.0, Web 3.0 and Online Direct Marketing: The Case of Austria

Ioannis Stavrakantonakis, Ioan Toma, Anna Fensel and Dieter Fensel

Abstract Direct communication with customers in order to increase sales has become one of the most important marketing methods used by small, medium and large hotels alike. With the rapid development of ICT technologies, including the Internet, Web, and recently Web 2.0 and 3.0, the number of channels in which hotels can interact directly with customers has grown even larger. Being visible on all these channels and using these technologies has now become a requirement if effective marketing and massive direct sales are to be achieved. In this chapter, we perform a rigorous empirical analysis of the advances towards the employment of Web 2.0 and 3.0 technologies in the tourism domain. We begin by presenting our methodology, including criteria and evaluation metrics, and follow by analysing the uptake of Web 2.0 and 3.0 technologies for Austrian hotels. As this chapter demonstrates, despite the benefits of new Web technology for online marketing, the hotels in Austria are not using these technologies and do not follow the online developments. Since employing their use is a relatively cheap undertaking, a severe competence gap seems to emerge either directly in the touristic service industry, or in the industry providing them with their on-line presence.

Keywords Social Web · Semantic Web · Semantic annotations · Austrian hotel business

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1 Introduction

Tourism is one of the core sectors of the Austrian economy, accounting for around 9 % of Austria's GDP (Wikipedia 2013). In 2007, Austria ranked 9th worldwide in international tourism receipts, with a total of 18.9 billion US$ (Wikipedia 2013), and a total of more than 121 million overnight stays (Statistik Austria 2013). By 2012, an 8 % increase can be noticed with a little over 131 million overnight stays (Statistik Austria 2013). Tourism has comparable influence on the economic and social situation of Austria. Therefore, possessing all of the required key competencies necessary for running this economic sector is of great strategic importance for Austria. Losing a cornerstone of this process could lead to a significant loss of income and revenue.

The rapid advance of ICT technologies, and their increasing importance in the tourism domain, has led to an exponential growth in online communication opportunities. This includes the websites of the touristic service providers, other websites (e.g., the website of the Tourist Board, Wikipedia, etc.), email, email lists, chat, instant messaging, news, message boards, internet fora, blogs, microblogs, podcasts, photo and video sharing, collaborative tagging, social networks, mobile platforms, recommendation sites, booking channels, destination management websites, search engines and meta-search engines, rich snippets, semantic annotations, etc. In addition, high visibility and ranking in popular search engines such as Google, Yahoo or Bing is also a key goal that any online presence must not neglect. Known as Search Engine Optimization (SEO), this goal can be achieved mainly by having accurate, relevant, up-to-date annotations in the formats and vocabularies that search engines understand and use as part of their internal search mechanisms.

All channels mentioned above are important means of implementing successful online marketing and driving sales. These are no longer an option for touristic service providers, but a necessity. Maintaining competence and competitiveness in online marketing for tourist service providers, coupled with ubiquitous access, interaction and book ability of the services they provide through mobile devices, may therefore be key to the future prosperity of Austria. This chapter analyses the online presence and marketing of a large, representative set of Austrian touristic service providers ranging from small to large hotels and hotel chains. We perform an empirical analysis of the usage pattern of the Web, particularly, Web 2.0—Social Web—and Web 3.0—Semantic Web—technology for their online presence. We begin by introducing our work through research questions and presenting related studies (Sect. 2). Next, we introduce the methodology setup for the analysis (Sect. 3). We then analyse the online presence of touristic service providers based on our results (Sect. 4), and finally conclude in Sect. 5.

2 Related Work and Research Questions

The application of internet technologies in the tourism domain has been the topic of several scientific studies which focus specifically on the adoption of classical internet/web technologies by hotels. For example, Murphy et al. (2006) evaluates the internet adoption by analysing 200 Swiss hotel websites and email responses. Automatic techniques based on complementary multivariate and artificial neural networks help in the evaluation and classification process. Chan and Law (2006) focuses on the usability of websites, effectiveness of interface, amount of information, ease of navigation and user friendliness of a dozen hotels from Hong Kong. Schegg et al. (2002) explore a small slice of the soaring travel marketplaces, investigating how 125 Swiss hotels use Web-based marketing tools. The study focuses on classical Web technologies and finds that most hotel websites broadcast static information but provide limited transactional functions (e.g., rates, offers, etc.). A more recent study coming from the same group (Schegg et al. 2008) analyses the application of Web 2.0 technologies for more than 3,000 tourism businesses. At the time of the study, the authors concluded that most of the tourism enterprises were in the early stages of applying Web 2.0 concepts to their businesses. Scaglione et al. (2013) revisit the results of Schegg et al. (2008), showing the evolution of this adoption over the period 2008–2012. The set of criteria used in Schegg et al. (2008) is adopted and complemented in light of the technological progress that occured during the period previously mentioned. A total of 4,700 tourism websites in Europe have been analysed by primarily looking at the general use of Web 2.0 and Web 3.0 technologies. The authors conclude that while for some techniques the take-off phase is finished, for other new techniques, such as RDF, the tourism sector is still at the very beginning of the adoption process. The level of infiltration of Web 2.0 technologies in the tourism domain is the theme of several studies such as Ayeh et al. (2012) for the Hong Kong hospitality industry, or Stankov et al. (2010) and Shao et al. (2012) for destination marketing organizations (DMOs).

Other studies such as Grüter et al. (2013) focus more on analyzing the multimedia aspects of the hotels' online presence and the potential benefits of using these multimedia applications. Using the Swiss hotel business as an example, the study shows that while pictures appear on nearly every website, the use of videos and three-dimensional (3D) presentation formats is much less common. They stress that advances in multimedia formats such as videos and 3D presentations on hotel websites could have a positive impact on brand awareness, image and confidence in the hotel on the part of the customer.

Despite a large volume of studies available in the literature, none of them provide an extensive analysis of uptake of the Web technologies (Web 1.0, 2.0 and 3.0) in the tourism domain considering: (1) a large number of criteria from these areas and (2) including thousands of hotels, as in our study. Therefore, the research questions of this study are formulated as follows:

1. *To what extent do hotels in Austria exploit the Web 2.0 and 3.0 solutions?*

2. *Is the Content Management System related to the integration of Web 3.0 technologies?*
3. *Is there any correlation between the hotels' star rating with the usage of Web 2.0 and 3.0 technologies?*

In this respect, by investigating these questions, we aim to identify the adoption of Semantic Web annotations and Social Web channels and discover correlations between these, and the hotels' infrastructure. These results will help to observe and analyse any correlation between the current situation in online direct marketing and the extent that hotels are using the various technologies and means of communication on the Web through their websites. If the results indicate vast room for improvement, it would imply that online direct marketing could also bring better results and return on investment (ROI) by improving the situation and strengthening the online weaknesses.

3 Methodology

In this section, we introduce the methodology that we followed which comprises of: (a) the dataset specification as well as any technical decisions; and (b) the selection and evaluation criteria for the analysis.

We began by collecting data from various sources (Google Places, TripAdvisor) about the hotels that exist in Austria. Our dataset of hotels includes URLs, star ratings and geo-coordinates. The sample was selected randomly. Over 2,000 hotels were selected (i.e., 2,155 to be precise), and 75 % of the hotels selected have 3–5 stars. As shown in Fig. 1, they are distributed within the Austrian borders.

Our research workflow continues with the specification of the criteria with which we used to evaluate the dataset. Thus, our criteria can be divided into two main categories, namely the Web 2.0 direction and the Web 3.0 direction. In our case, the Web 2.0 represents the media that is mainly described as the 'Social Web'. Furthermore, the Web 3.0 represents the Semantic Web technologies that a hotel could apply on its website in order to gain more visibility on the web. Particularly, we focus on the existence of semantic annotations that could bring a hotel's website into a better position in search results of the major search engines (e.g., Google, Bing, Yahoo!, etc.) and with a richer presentation among the results by exploiting the opportunities that exist in the user interfaces of the search engines, such as in the case of Google with the Google Rich Snippets (Steiner et al. 2010).

The next step towards gathering the hotel websites' data was the implementation of a Web crawler that would access the hotels' websites and extract information about the criteria that we have specified and which are demonstrated in Sect. 3.1. Therefore, we built a Web crawler in Python based on a well-known open source high-level screen scraping and web crawling framework, i.e., Scrapy

Fig. 1 Geographic distribution of hotels in our dataset

(www.scrapy.org). For the storage of the crawled data, we preferred to use a NoSQL database, namely the MongoDB (www.mongodb.org), and store JSON objects with the distilled information from the various pages. It is worth mentioning that we set a limitation of depth for the crawler, i.e. three levels from the starting page, in order to achieve better performance. However, this limitation cannot affect the accuracy of our results as our criteria are met at the very first pages of the websites.

3.1 Criteria

The aim of our Web analysis is to unveil insights hidden at the HTML mark-up of the hotel websites by crawling the URLs of our dataset. We applied the criteria during the crawling process, rather than downloading the whole website locally. Our criteria cover the Web 2.0 major channels and the Web 3.0 technologies, namely the formats and vocabularies for semantic annotations, as shown in Tables 1 and 2, respectively.

Table 1 presents the Web 2.0 dimensions that we looked into during our analysis of the collected data, while Table 2 presents the Web 3.0 formats and vocabularies from which hotels could benefit.

As we were interested in the uptake of the Web 3.0, we focused on the existence or nonexistence of technologies used for adding semantic annotations (i.e., machine-readable metadata) to websites. In this respect, we distinguish between formats and vocabularies within our criteria. Formats refer to the technologies with which a web developer could add semantic annotations to a website. As shown in Table 2, there are three main formats, as broadly adopted options, namely microformats, RDFa and microdata.

Table 1 Web 2.0 criteria

Channel	Description	Crawling method in HTML
CMS	Content management systems are used to publish and modify the content of websites without dealing with the HTML code	Within the HTML head tag: < meta name = "generator" content = "*CMS Name*">
Facebook	Facebook offers social plugins and widgets for websites, adding a Social Web layer to the website	iframes, links, official embed HTML code
Flickr	Photo sharing web application. Mostly used by hotels to share high-quality photos from events and places	iframes, links, official embed HTML code
Foursquare	Location-based Social Network (LBSN) used by tourism businesses to keep in touch with guests during their stay	iframes, links, official embed HTML code
Google+	G+ is meant to be the social spine of the Google products (Seeking Alpha 2012), as it adds a social and sharing layer at every Google product	iframes, links, official embed HTML code
Instagram	Photo sharing mobile application. Mostly used by individuals to share experiences at real time	iframes, links, official embed HTML code
Pinterest	Pinterest is a web application used to collect and organize online entities (text, photos, links, etc.) about a topic, like places	iframes, links, official embed HTML code
RSS	Really simple syndication (RSS) keeps subscribed users of the RSS feed updated about content changes in a website	RSS links
Twitter	The most popular social network for micro-blogging that could help businesses connect with customers in real time	Widget, links, official embed HTML code
Vimeo, YouTube	Video sharing platforms. Hotels could benefit by sharing videos about their premises and events while also embedding those in their website	Widget, links, official embed HTML code
Tripadvisor, HolidayCheck	Review sites, where guests publish their experiences are considered to have very important impact to the conversion rates (lookers to bookers)	Widget, links, official embed HTML code

Table 2 Web 3.0 criteria

	Description	Crawling method in HTML
Formats		
Microformats v1	Semantic annotations re-using HTML tags in order to add metadata to the content	Vocabulary terms in HTML class attributes
Microformats v2	New version of the microformats standard. Introduces prefixes for which class names are used for microformats. Improves implementation and disambiguates the annotations from simple class names	Vocabulary terms in HTML class attributes
Microdata	An attempt to enable developers to annotate with semantics HTML items in a much simpler and effective way than microformats and RDFa	HTML tag attributes: itemscopre, itemtype, itemprop
RDFa	Resource description framework in attributes proposes attribute level extensions to XHTML in order to enable semantics to the presented web content	HTML tag attributes of the specification (e.g., vocab)
Vocabularies		
Schema.org	Joint effort of major search engines (Google, Bing, Yahoo!, Yandex) to provide a shared collection of schemas about various domains (http://schema.org)	HTML tag attribute: itemtype = "http://schema.org/"
Open Graph protocol	Enables any web page to become a rich object in a social graph. Mainly used by Facebook (http://ogp.me)	og: namespace (e.g., og:title)

Microformats (abbreviated as μF) are conventions used to describe a specific type of information on a web page (e.g., people, organizations, locations, etc.). In general, microformats overload the class attribute in the HTML tags to assign descriptive names to entities. They can be realised as format and vocabulary combined. The second version of microformats add prefixes to the terms in order to understand which class names are used by microformats (e.g., *u-photo* is used to annotate the URL of a photo).

Resource Description Framework in Attributes (*RDFa*) provide a set of mark-up attributes to augment Web page content with semantic annotations. RDFa are based on attributes by re-using HTML tags and defining namespaces in the XHTML to assign types and names to entities and properties. None of the attributes introduced or used by RDFa have any effect on the rendering of the web pages.

Microdata specification is similar to microformats, but introduces new HTML tag attributes (i.e. itemscope, itemprop, itemtype, etc.) that can host terms from any vocabulary. It is supported by schema.org and is part of the HTML 5 specification. In comparison to the aforementioned formats, we could say it combines ease of use, effectiveness and flexibility, all of which make it a great option for semantic annotations.

The results from our analysis, presented in Sect. 4, aim to answer our research questions.

4 Analysis Results

Following the methodology presented in Sect. 3, we collected data from more than 2,000 hotels in Austria, and from which we have gained some useful insight that will answer the research questions which we posed at the beginning of this chapter. The distribution of CMS systems is shown in Fig. 2 and Table 3. The percentages of Table 3 refer to the occurrences of the second column divided by the total number of websites with a CMS system (i.e., 946 out of 2,155 websites).

Studying the data in Table 3, it is evident that there is great diversity in the CMS decisions by the web development agencies. It is worth mentioning that we have information about the type of the CMS system for roughly 44 % of the dataset. The main reason is the way that this piece of information is extracted. Thus, we are able to capture only those CMS systems that specify their name explicitly within the HTML metadata fields. However, according to our knowledge, all the major CMS systems do so, which means that for the rest of the hotels we could say that they are not using any of the well-known and well-designed CMS systems or they do not use a CMS system at all.

The most popular CMS seems to be TYPO3 with 44 % frequency among the CMS systems retrieved for our dataset. In second place is the well-known Joomla! CMS and third is WordPress, which is mostly used for blogging. It is worth mentioning the fact that we observed the usage of systems, like Adobe GoLive,[1] which have not been available for the last 5 years. This fact implies that there are a significant number of hotels that have stopped investing in their Web presence as far as their website is concerned. It is common practice to update the website from time to time in order to keep the design and functionality aligned to the current paradigms and competitors' level.

Figure 2 offers interesting insight into the diversity. Thus, 27 % of hotels use other CMS systems rather than one of the popular (i.e., Drupal, Joomla!, TYPO3, WordPress, MS FrontPage). We observed 87 different CMS systems within the aforementioned portion of 27 %.

Regarding the adoption of Web 2.0 technologies, we measured the usage of the major Social Web channels (i.e., Facebook, Flickr, Google+, HolidayCheck, Instagram, Pinterest, RSS, Tripadvisor, Twitter, Vimeo, YouTube) within the websites of the hotels. We found that 53 % of the hotels in the dataset exploit the opportunities offered by the Web 2.0 by adding links on their websites to one channel or more of their Social Web profiles. However, this does not imply that the remaining 47 % of hotels are not present on the observed channels. It only highlights the fact that they have not connected those channels with their website. Thus, it can be the case that a hotel maintains a Facebook page but does not point the website users to it.

[1] *Adobe stopped development and sales of Adobe GoLive 9 software on April 28, 2008*, https://www.adobe.com/products/golive/.

Table 3 Distribution of CMS systems

CMS	Occurrences	Percentage (%)	Comments
TYPO3	424	44.82	
Joomla!	131	13.84	
WordPress	68	7.18	
Microsoft FrontPage	56	5.91	
Drupal	15	1.58	Drupal 7 only
Condeon	25	2.64	
Web to date	24	2.53	
ez Pubish	26	1.69	
CMS Contenindo	12	1.27	
Adobe GoLive	8	0.84	Unsupported since 2008

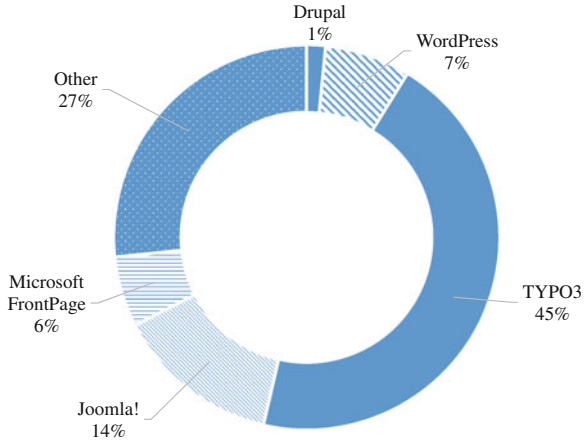


Fig. 2 Distribution of content management systems (CMS)

Furthermore, 68 % of the active Web 2.0 hotel websites (roughly 1,150), link their fan page or account to Facebook, while 48 % link to HolidayCheck. The potential of Twitter and Google+ seems to be realised by 14–15 % of the hotels in the dataset, while 25 % exploit YouTube and RSS as shown in Fig. 3. We measured more than 600 hotels linking to at least one review site.

The next step includes the analysis of the Web 3.0 (also known as Semantic Web) technologies uptake by the hotels in our dataset. The results in this dimension prove that most of the hotels completely ignore the existence of technologies that could enrich the website content with high level metadata and give machine readable meaning to the presented information. As shown in the pie chart of Fig. 4, only 5 % of websites employ some Semantic Web technologies, while the rest seem to ignore the potential of adding semantics to their websites.

Other than not being aware of the potential benefits and advantages the Web 3.0 can offer, another possible reason for lack of uptake could be the delays in the alignment of web development agencies with state of the art technologies in the field, or the hesitation to adopt Semantic Web technologies due to their

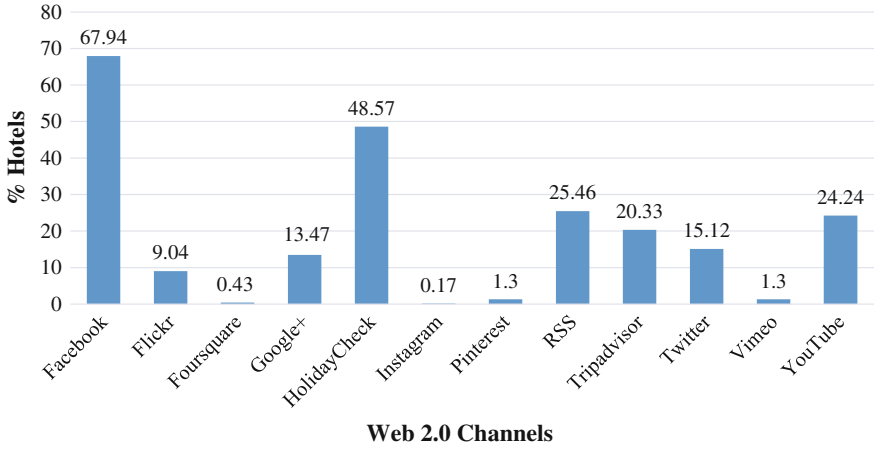


Fig. 3 Usage of Web 2.0 channels

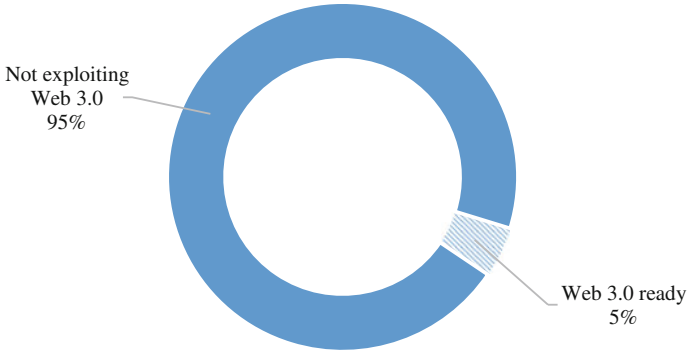


Fig. 4 Uptake of Web 3.0 technologies in the Austrian accommodation sector

complexity. However, semantic annotation technologies are already mainstream and widely applied on the Web.

Moreover, it is interesting to examine the distribution of the CMS systems in conjunction with the use of semantics as described in the second research question presented in Sect. 2. In this respect, Fig. 5 depicts the usage of CMS systems among the hotels which adopt Web 3.0 technologies, i.e. 5 % of the hotels in our dataset according to Fig. 4. The presented figures are related to the number of hotels that use a CMS, i.e. as mentioned earlier, 44 % of the hotels in our dataset.

In the case of "Web 3.0 ready" hotel websites, WordPress seems to hold the first position, while TYPO3 is in second. Thus, the distribution of Web 3.0 integration within CMSs does not follow the CMS usage distribution. It is remarkable that we did not observe any occurrence of Drupal 7 within this subset of hotels, as

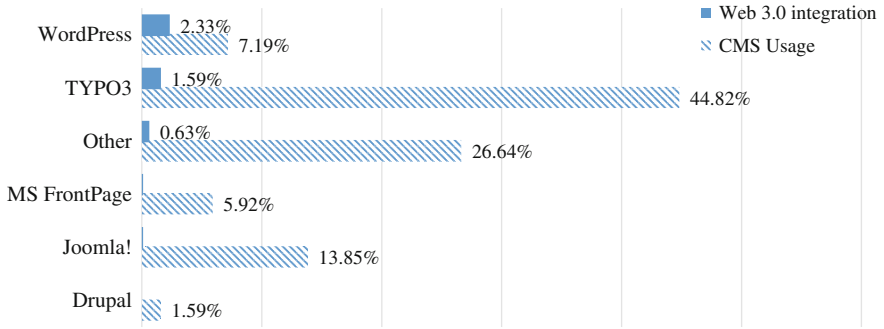
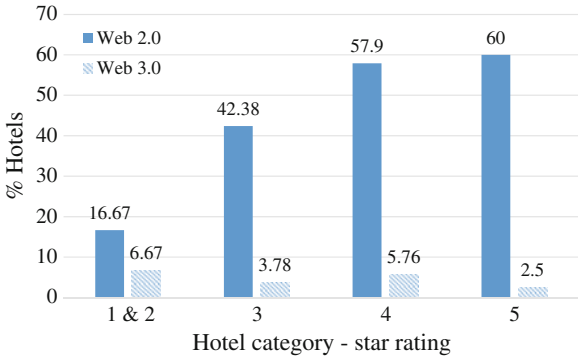


Fig. 5 Correlation of CMS systems and Web 3.0 integration

Fig. 6 Correlation of hotels applying Web 2.0–3.0 with number of stars



Drupal 7 is meant to be the most semantically friendly and supportive CMS at the time of writing, and to the best of our knowledge (Clark 2011).

Last but not least, we examined the correlation between the number of stars and the adoption of Web 2.0 and Web 3.0 technologies (3rd research question). Therefore, the diagram of Fig. 6 depicts the correlation among these variables. Hotels with one and two stars seem to be less responsive to the development of new web technologies and paradigms, like Web 2.0 and 3.0. This result can be expected, as the development of the onsite quality of services is of highest importance and takes priority over online presence, especially considering the limited budget available in most of the cases.

Furthermore, Fig. 6 demonstrates a proportional relationship between the number of stars and the percentage of hotels per category that link their websites with their Web 2.0 channels. Specifically, 42 % of the websites of three-star hotels make use of Web 2.0 technologies including RSS feeds, video and photo sharing services, like Flickr and YouTube, and Social Web channels, like Facebook and Twitter. While, an average of 59 % of four and five-star hotels make use of the Web 2.0 channels, the corresponding figures for the Web 3.0 adoption do not exceed 6 % of the websites in each category, which are not significant enough to

compare. The same situation more or less is observed in the remaining cases, meaning hotels rated with one and two stars.

Concluding from the data in Fig. 6, we can deduce that semantic annotations have a long way to go in order to bring the hotel websites to their full potential in terms of visibility on the Web search engines.

5 Conclusion

This chapter analyses the use of the new Web 2.0 and Web 3.0 technologies on a set of hotel websites in Austria. The aim of this work has been to explore the uptake of the related technologies, in order to identify the status quo of direct online marketing in the Austrian tourism domain, as online visibility is the cornerstone of advertising in today's world. In this respect, our approach has included crawling and extracting the information on the current use of modern technologies, such as Social Media (Web 2.0) and Semantic Web markup (Web 3.0), on the hotels' websites.

The analysis outcome has shown the current sparse usage of such technologies by the hotels' websites. The slow technology take-up is hindered by the technical (e.g., difficult integration due to the usage of heterogeneous CMSs within in the sector) and educational factors (e.g., knowledge about the new technologies and understanding of their advantages). Thus, there is large space for improvement regarding the visibility of the hotels on the current Web ecosystem. Failure to act on improving the use of the latest Web paradigms would keep the visibility of the hotels moderately low in search engine algorithms, as they are becoming more and more sophisticated. This fact prevents online direct marketing to be monetised via direct bookings and limits the impact of Online Travel Agencies (OTA) on the budget of the hoteliers.

Future steps have already been considered, including the expansion of the geographical region in which our criteria and crawling are applied in order to cover the whole of Europe. Furthermore, the criteria will be re-worked in order not to overlook any means of dissemination and added value within the website.

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Measuring the Perceived Image of Lithuania Through its Destination Management Organization Website

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Abstract It is generally acknowledged that the image of a tourist destination plays a significant role in the destination selection process. Consumers, while searching for destination information tend to choose a destination with a strong and favourable image. In order to design appropriate marketing strategies, it is therefore of paramount importance for a destination management organization (DMO) to understand what image exists in the minds of its potential consumers. In addition, it is vital to understand how the perceived image changes, depending on the communication channel being used. The following research aims to investigate how the destination image of Lithuania changed after the exposure to the DMO website. In order to carry out the research, a quasi-experimental design was used. The following research reveals that exposure to the DMO website facilitates change in one's perception of the destination image, particularly in its cognitive and unique components. The research findings contribute to the improvement of the online marketing strategy of the Lithuania's DMO.

Keywords Destination image · Image change · Lithuania · Destination management organization website

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1 Introduction

The image is considered as one of the main factors that determine the viability of a destination (Baloglu and McCleary 1999; Hunt 1975; MacKay and Fesenmaier 1997). Throughout the process of travel decision-making, consumers largely rely on their perceived image of a destination (San Martín and Rodríguez del Bosque 2008), and the more attractive this image is, the more likely their choice towards the selected place to be positive (Echtner and Ritchie 2003; Um and Crompton 1990). Moreover, given the growing adoption of Information and Communication Technologies (ICTs) and the global proliferation of the Internet in the tourism industry in particular, consumers are confronted with an array of choices as various destinations nowadays can be easily accessed and evaluated online (Buhalis 2000; Gretzel et al. 2006). Many researchers have stated that the Internet is becoming a prevailing source of information acquisition and its usage for travel search purposes is only expected to grow in the future (Xiang et al. 2009; Buhalis and Law 2008). Given this fact, it is highly important for a destination to establish an effective communication strategy which would project its strong and appealing image online as well as facilitate its differentiation from the competitors (Echtner and Ritchie 1993, 2003).

This paper aims to track the manner in which the DMO website facilitated image change. Therefore, it tries to contrast the organic pre-existing image in the minds of those respondents who have never visited Lithuania before, with the induced image formed after exposure to the online information source. The following research contributes to the body of destination image literature from a theoretical, methodological as well as practical point of view. First of all, the study explores the role of a DMO website as an online image formation agent for a country with a rather weak and distorted destination image. For this purpose, the country of Lithuania has been chosen, which despite being located in the center of Europe and possessing a variety of natural and cultural attractions, remains to be a relatively unknown destination among West European leisure travellers (Park 2009). In general, DMO websites place greater emphasis on destination identity in comparison with other non-governmental websites (Choi et al. 2007; Govers and Go 2005) and are considered to be one of the most important communication channels for a destination nowadays (Inversini et al. 2009). Therefore, the official DMO website (http://www.travel.lt/) seems to be an appropriate resource to track the image change in the case of Lithuania.

It is also important to stress, that the study doesn't intend to measure the impact of online content, design or interactivity of the given DMO website, but approaches it as being one of the destination communication channels. Hence, it is of interest to understand which image of Lithuania is being portrayed nowadays through the website and whether or not exposure to it may result in a positive image change. Secondly, the findings of the study have practical implications for the DMO of Lithuania as they may assist in the improvement of online marketing strategies of the destination. Thirdly, the study contributes to the body of literature

by enhancing knowledge about the experimental design as a method of data acquisition and further discusses its benefits and drawbacks for the given research aim.

The study has elaborated four research questions which are thought to address various dimensions of DI construct, while the overall research question has been formulated as follows: *Which image components are being significantly improved or eliminated after exposure the Lithuanian DMO website?*

2 Literature Review

There are many definitions of the destination image (DI) (for a detailed overview, see e.g. San Martin and Rodríguez del Bosque 2008) and all of them vary among scholars (Gallarza et al. 2002; Echtner and Ritchie 2003; Choi et al. 2007). Some early conceptualisations of DI (e.g. Crompton 1979; Hunt 1975) refer to it as to the sum of beliefs, ideas and impressions that a person has of a place, while some recent research envisages it as an attitudinal construct comprising both cognitive and affective dimensions as well behavioural intention toward a destination (e.g. Baloglu and McCleary 1999; Gartner 1993; Um and Crompton 1990).

Research by Gallarza et al. (2002) states, that DI is a rather complex construct with multiple dimensions, which has a dynamic nature. From this, it follows, that DI is not a static, but rather an evolving construct that changes depending upon the amount and quality of received information, or actual visitation to a place (Baloglu and McCleary 1999; Gartner 1993; Gunn 1972). Yet, Gunn (1972) suggests that images can either be organic or modified-induced. Thus, organic images are formed by passive information acquisition through media, education and other non-commercial sources of information. Induced images are created by promotional information sources e.g. brochures, magazine articles, and television, etc. while a person is actively seeking information about a destination, approaching it or is actually visiting it. Gartner (1993) further builds upon a work of Gunn's (1972), by elaborating a detailed typology of various information sources and their impact on the formation of the image. However, the given typology needs to be updated as it fails to address new online formation agents (Ghazali and Cai 2013; Govers et al. 2007).

Given how the usage of Internet for trip planning purposes has been continuously growing (Xiang et al. 2009), it can be assumed that various commercial or non-commercial online sources are becoming the new destination image formation agents. Therefore, one can examine how various online sources e.g. DMO websites, various virtual communities and social media platforms affect the image formation from a user's perspective, especially bearing in mind the fact, that the perceived image is not always the same as the projected image (Tasci and Gartner 2007).

However, when it comes to the consideration of DI measurement, a great number of scholars have reported that this procedure presents a major methodological

challenge (Choi et al. 2007; Echtner and Ritchie 2003; Gallarza et al. 2002). The complexity of DI measurement can be explained by different conceptualizations of the construct among scholars: there is no clearly defined conceptual base leading image research (Tasci and Gartner 2007) and therefore, there is no consensus regarding what is exactly understood as an image, what are its characteristics, causality effects between image and other concepts, etc. (Baloglu and McCleary 1999; Fakeye and Crompton 1991; Echtner and Ritchie 1993; 2003). In a review by Gallarza et al. (2002) and Pike (2002) it has been concluded that methodologies used to measure the concept are generally complicated and there is an evidence of researchers' strong preference for quantitative rather than qualitative techniques.

Govers et al. (2007) stated that one of the most influential studies in the area of destination image has been undertaken by Echtner and Ritchie (2003) who proposed a comprehensive three-dimensional model of image measurement. Thus, following Echtner and Ritchie (2003), a perceived image shall be concurrently measured from three perspectives: attributed-holistic, functional-psychological and common-unique, due the complexity of its construct.

In order to implement this measurement, one proposes to use a combination of structured and unstructured techniques to acquire both quantitative and qualitative data (Echtner and Ritchie 2003). Hence, given the need to acquire both qualitative and quantitative data, the following study applies the theoretical framework by Echtner and Ritchie (2003) to ensure the adequate measurement of the concept (Fig. 1).

3 Methodology

3.1 Experimental Design

For the aim of data collection, a quasi-experimental design (non-equivalent group design) was chosen. The authors believe that for the given research aim, an experiment is the most appropriate method as it is able to demonstrate a high level of internal validity in the case, like in the given paper, where the causal effect can be proven (Campbell and Stanley 1963).

Following the established methodological procedure of the experimental design, selected control (c. gr.) and experimental groups (exp. gr.) underwent pre- and post-tests (Campbell and Stanley 1963). During pre-test phase, the participants of both groups filled out identical questionnaires. At the next step, the experimental group underwent exposure to the DMO website, while the second group did not receive any treatment at all.

The DMO website was shown to the experimental group (http://www.lietuva.lt/en/) two weeks after the pre-test took place. 50 of 57 participants from the experimental group attended the event where the website was showcased. The five

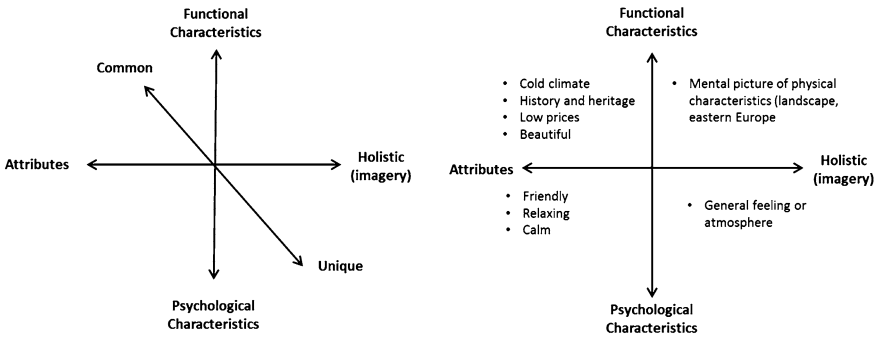

Fig. 1 Destination image framework (Echtner and Ritchie 2003)

participants who had previously visited Lithuania were excluded from the experiment as individuals, who have been to the country, are believed to already have a solid modified-induced image in their minds (Gunn 1972).

After this intervention, the experiment then went into its post-testing phase. Both groups were asked to complete the same questionnaires once again at this phase. After the post-test procedure, all the responses were checked once again for the individuals who might have visited Lithuania before, then separated into groups and the data, further analysed. One may argue, that under natural conditions of online information search, the students would be highly unlikely to visit the given destination website: their initial knowledge of the place was too limited and Lithuania would not have been included in respondents' awareness set. However, in line with the main objective of the study, researchers considered it as an advantage, which would allow tracking image change brought by the DMO website more precisely and exclude the possibility that other information sources would affect the image perception.

3.2 Data Collection and Sample Design

The data was collected over a four week period and the total number of respondents amounted to 114 (experimental group $n = 57$; control group $n = 57$). As mentioned before, the respondents for the experiment were not randomly selected; the researchers took already naturally "predefined" samples e.g. IMTE2011, IMTE2012, etc. (Tourism Master Degree Class of 2011 and 2012). Such selection of the sample aided the organizational issues of the experiment and facilitated the management in terms of time and data collection. Most of the participants were bachelor and master students in tourism in the age category of 18–31. The sample can be also characterized as highly international as students of more than 20 nationalities took part in the experiment. Nevertheless, the prevailing majority of

students came from Austria and Germany. The majority of respondents were single; the ratio between female and male was almost equal.

The first part of the questionnaire gathered basic socio-demographic data, while the second part consisted of three open-ended questions. The third part of the questionnaire presented a list of 35 attributes (the list of attributes was acquired from the literature review of previous DI studies (Crompton 1979; Echtner and Ritchie 2003) and a general question asking the respondent to describe Lithuania's image as positive, negative or neutral. Using a five point Likert-Type Scale (1 = strongly–5 = strongly disagree), participants had to express their opinion toward the statement. This one single question was the exception from the other statements, as it tried to get the overall impression of Lithuania through the following possible answers: (1) positive, (2) neutral, and (3) negative.

4 Results

4.1 Qualitative Data

The first research question of the study was formulated as follows: *Which holistic–functional (cognitive) image components are being improved or eliminated after the exposure to the website?*

While analysing the qualitative data, the authors followed the given algorithm. At the first stage, all responses belonging to one group (e.g. exp. gr. pre-test) and to the same question were pooled together and the content analysed, to identify the most frequently used semantic units. Traditionally, researchers use various computer-aided content analysis tools for the analysis of the qualitative data (see, e.g. Dickinger et al. 2011). However, due to the relatively small sample size (n = 57 pre- and n = 57 post for exp. gr. and c.gr.) and fragmented nature of the text (many responses were just phrases or one-word statements), researchers were able to manually identify the most frequently used words/collocations. Thus, the most frequent keywords/collocations were identified, their absolute frequency as well as relative share among all the keywords in the sample were calculated.

At the next stage of the procedure, the most frequent words and phrases were combined into themes and categories to facilitate further comparison between the results of the pre- and post-tests. For example, frequent terms such as "nature", "lakes", "forests" were combined into the final category "*Nature*"; "Baltic sea", "beaches", "coastal line" into "*Baltic sea*"; "medieval", "castles", "old town", "architecture" into "*Architecture*" and so on. In order to ensure intercoder reliability, the frequency tables and the final categories were built individually and later cross-checked by the researchers.

The same procedure was carried out for the pre-test data and the list of the final categories was formed. As the third and final step, the categories were compared

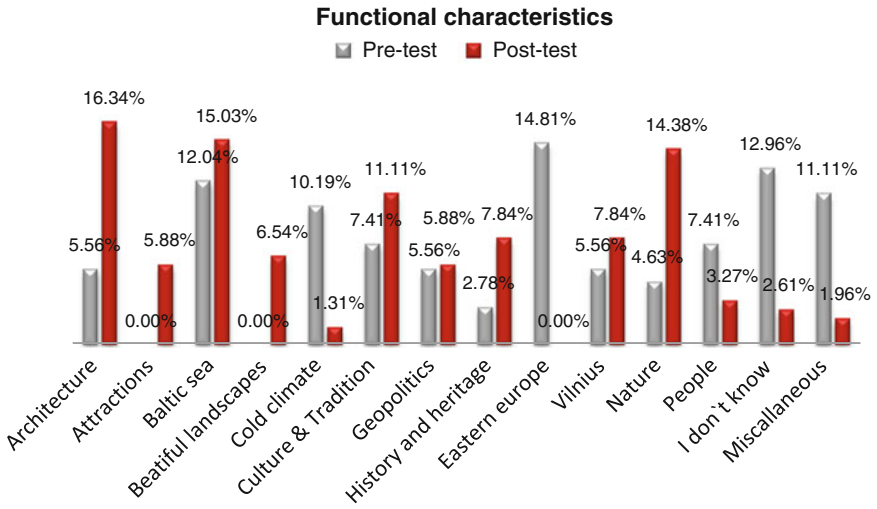

Fig. 2 Functional-holistic dimensions of the image

between the groups (exp. gr. pre and post-tests), which allowed one to identify which elements were eliminated or improved after exposure to the DMO website (Fig. 2).

In general, it is relatively questionable to compare qualitative data statistically but it is reasonable to do so, if it delivers useful conclusions. In our case, the results could be either compared according to the actual frequency of keywords/collocations or by their relative share within the context in percentage.

Without applying, for example, quantitative techniques such as paired T-tests, it is rather difficult to state whether the difference between pre- and post-tests is significant or not. Nevertheless, it is still quite obvious looking at percentage rates, that exposure to the website resulted in the appearance of new categories such as "*Attractions*" and "*Tradition*", which did not exist in the pre-test group. As described above, the following categories correspond to various symbolic attractions tourists might see or visit in Lithuania as well as the traditional heritage of the country.

At the same time, the category "cold climate" was almost eliminated at the post-test stage. Interestingly, the category "I don't know", which the respondents were asked to select if their knowledge on the subject was limited, was also considerably reduced after the exposure (−10.35 %). Furthermore, various words, phrases and statements, which could not be semantically combined into one category (e.g. "cheap", "mystic", "authentic", "nice", "similar to my country", etc.) were put into the cluster "Miscellaneous" at the pre-test stage.

Most importantly, the category "Eastern Europe" which comprised of keywords/phrases with rather negative connotations (e.g. "poverty", "undeveloped", "East Europe", "Russian influence", etc.) was completely eliminated after

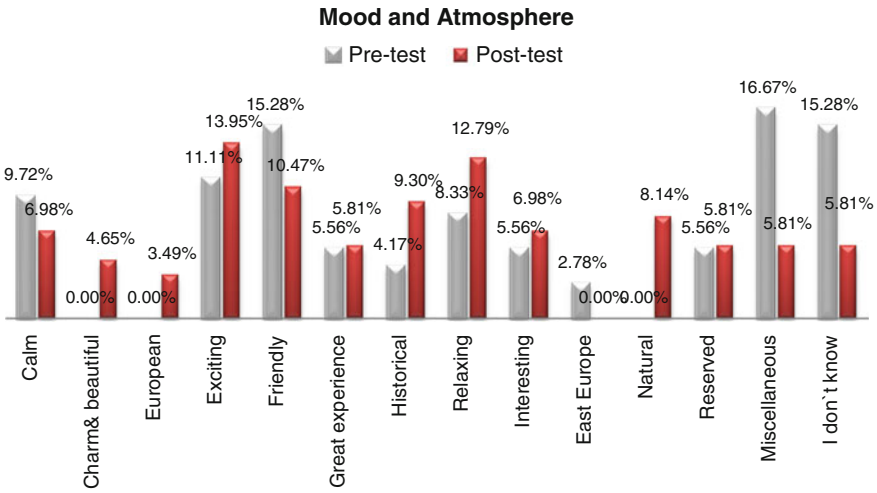

Fig. 3 Mood and atmosphere dimensions of the image

exposure to the website. This signifies that exposure to the DMO website changed the stereotypical and mostly negative cognitive image of Lithuania as an undeveloped Eastern European country with a Soviet past.

The second research question was formulated as follows: *Which holistic—psychological image components are being improved or eliminated after the exposure to the website?*

The results of the open-ended question (Fig. 3) reveal that the following categories were the most relevant categories at the pre-test phase: "Friendly", "Miscellaneous", "I don't know", referring to the absence of knowledge regarding the anticipated mood or atmosphere in Lithuania.

After exposure to the website, three new categories were formed: "*Natural*", "*European*" and "*Charming and Beautiful*". The stereotypical category "*East Europe*" was also eliminated after the exposure to the website, as in the case of the first question. However, generally speaking, qualitative data on respondents' affective evaluations received after post-test was rather scarce and the leading categories ("Exciting" and "Relaxing") had already been established at the pre-test stage. Moreover, the newly-formed categories cannot reveal to a full extent the affective evaluations toward Lithuania, because they seem to be very general and could be applied to describe any other European destination ("Charming and Beautiful", "European").

The third research question was formulated as follows: *Which unique image components are being improved after the exposure to the website?*

The exposure to the website revealed two new unique components (Fig. 4): "National parks" and "Castles". Within the category "National parks", keywords and connotations such as "Curonian spit", "Sand dunes", "UNESCO parks", etc., were included. The category "Castles" emerged after the exposure to the website

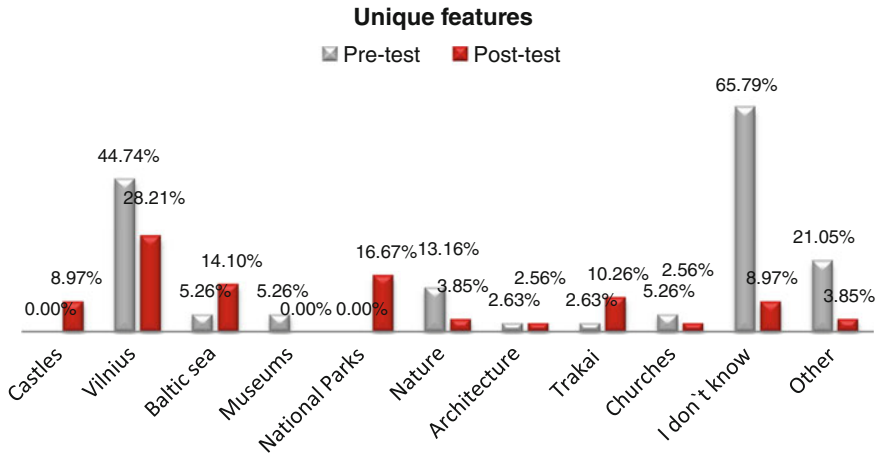

Fig. 4 Unique dimension of the image

and this testifies how medieval architecture sites made an impression on the respondents. The categories "Trakai" and "Baltic sea" had been previously mentioned, however, their relevance after the exposure to the website improved significantly. Moreover, the category "I don't know", which was the dominant theme at the pre-test stage, had decreased dramatically (from 39.68 to 8.97 %). Thus, it could be stated that the cognitive gap after the exposure the web source had diminished and various unique Lithuanian attractions had been successfully communicated via the DMO website.

4.2 Quantitative Data

To address the fourth research question and to identify which *attribute-based* functional and psychological image components had been enhanced after exposure to the DMO website, the quantitative data was analysed by a paired sample *T* test. The significant difference was identified in 9 out of 35 attributes (Table 1).

The following attribute: '*Attractive nature'* pre-test ($M = 2.6$, $SD = 0.89$) and post-test ($M = 1.9$, $SD = 0.97$); $t(57) = 6.2$, $p < 0.001$ suggests that a bigger number of respondents confirm the attractiveness of nature after exposure. The rest of the attributes that have shown noteworthy difference in the pre- and post-test of the exposure group are listed as follows: *attractive nature, favourable climate, sites and activities, sport activities, national parks, opportunities for relaxation, adventurous tourism and quality of service.* A supplementary question (Pair 1 on Table 1) about the *overall impression* of Lithuania has shown considerable positive differences as well. The average from the pre-test estimated $M = 2, 4$ (1 positive, 2 neutral, 3 negative) and from the post-test $M = 1, 7$.

Table 1 Attribute-based components of the image

Attribute		t	df	*P* value (sig. $p < 0{,}05$)
Pair 1	Impression–impression1	4.152	57	0.001
Pair 2	Nature–nature1	6.572	57	0.001
Pair 3	Climate–climate1	3.221	57	0.002
Pair 4	Activities–activities1	4.222	57	0.001
Pair 5	Sport–sport1	4.374	57	0.001
Pair 6	Parks–parks1	5.351	57	0.001
Pair 7	Relaxation–relaxation1	4.484	57	0.001
Pair 8	Adventure–adventure1	5.038	57	0.001
Pair 9	Quality–quality1	5.389	57	0.001

These results suggest a trend and potential for building a positive overall impression of the country, after intervention in the form of website exposure. Nevertheless, the quantitative data confirms the authors' assumption that Lithuania's attribute-based image was rather neutral. However, as verified by the experimental group, Lithuania's official tourism website facilitates the formation of a more favourable image by several attributes.

5 Discussion and Conclusion

As it can be inferred from the qualitative data analysis, the pre-test established that the participants of the experiment had little or no initial knowledge about the country. Due to this fact, respondents tended to associate Lithuania with some basic geographical landmarks as, for example, that it is located by the Baltic Sea, is rather small and has a cold climate. The respondents also demonstrated their stereotypical knowledge about the country, stating that it is a developing Eastern European destination. Others stated that Lithuania is poorly developed economically and still bears some Russian or post-soviet influence. Interestingly, the cluster "Eastern Europe" (14.81 %) was completely eliminated after the exposure to the online platform, which may suggest that a DMO website can be a successful communication tool in removing negative national stereotypes.

Another implication of the research is that the change of holistic-psychological components in comparison with holistic-functional and unique ones after the respondents' exposure was not significant enough. The leading categories after the experiment were "Exciting" (13.95 %) and "Relaxing" (12.79 %) which were already established prior to the exposure to the website (11.11 and 8.33 % correspondingly). Moreover, the exposure produced only two relatively insignificant categories "Charming and beautiful" (4.65 %) and "European" (3.49 %). Generally, affective evaluations facilitate decision-making and influence one's desire to travel or not to travel to a destination (Baloglu and McCleary 1999; Gartner 1993). Nowadays, in the era of global ICTs competitiveness, it is the aim of every

destination website to not only transmit relevant factual information, but also to be able to trigger positive emotional states so that the perspective tourist will be more likely to choose the destination for the vacation. The future research should investigate which components of the virtual tour may generate strong positive affective states for the destinations like Lithuania, which subsequently can bring about an improvement in their online marketing and positioning strategy.

When it comes to the unique attractions of Lithuania, the DMO website proved to be an effective communication medium to inform the participants about best landmarks of the country. The respondents have gained knowledge about national parks, the unique medieval architecture of the country, as well as UNESCO heritage sites (16.67 %) which can be visited at the destination. ("Trakai" = 10.26 % and "Castles" = 8.97 %).

Regarding the attribute-based image of Lithuania, not all the attributes, but only 9 out of 35 have shown a significant improvement. This leads to a conclusion that the exposure to the Lithuanian official website has certain impact on attribute-based image components. The fact that attributes such as "*Attractive nature*", "*Favourable climate*", "*National parks*", etc. had undergone positive change after the intervention, and these findings can be integrated into the online strategy of the DMO website in future. As a recommendation for the further research, it may be advised to implement factor analysis on 35 attributes in order to identify small number of items that explain most of the variance.

Generally speaking, it has already been proven, that virtual tours and online environment have a positive impact on the destination image (Cho and Fesenmaier 2000). However, given the diverse content of the online environment: official DMO websites, user-generated platforms and Social Media, websites of various private stakeholders, etc., one has to identify how each of the following communication channels has its particular way of facilitating the formation of a positive destination image. The following paper has implemented the main aim of the research and contributed from a theoretical point of view by proving that a DMO website can be a successful medium to transmit cognitive knowledge as well as unique destination attractions for a country with an initially neutral image, like Lithuania.

In addition, the paper also contributes to the literature from a methodological prospective: the framework of Echtner and Ritchie (2003) was tested in the context of the experimental design. The observations of the authors testify that the given framework is beneficial as it allows one to receive clearly structured responses and comprises of both structured and unstructured techniques. However, the participants at the pre-test were often complaining as they had no detailed knowledge about the destination to respond to, when it came to attribute-based questions for instance, and so asked if they could acquire additional information online before filling out the questionnaire. It may also be stated that one of the limitations of the research was that the participants of the experiment were not native speakers and therefore, researchers had some difficulties while analysing the qualitative data. Moreover, as it has already been mentioned before, the text of the qualitative part of the questionnaire was not always sufficient enough, as the responses were short

and not always self-explanatory. Therefore, for the future research, it may be recommended to implement rather personal interviews in order to ensure the collection of sufficient amount and quality of data.

Finally, the research provides some practical contributions to the Tourism Board of Lithuania, as the findings may be taken into the consideration by the authorities when designing or improving online positioning strategies of the destination. The research findings may be relevant as well, because an overwhelming number of the participants originated from the German-speaking market (Austria and Germany). Given how the top overnight EU arrivals for the year 2011 were generated by Poland (14 %), Russia (14 %) and Germany (12 %) (Bastis 2013, online), these findings may contribute to the elaboration and formation of new online marketing strategies targeting the German-speaking market.

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Examining Online Brand Image Dimensions from Hotel Managers and Customers Perspectives in Relation to Herzberg's Two-Factor Theory

Duangthida Nunthapirat, Andrew Lockwood, Brigitte Stangl and Hesham Al-Sabbahy

Abstract Given the scarcity of research regarding online brand image, this study is an attempt to generate an understanding of this topic in the hospitality industry from a holistic point of view. In order to gather this information, this study has carried out a detailed analysis of the brand attributes and marketing communication that determine hotel brand image in an online context. Semi-structured interviews with hotel marketing managers and customers were conducted and key dimensions underlying the differences between their perspectives were identified in relation to Herzberg's two-factor theory (1959). The results reveal that online brand attributes such as ease of use and content are seen as hygiene factors that impact customer perception, whilst site appearance and electronic word-of-mouth are motivational factors that hotel managers need to address in order to create a positive brand image in an online hotel context.

Keywords Online brand image · Herzberg's two-factor theory · Brand image · Hotel · Marketing · Internet

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1 Introduction

The significant implications of brand image for the hospitality industry in an online environment have received some research interest. The increasing number of Internet users impacts on the role of brand and the way hotel companies manage their brand image. Despite this importance, far too little attention has been paid to exploring the dimensions of brand image in the online context for the hotel industry. Empirical studies about the brand image perceptions of hotel customers are very limited, and there is a notable knowledge gap on the online brand attributes that affect those perceptions. This paper, first, discusses offline brand image formation, and then further elaborates the differences between offline and online brand image to provide a conceptual framework for the study. Then, the paper further discusses the differences between hotel marketing managers' perspectives and hotel customers' perspectives in relation to Herzberg's two-factor theory (1959). Finally, and significantly it presents the findings, including the implications from the study.

2 Literature Review

2.1 Brand Image

A review of the relevant literature suggests that brand image can be considered as the combined effect of brand associations (attributes, benefits and attitude), brand personality and marketing communications held in the consumer's memory (Aaker 1997; Biel 1992; Keller 1993; Park et al. 1986). However, now a customer's brand experience with hotel product and service information online becomes important in influencing his/her mind in regard to hotel brand image. This leads to question what the factors are that determine brand image in the online context, and how offline brand image is different from online brand image.

2.2 Online Brand Image and Its Dimensions

Christodoulides and de Chernatony (2004) suggest that a "brand" is a universal concept regardless of setting. This means both offline brand image and online brand image should present the same brand identity and that all that changes from offline to online branding is the enactment of the brand. Several attempts have been made to find out the attributes affecting website quality, and online store image (Wolfinbarger and Gilly 2003; Zeithaml et al. 2002; Perdue 2001), but only a few identify which online attributes influence brand image (Da Silva and Syed Aiwi 2008). Online brand attributes (such as personalisation, ease of use, security

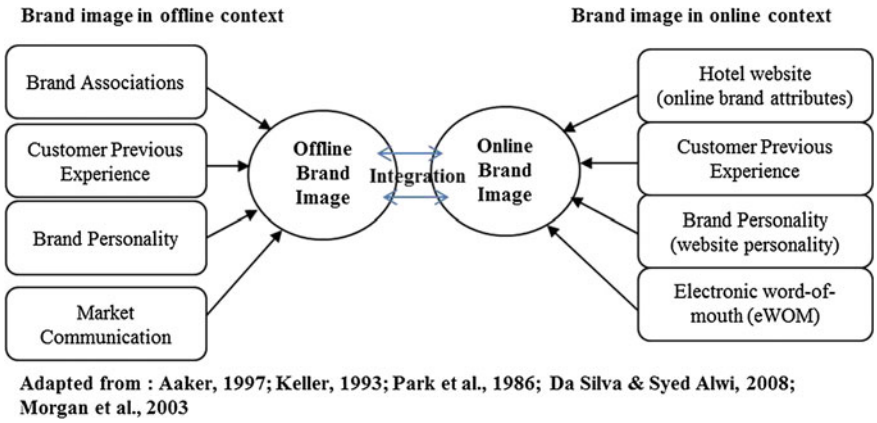

Fig. 1 A comparison of brand image models

and customer care) and website personality (where customers view the company name as a person) have been used to understand brand image (Da Silva and Syed Aiwi 2008). However, online brand image is not created solely by online brand attributes; online platforms such as electronic word-of-mouth have a significant effect on customer perceptions of hotel brands. Therefore, this study explores the dimensions of brand image in an online context from a holistic view.

2.3 A Comparison Between Brand Image and Online Brand Image

Based on Fig. 1, it is apparent that the dimensions of brand image in offline and online contexts are similar. Customers form a brand image through a synthesis of all the signals (brand associations, customer previous experience, brand personality and marketing mix activities) communicated by the brand (Keller 1993; Biel 1992). There has been little previous research about online brand image formation from a holistic point of view, so this study presumes that hotel websites and online travel agency (OTA) websites (online brand attributes), customers' previous experience, brand personality (website personality) and electronic word-of-mouth all contribute to forming online brand image (Coupland et al. 2003; Da Silva and Syed Aiwi 2008; Christodoulides et al. 2006).

The seamless integration and co-operation between the two channels is essential because it helps to enhance the customer experience, strengthens the brand image of companies and cultivates customer loyalty in both channels (Kwon and Lennon 2009). The unsatisfactory performance of a company in one channel may impact the customer's image and expectations of the company in the other channel (Kwon and Lennon 2009).

2.4 Online Brand Image and Herzberg's Two-Factor Theory (1959)

Da Silva and Syed Aiwi (2008) suggest that customers may follow a hierarchical sequence when they assess a brand. The customer may start with the rational (or functional) value first then progress to a higher level, the emotional value (Christodoulides and de Chernatony 2004). This concurs with Park et al.'s (1986) view that brand benefits are similar in terms of how the lower-level needs should be satisfied first before leading to higher-level ones.

In a similar view, Herzberg's two-factor theory (1959) explains that there are a number of factors in the workplace that might bring about satisfaction (motivation factors) such as achievement and growth, but that the factors that make people satisfied at work might not be the same things that make them dissatisfied (hygiene factors) such as working conditions. Herzberg et al. (1959), and Park et al.'s (1986) theories deal with human motivation and needs and what is required to meet those needs. This paper suggests that these theories can be applied to the brand benefits underlying how products and services can satisfy customers' needs. Furthermore, these theories suggest that customers may assess the functional factors (physical needs, extrinsic motivation) before moving on to the symbolic level of the brand (psychological needs, intrinsic motivation).

In an online context such as "navigation", "ease of use", "security", "site appearance" and "speed of download" refer to the functional (or the cognitive evaluation) of the brand (Christodoulides and de Chernatony 2004; Da Silva and Syed Aiwi 2008). The emotional values are represented by the metaphor of personality traits and this assumption is consistent with other previous studies (Davies et al. 2004). Further explanation of the relationship between brand image theory and Herzberg's motivation-hygiene theory (1959) can be seen, for example, when customers may rationally assess a hotel website (such as finding hotel information and booking a room). Their online brand experience would then lead to the customer progressing from a lower stage to a higher stage of the brand benefit hierarchy. This means some online brand attributes (such as ease of use, content) can achieve customer functional benefits but may not be able to build emotional benefit (see in Fig. 2). This in turn will not necessarily lead to a positive online brand image, customer satisfaction and loyalty. Following Herzberg's motivation-hygiene theory in relation to brand image, it could explain that the things (online brand attributes) that give customers functional benefit and allow them to book the hotel might not increase their positive brand image, while some online brand attributes (brand personality) that can achieve symbolic and experiential needs might only lead to positive brand image once their functional needs are met. Figure 2 shows how Herzberg's Two Factor Theory (1959), and brand image theory in relation to online brand image can be combined.

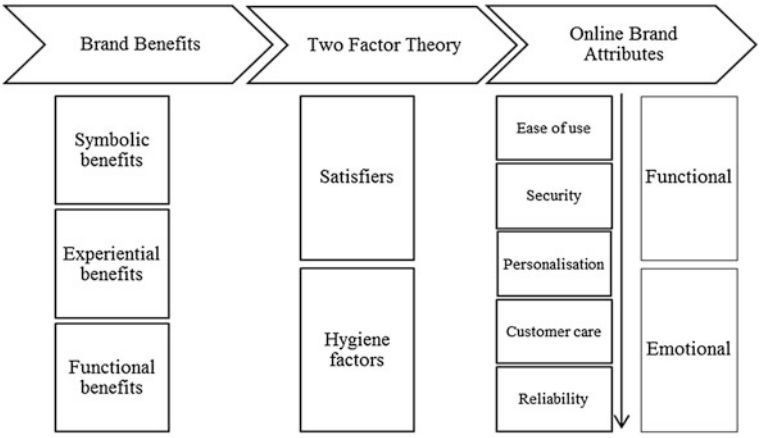

Fig. 2 Herzberg's two factor theory in relation to online brand image (*Source* Adapted from Christodoulides and de Chernatony 2004; Da Silva and Syed Aiwi 2008; Herzberg et al. 1959)

3 Methodology

This study aims to examine the construct of online brand image as applicable to the hotel business. It is an exploratory study as a means of finding out 'what are the online brand attributes that determine online brand image'. A qualitative approach was adopted to gain deep understanding from hotel marketing managers and hotel customers. The two-phase data collection included a first phase of semi-structured in-depth interviews with nine marketing managers from nine-branded hotels representing both corporate and unit levels to explore the topic from both strategic and operational perspectives. The interviews were conducted in UK and in Thailand because of access to branded hotel managers. All participants were responsible for managing their brands and communicating them to customers so they were eligible to respond to the research questions. Considering that this is a preliminary study, the sample size was considered appropriate.

The second phase involved a three-step procedure with nineteen hotel customers in the UK starting with semi-structured interviews, followed by an online hotel booking scenario and, finally, conducting visual hotel website image testing. This experiment was aimed to investigate how hotel customer perceptions of a brand are affected by the online platform. Each of the interviews lasted on average forty-five minutes to one hour and all interviews were audio-recorded. The majority of respondents had previously booked hotels through a hotel website or online intermediary website (e.g. booking.com; hotel.com). Moreover, most participants were in full-time or part-time employment, and were not students as used in previous studies.

The study developed a deductive approach. The interview transcripts were analysed based on previous theories of brand image, and online brand image.

However, the researcher was open to discovering new themes relevant to the study. This study employed a thematic framework for analysing the collected qualitative data. The thematic analysis technique helped to classify and organize data according to key themes, concepts based from previous literature and emergent categories relevant to the research objective (Ritchie et al. 2003). This framework with both inductive and deductive approaches will help to capture all relevant themes and gain in-depth understanding of the data. To avoid researcher bias and increase the validity and credibility of the findings, peer debriefing and member checking of information was used (Creswell 2009).

4 Findings

Each section of these results provides a summary of the findings from both hotel managers and customers by giving examples of direct quotes from the interviews supported by the literature. The code M stands for participating hotel marketing managers and the code C stands for participating customers. The findings are delineated under two major themes: (4.1) online brand attributes and (4.2) online marketing communication. Specific attributes determining online brand image from both hotel marketing managers and hotel customers are shown under the following five sub-categories: (1) ease of use, (2) content, (3) structure and layout, (4) site appearance, (5) price. While (6) electronic word-of-month (eWOM), and (7) search engine optimization are the two sub-categories under online marketing communication.

4.1 Online Brand Attributes

From a managerial perspective, the findings reveal that ease of use, site appearance, content and price are seen to impact on hotel brand image, while customers perceive ease of use, site appearance, structure and layout, content, and price influencing their perception of hotel brand image online. The following sections discuss each sub-theme in detail.

(1) **Ease of use (website)**

Both managers and customers asserted that ease of use was an important attribute determining online brand image.

> Websites should be easy to use. If it takes so much time for customers to navigate online, they will feel upset about it and it will impact on our hotel brand image (M2).
>
> I don't think there is an excuse for having a poor website. Don't make it too hard to get somewhere; don't make me go to a lot of screens. If I want to go to page 3, I should get that quickly (C2).

The above quotes highlighted the importance of ease of use from both hotel managers' and customers' perspectives. The concept of ease of use has been discussed by many researchers (Palmer 2002; Song and Zahedi 2005). Most of them related it to website design and website quality which influences purchase intention. However, the findings further partly substantiated the few studies which reported ease of use also determining positive online brand image for service industries (Da Silva and Syed Aiwi 2008). The above quotes illustrated that if a hotel website is not easy to use, it will dilute the hotel's brand image but it does not strongly confirm that it will influence positive online brand image.

(2) **Site-appearance (website)**

Most participants mentioned that site appearance was a significant online attribute which impacts on customers' perception.

> When it comes to your visuals, it affects your image and your brand. You need to make sure that you are on top of everything, because every single touch point can affect your brand perception(M4).
>
> The colour on the website is purple which coordinates with the brand image that we can see everywhere. Every time I think of this brand, it is purple - even inside the room, it has been decorated in purple colour (C18).

The findings revealed that site appearance did not only influence customers' intention to shop online, but it also influenced customers' attitudes towards hotel brand image from both the managers' and customers' perspectives. Managers' comments showed that they use quality and good image to attract customers, while customers prefer to see consistent image, and colours that represent the hotel brand. The results corroborated previous studies that the site should be visually attractive on-screen which influences customers' attitude towards the online shopping experience (Santos 2003; Venkatesh and Agarwal 2006). Moreover, the hotel should provide a consistent brand experience across all customer touch points both online and offline in order to sustain hotel brand image.

(3) **Content (on the Internet)**

All hotel marketing managers agreed that hotels should provide reliable, up-to-date descriptive information that is consistent with their brand identity. However, many customers commented that hotels do not provide enough informative content, which consequently impacts on their perception of the brand.

> We try to standardize all our visuals and content to ensure that they are much more consistent with our brand vision and brand identity (M7).
>
> For me, I want to know the dimensions of the room; I don't think they put that. This is what you got, type of deluxe room, premier room. I don't really know how they are different (C10).

The above quotes showed that some hotels failed to provide sufficient information to customers. Hence, this indicates that insufficient information might impact on customer perception of a hotel brand but does not confirm that adequate content will lead to positive online brand image. However, the findings suggest

that hotel managers realise the importance of providing standardized images and content following their hotel brand identity but fail to respond to what customers want in terms of content.

(4) **Structure and Layout (website)**

Structure and layout concepts had been mentioned only by hotel customers. Many participants expressed their interest in the structure and layout of the website; this was shown by the following remarks:

> I can see that image because it's consistent; you are bombarded with it; the hotel could draw the logo because it's a consistent sort of image. When you look at the page, it's not even the words, it's not even anything else; it is a kind of picture, layout page, colour that use to present its corporate message every page, you get a certain feel to it (C8).
>
> This website has a white background; it does not provide any information on the first page, and you need to flip to the next page. This looks like an upper-class hotel, something which is quite elegant (C4).

The findings corroborated previous studies that a website should have a consistent layout, good use of frames and the company logo present on each page to enhance branding (Santos 2003). It further revealed that the structure, layout and pictures on a website impact on the customers' perception of a hotel.

(5) **Price (website)**

Price is an important attribute because customers often associate price with the value and quality of the brand. The following remarks show how price impacts on perceptions of hotel brands, from both hotel managers' and customers' views:

> We use Expedia and we offer a promotional price; yes it dilutes our brand image but unfortunately for us the strength of the brand with Expedia is quite a bit stronger than using internal communication. I agree that it dilutes our brand and it takes people away but in another way it allows you to be found (M1).
>
> Really, this brand (hotel A), I am quite surprised as actually I would expect it to be more expensive. Maybe they don't want to appeal so much up-market. It's interesting as well; you've got here rooms from £69 but actually I would not associate that price with this (hotel A). I would expect you would pay more than £100 for staying in it (C19).

As illustrated by the above quotes, it shows that online travel agencies (OTA) are taking control of hotel distribution and consequently impact the perceptions of a hotel brand in the customers' minds. Price may dilute brand value and customers' positive beliefs about hotel brands because customers often associate low price with low quality. The findings supported previous studies that show that price is correlated with perceived quality, with a consequent effect brand image (Cretu and Brodie 2007).

4.2 Online Marketing Communication

Online marketing, also known as internet marketing, web marketing, or e-marketing, can be defined as the marketing of a product or service over the Internet (Gay et al. 2007). Both hotel marketing managers and customers agree that search engine optimization and electronic word-of-mouth (eWOM) influence their perceptions of hotel brand image online. The following section discusses these two themes in detail.

(6) **Search Engine Optimization (on the whole online platform)**

Both hotel marketing managers and customers claimed that search engine optimization helps to create brand awareness and brand visibility. Some participants claimed that the hotels listed on the first three pages in search engine results are up-to-date, reliable and more credible. The following statement exemplified the importance of search engine optimization:

> The Internet can make us more visible; you need to make sure that you are well presented in the internet; … how you are found in the internet through SEO is very important. It is critical because people do not actually look through to page 2, 3, and 4 of their search. They will not look any further from the first page (M6).
>
> When I search for a hotel, I will use Google and I believe that first three pages on the search engine are up-to-date and reliable (C15).

From the above, participants' brand information was developed from search engine optimization. Search engine interfaces contain branding elements, such as symbols, logos and names, so search engines can be seen as one of the intangible attributes of a brand (Jansen et al. 2007). Hence, the finding further support previous studies that search engine optimization not only helps to increase brand visibility but also influences customer perceptions of a hotel brand when they believe that the first few hotels that come up on the first search engine results page are good hotels.

(7) **Electronic word-of-mouth (on the whole online platform)**

As previously mentioned, the expansion of the Internet provide customers with the ability to gather product information from other customers' comments posted on the internet and offer their own consumption-related advice by engaging in electronic word-of-mouth (Hennig-Thurau et al. 2004). Nowadays brand information is widely spread and discussed in different forms such as blogs and online forums.

> Online reviews impact our brand image, which is quite difficult to handle. Where's the reliability and credibility of information? Customers see different comments from different websites and they can compare. We have built long term offline brand image so online negative comment might impact a bit (M1)
>
> I think customer review is very important to me; sometimes a brand is big but the customer review is poor. The comment said "the room is too old, even though it's big chain hotel; I just really don't want to stay there (C2).

The findings supported the previous studies that product information in online forums has greater credibility and relevance and is more likely to create empathy and emotional involvement with consumers than information on marketer-designed websites (Bickart and Schindler 2001; Ye et al. 2009). O'Connor (2010) suggests that the guest experience is becoming essentially transparent, that reviews are highly influential on customer decision making. However, this study also indicated that the transparency of hotel brand information does not only impact on customer purchase decisions but it also creates an effect on customers' perception of a brand. This study suggested the importance for hotel marketing managers of being able to respond to customers' reviews, and the need to be more proactive, continuously engaging in dialogue with customer, to protect and enhance their brand image (O'Connor 2010).

4.3 Assigning All Categories to Herzberg's Two-Factor Theory (1959)

By assigning all categories based on Herzberg's two-factor theory (1959) and the literature on brand image as previously discussed in Sect. 2.4, the results from both hotel managers and customers interviews show that ease of use, content, structure and layout and search engine optimization are hygiene factors that impact on customer perceptions but do not appear to influence positive online brand image. These online brand attributes can achieve customer functional benefits but not appear to be able to build emotional benefits which consequently will not shape positive online brand image. The results corroborate prior studies suggesting that navigation, ease of use and content are hygiene factors. The study further suggest that structure and layout and search engine optimization can be seen as hygiene factors that impact on customer perception but do not strongly influence positive brand image. The results clearly showed, however, that site appearance and electronic word-of-mouth can be considered as motivational factors. Zhang and von Dran (2000) identified that enjoyment, cognitive outcome and credibility are motivational factors that influence website satisfiers. This finding revealed that both categories (site appearance and electronic word-of-mouth) impact customer perception and determine online positive brand image from both the managers' and customers' perspectives. Site appearance and website can be seen as antecedents that influence enjoyment, cognitive outcome and credibility. Price appears to have both a positive and negative effect from both the manager and customer view; this further contributes to the results from previous research. Figure 3 summarises the interview findings in relation to Herzberg's two-factor theory (1959).

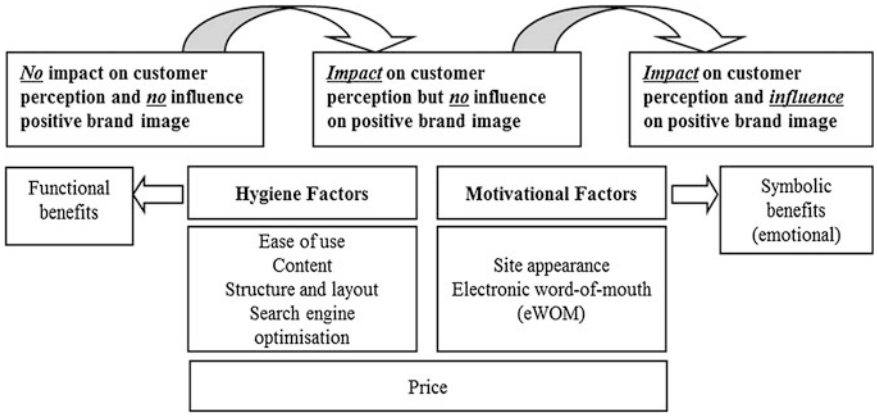

Fig. 3 Summary of the findings in relation to Herzberg's two-factor theory (1959)

5 Conclusion and Implications

In summary, the results from this two-phase study show the similarities and differences of online brand attributes from hotel marketing managers' and hotel customers' viewpoints. Both managers and customers claimed that ease of use, content, site appearance, price, search engine optimization and electronic word-of-mouth (eWOM) impact their perception of a hotel brand. Structure and layout are not mentioned by hotel marketing managers but are noted by hotel customers. Moreover, the findings reveal that there is a relationship between brand image theory and Herzberg's two-factor theory when customers may rationally assess a hotel website. Ease of use, content, structure and layout, and search engine optimization are considered as hygiene factors that impact on customer perception but do not firmly determine positive online brand image. In contrast, site appearance and electronic word-of-mouth appear to have positive motivational effects, while price appears to affect both. These results partly support the previous study of Da Silva and Syed Aiwi (2008) who claimed that ease of use, personalization, security and customer care significantly influence corporate brand image. However, this is only the preliminary stage of a larger study, where quantitative validation studies will be conducted to provide further evidence.

5.1 Theoretical Implications

While previous studies have emphasized the role of satisfaction on job motivation, very few studies have considered the relevance of Herzberg's two-factor theory (1959) to website design. This study supports new theoretical knowledge to clearly identify and distinguish between the hygiene and motivator factors that impact on

customer online brand experience. This study demonstrates the need for a thorough theoretical understanding of brand image for long-term business success. The semi-structured interview findings revealed seven sub-themes of online brand attributes and online marketing communication [e.g. (1) ease of use, (2) content (3) structure and layout, (4) site appearance, (5) price and (6) search engine optimization, and (7) electronic word-of-month (eWOM)] that impact on customer perceptions when they navigate online but only site appearance, price and electronic word-of-mouth (eWOM) would appear to influence positive online brand. The results further illustrate that ease of use, structure and layout, site appearance, price are website related attributes, while content, search engine optimization and electronic word-of-mouth are categories that need to be considered across the whole online platform, as they consequently boost positive online brand image for hotel businesses. Moreover, this study supports, as previous studies suggest, the importance of adopting both functional and emotional brand characterization in the online context as online brand attributes are used to present these two types of brand benefits (Da Silva and Syed Aiwi 2008).

5.2 Managerial Implications

The proposed conceptual online brand image model is useful to identify which attributes (site appearance, electronic word-of-mouth and price) hotels need to address in order to increase positive hotel brand image. It reveals variations in brand image formation between the offline and online context from both hotel managers' and customers' perspectives. For hotels, projected brand identity is essential but managers should understand how the customers perceive their brand in both the offline and online context. Closing the gap between brand identity and brand image is still important by integrating both online and offline marketing communication.

It is essential to understand the contributing factors that influence hotel customers' perceptions. Hotels first need to minimize hotel dissatisfaction on website performance by providing the hygiene factors while being aware that these factors are not sufficient to boost positive hotel brand image. This study suggests that the online brand attributes that impact on customer perceptions are (1) ease of use, (2) content (3) structure and layout, and (4) search engine optimization. The hotel should execute these website elements effectively because if they are not performing well, it causes customer dissatisfaction. Moreover, in order to create competitive advantage, hotels need to emphasize the motivational factors (5) site appearance, (6) price information and (7) electronic word-of-month (eWOM) effectively because they not only determine positive online brand image for the hospitality industry but also add cognitive value, affective value, and satisfaction for long-term business success.

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Part IX
ICT Adoption

Listening to CEOs: A New Perspective to Study Technology Adoption in Hotels

Sofia Reino, Carlos Lamsfus, Hugo Salas, Ortzi Torices and Aurkene Alzua-Sorzabal

Abstract Information and communication technology (ICT) continues to change the nature of contemporary tourism. ICT is particularly relevant to the hospitality industry, since it is regarded a main source of competitive advantage. Yet, reports published recently reveal that tourism is behind in technology adoption than other industrial sectors. Some works have analysed technology adoption in tourism. However, most come from other fields and the few examples relating the tourism sector are outdated. Thus, it is necessary to identify the reasons why technology adoption remains low in hotels and to find out the drivers of technology adoption in this sector. This paper analyses the data gathered from interviews and focus groups carried out with hoteliers. This phenomenological approach provided evidence on the problems with current technology, discovered some barriers and drivers of technology adoption and identified some ICT priorities.

Keywords Technology adoption · Technology evaluation · Hotels · Research paradigm

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1 Introduction

Despite the relevance of ICT to the tourism industry, and in particular to hospitality, its level of adoption of certain types of technology remains relatively low (e.g. Leung and Law 2012; Reino et al. 2013). As an example, only 74 % of the Italian establishments (ISTAT 2012) have online booking facilities. Although higher levels of adoption may be found in other European countries, studies looking at the tourism industry as a whole suggest very low levels of penetration. This is the case of the study by PhoCusWright (2011), which shows that the European online travel market only has a penetration of 36 %, and according to Giannakouris and Smihily (2011) less than 13 % of the tourism industry's turnover appears to be generated online.

However, very surprisingly, research exploring the reasons behind these low levels of adoption and the ICT requirements of the hotel industry is limited. Most of this research is outdated and may not be relevant anymore. Current research tends to follow a positivist approach to test the applicability of previous research on general ICT adoption literature, but they do this by considering only a restricted section of the literature. This approach may imply issues of ecology validity and/or lacking collectively exhaustive results.

Therefore, the objective of this study is to get an insight into the barriers and drivers of ICT adoption in hotels and their ICT priorities. It will do this by examining extant research on the drivers and barriers of adoption and theories of technology adoption through the literature and undertaking interviews and focus groups with CEOs.

2 Literature Review

The literature review is structured in two sections. One examines extant research on the drivers, barriers of adoption and ICT requirements. The other one undertakes a review of the theories on Technology Adoption, together with a critical examination of their use for researching ICT adoption in hotels.

2.1 Drivers, Barriers of Adoption and ICT Requirements

Many of the studies which specifically examined this topic in the hotel industry are outdated. This is the case of the work by David et al. (1996) who studied the views that hotels′ chief financial officers had on computer applications. Their findings suggested that front office applications were considered to have a large impact on productivity while back-office systems would have less effect. Quite outdated is also the work by Baker et al. (1999) about the productivity paradox in the industry.

Similarly, it has been 13 years since Siguaw et al. (2000) undertook a research throughout the US accommodation industry and suggested that back-office systems did not provide enough in the way of management tools to enhance managers′ strategic planning and marketing decisions but no further insight into what could be done to overcome these issues was provided by their work. Furthermore, these studies are mainly quantitative; therefore, they do not provide an in-depth insight into the topic.

Ham et al. (2005) look at the effect of adopting technology rather than to the drivers and barriers of adoption. This is also the case of Chathoth (2007), who showed the value of implementing IT for full-service hotels to improve service and to increase employee morale. The work by Cobanoglu et al. (2006), blames IT managers′ limited education on IT as one of the issues impacting on low adoption, but this is their assumption rather than findings from their study.

Current studies looking at the determinants of adoption tend to follow a positivist approach, which narrows down the scope of their findings to what was suggested by extant research, mainly undertaken in other sectors and years ago. This is the case of the work by Hashim et al. (2006), which takes this positivist approach and focuses only on organisational factors to study the stages of internet adoption in Malaysian hotels. It is also the case by Schegg et al. (2007), which tests the influence of a restricted set of pre-established organisational factors on technology adoption. This is also the approach taken by Fuchs et al. (2009), Leung and Law (2012) and Wang and Qualls (2007) which consider technology adoption theories to develop and test models of ICT adoption in hotels. A few exceptions to this positivist approach in current research exist though. One of them is the work by O'Connor (2008), who examined problems to adopt technology among European hotels. However, he did this by interviewing European chief information officers rather than hotel managers. Therefore, their view may be biased towards prioritizing the need to adopt technology. Another example is the work by Law and Jogaratnam (2005), who undertook a similar study among hotels in Hong Kong. They combined the interviews with IT managers with some interviews to hotel managers and examined technology priorities in terms of the technology that they already have in place. However, they do not explore any further needs or the drivers/barriers of adoption.

In tourism research there are only a few studies examining this issue. The work by Duffy (2006) within the tourism industry identified issues related to security concerns, lack of ICT applications for micro and small tourism enterprises, design, maintenance and integration of old/new systems. Boffa and Succurro (2012) identify the effectiveness, flexibility of ICT, their wide distribution and use in a coordinated way as essential drivers of adoption. Reino et al. (2013) identified additional barriers, such as the lack of standardized data for ICT-based collaboration with intermediaries and the limited capabilities of some systems. However, these studies tend to focus on the adoption of specific technology only.

There is further research in other sectors. Rehman et al. (2006) looked at technology adoption among farmers, and identified cost effectiveness and expectation of improved results as essential drivers of adoption. Windrum and

De Berranger (2003) looked at general business contexts to identify some important barriers to adoption. This includes lack of access to the required technology, and distant to its distributor.

Additional research in general business environments identified business-related characteristics acting as barriers and drivers of adoption. These are sector/supply chain characteristics, in terms of the technology intensiveness of sectors and the supply chain influence; and organisational action, including age of management and experience (Palvia and Palvia 1999); gender of the managers (Igbaria et al. 1998); management knowledge of ICT (Nambisan and Wang 2000), and management ability to communicate with IT managers (Burgess 2000), management approach to ICT, organisational structure and ICT adoption strategies and business strategy (Miles et al. 1978); and business endogenous characteristics, including size and business age (Arvanitis and Stern 2001), rate category, corporate status, affiliation and geographical location (Windrum and De Berranger 2003). Also within general business environments, Kuan and Chau (2001) differentiate between internal (i.e. organizational factors, perceived benefits and organizational readiness) and external pressure (i.e. pressure from stakeholders) when identifying drivers of adoption. Watkins (2000) in Leung and Law (2012), suggests that many hotel managers hesitate to make such an investment in technology because their return on investment is often difficult to measure.

SMEs, among which most hospitality organisations are, have been specific focus of attention to some studies on this topic. This is the case of the work by Iacovou et al. (1995), who suggested that the pressure made by partners, customers, the media, or competitors have been identified as key drivers of adoption among SMEs. McGregor (1996) suggest that small businesses tend to avoid ICT into their business if they see it as complex to use. And Reynolds et al. (1994) advocate that small businesses generally lack training, and technical knowledge. Furthermore, Griffin (2004) argues that they lack the ability to integrate technology into the business strategy.

2.2 Technology Adoption Theories

According to Venkatesh et al. (2003) there are two different types of research developing theories of technology adoption: those studies looking at the organizational readiness to embrace technology; and those which focus on the individual acceptance of technology.

Organisational Readiness Examples of studies looking at organisational readiness to adopt technology are the work by Nolan (1979), who suggested a framework for the assessment of technology in business environments, consisting of six stages of technology implementation. The six-phase model developed by Cooper and Zmud (1990) consists of similar stages. However, the work by Kwon and Zmud (1987) considers factors beyond those intrinsic to the organisations. They

develop a five-item framework for assessing the ability to adopt ICT based on five factors that may affect any of the six stages of ICT implementation.

Individual Technology Acceptance Most theories of adoption focus on the attitude of the individual towards the technology as a predictor of adoption. This is the case of the Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1980), which considers the *attitude toward behaviour* and the *subjective norm* (related to the influences from the social context). The Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Theory of Planned Behaviour (TPB) are variations of the TRA. TAM embraces a similar approach and replaces TRA's attitude measures with *perceived ease of use*, and *perceived usefulness* (Davis 1989). However, it keeps the core construct of *subjective norm* which had been included in the TRA. UTAUT aims to integrate the competing user acceptance models and follows a similar approach (Venkatesh et al. 2003). TPB also focuses on attitude and individual perception (Ajzen 1991). It conceptualizes adoption as the result of *attitude toward behavior*, *the subjective norm* and *the perceived behavioral control* (i.e. perceived ease or difficulty of performing the behavior). Similarly, the Social Cognitive Theory (SCT) focuses on personal attitude, motivation and additional individual factors as predictors of technology adoption. This theory was based on Bandura′s (1986) theory of human behavior, and applied to the context of computer interaction by Compeau et al. (1999).

Overall, the studies on ICT adoption of the hotel industry tend to neglect this factor of innovation. Hashim et al. (2006), and Schegg et al. (2007), focus on organisational factors only and pay no attention to the characteristics of the innovations. Others do consider the innovation itself but they subordinate these characteristics to organisational contexts. This is the case of the work by Fuchs et al. (2009) which considers a wide array of technology adoption theories, including those related to organisational readiness (i.e. Tornatzky and Klein 1982) and individual technology acceptance (i.e. Davis 1989; Rogers 1995) to develop a model of eBusiness readiness evaluation for hotels. However, the elements of the individual technology acceptance models become integrated in the model as part of the organisational (i.e. "perceived cost" and "perceived success") and the environmental factors (i.e. "perceived competiveness"). This is also the case of the work by Wang and Qualls (2007). These authors expand the TAM to explain ICT adoption in hospitality, and interestingly, they take into consideration the characteristics of the innovation. However they align with Davis (1989) on the subjective nature of the innovation characteristics. Even those studies which make reference to elements of technology adoption theories at the individual level consider this by making a differentiation between perception and the actual characteristics of technology. This is the case of Leung and Law (2012).

Disregarding the influence that the *characteristics of the innovations* themselves have on their own adoption or justifying their perception only on the basis of organisational factors has important implications. These relate to the type of

recommendations arising, which will always be directed to highlight the need of developing the ICT skills and awareness of the hotel industry while no recommendations will be directed to other actors, i.e. ICT and policy developers.

3 Methodology

A phenomenological approach was found most appropriate due to the aim of this study. This type of approach is focused on exploring the views of the actors in a given situation (Lester 1999). The study consisted of a series of interviews with the management of three hotels, together with a focus group involving 3 hoteliers and the director of an association of hoteliers. Focus groups are very suitable for phenomenological studies like this, where the attitudes, beliefs and emotions about a specific issue are being explored (Gilbert 1997). The focus groups were complemented with interviews on an attempt of triangulation, i.e. to validate the results by providing at least two different types of data (Flick 2004).

The data collection took place between May 2012 and May 2013. Both the interviews and the focus group sessions were semi-structured. Aiming to collect in-detail and exhaustive information about their ICT priorities, participants were encouraged to suggest technologies that would be most helpful to address issues that they face every day. The following hospitality-related topics were used to encourage this participation: intermediation; check-in and check-out, seasonality, occupation levels, customer loyalty development, competitiveness and guest experience. The ICT priorities, together with the additional topics of social media, Property Management System (PMS), Guests′ Entertainment Systems and online presence, which were added by the researcher, gave structure to the identification of drivers and barriers to adoption. The resulting data was coded using content analysis to identify major themes. The choice of establishments was based on a combination of the diversity sought for representing potential differences (i.e. different size, affiliation, star rating and geographical location), together with a convenience factor (i.e. there is an ongoing collaboration of these establishments with the research centre undertaking the research). All the establishments were located in Spain.

With regards to the interviews, these were undertaken at three establishments of the same hotel chain. The three establishments belong to the high end star rating, including a 4 star and two 5 star hotels. However, the establishments are located in different geographical areas. From now on in the document, these will be referred to as hotel 1, hotel 2 and hotel 3. They are all city hotels, but located in different tourism destinations. Hotel 1 is located in the city of San Sebastian, a coastal destination, which is a regional capital, but of a small size. The hotel serves a combination of leisure and business visitors. Hotel 2 is located in Bilbao, also a regional capital city, but of a larger size and an important business hub which goes beyond the region of which is capital. This one is not at the coast but counts with relevant tourism resources, mainly cultural. This hotel serves a combination of

business and leisure visitors. Hotel 3 is based in Madrid, the national capital, and mainly counts with business visitors. Aiming to obtain an in-depth understanding of the issue under study, managers of different departments were interviewed. In hotel 1, the interview was undertaken to the General Director, the Operational Manager, the Receptionist Manager and the Quality Control Manager. In hotel 2, the General Director, the Receptionist Manager and the Lodging Director participate. Finally, in hotel 3 the interview could only be undertaken to the General Manager due to availability issues.

The focus group counted with representation from three different hotels as well as a regional hotel trading association, all based in San Sebastian. All were represented by their General Managers. The hotels were of varied ratings. Hotel 4 has 3 stars and is a small establishment counting with 40 bedrooms. Hotel 5 has 4 stars and is of a larger size, counting with 120 bedrooms. Finally, hotel 6 has 1 star and 11 bedrooms only. They were all located in the same city and similarly served a combination of leisure and business guests. Additionally, it should be noted that, in contrast to the establishments participating on the interviews, the three hotels involved on the focus groups are independently owned. Therefore, the establishments participating in the interviews and focus groups, all together, represent the diversity of the hotel sector.

4 Findings

4.1 Problems with Current Technology

The participants suggested a number of issues related to the technology that they currently have in place. These included problems of speed and flaws related to the design of processes. Additionally, they also suggest that suppliers offer limited customer service support, in terms of training and/or a system for collecting feedback.

With regards to the poor design of processes, two of the hotels reported important issues related to their PMS, which is a key ICT system in hotels. Hotel 6 suggested that their PMS does not fulfil their requirements. Therefore, they had to adopt back Excel as the supporting system for managing their stock, which surprisingly suits their needs better. Problems related to the poor design of PMS processes were also mentioned by hotel 1. When they need to cancel a bill they have to go through the entire process of cancelling the previous bill and issuing a new one. This could be easily sorted out by re-resign the process as outlined in the software. These findings highlight the relevance that the characteristics of the innovation have on their own adoption, as advocated by Rogers (1995).

With regards to the problems of speed of the PMS, these were reported by hotel 1 only. Apparently, the system was slow and the overall process of checking in and out takes too long with the consequent dissatisfaction of clients. This implies that

staff cannot concentrate on giving good service to customers because they are too concentrated on managing the technology. Hotel 6 had adopted their PMS from a small supplier, whose limited penetration in the market could be linked to the low quality of their products, this could explain the problems encountered with this system. However, hotel 1 had opted for a major provider when acquiring their PMS, which was the same adopted by hotel chains like Holiday Inn.

All the hotels participating in the study agreed that it is very hard to get their views hear by technology developers. This expands the suggestions made by Leung and Law (2012) by which the hotel industry does not know how to communicate with the ICT sector, but suggesting that ICT developers share the blame for this poor communication. The hotels participating on the focus group (i.e. hotel 4, hotel 5 and hotel 6) all agreed that they had to join forces in order to get their views heard by ICT developers. Apparently, this did not seem to be an economic issue. Hotel 5 explained that they offered additional payment and this had made no difference to the attention paid to their requests.

The characteristics of the supply chain and in particular the pressure made by players of the marketplace, was also commented as a very important aspect. Furthermore, the results expand on this issue suggesting that some technological aspects are used to lock up markets. This is the case of connectivity of distribution systems and was clearly outlined by hotel 1. The choice of PMS made by this hotel was not based on the expected quality of the system, but on the direct connectivity of this system to main distributors in the market.

Furthermore, according to hotel 1 training on the use of the system is also an issue. The Operational Manager of this hotel explained that the training given by the PMS providers does not enable staff to go through the detail of the different capabilities that the software may offer. This expands the views of previous research which had suggested lack of training was a major issue (Leung and Law 2012). The current findings suggest that it is a problem of lacking system-related specific training rather than an issue of general ICT education.

4.2 Drivers and Barriers of Adoption

Issues related to the size of establishments and lack of affiliation to a chain, suggested by previous studies as potential barriers to adoption (Arvanitis and Stern 2001; Schegg et al. 2007), were brought up during the focus group. The reason behind this influence is partly related to the more limited resources of small and independently owned hotels. For example, a chain can face a level of expenditure for the adoption of a PMS system that independent establishments may not be able to embrace.

However, differences in the level of adoption presented by establishments of diverse conditions do not seem to be related only to the influence that size and affiliation make on the availability of resources. Size and affiliation, together with other characteristics of establishments, such as the type of service that they offer

(e.g. a combination of bedrooms and apartments which are offered by hotel 6) imply that different ICT solutions are needed, or that these should be more flexible. This suggestion aligns with and expands those made by extant research which highlighted the relevance of flexibility (Boffa and Succurro 2012). Therefore, solutions need to target well businesses by paying attention to their different characteristics and needs.

Participants understood the need to invest on technology. This was reflected by the suggestions made with regards to intermediation. It is true that hotel 1, hotel 2 and hotel 3 considered that this cost was disproportionate to the benefit that they obtained; however focus group participants did not think the same way. According to these establishments, costs of intermediation were considered part of the nature of the business. Participants commented the benefit brought in by websites like booking.com which can reach potential customers anywhere in the world despite their language. Customers from China, Japan and other parts of the world would not be reachable for these hotels if they had to rely on the translation of their own website to different languages. Different opinions with regards to the value brought in by specific intermediators could relate to variations on the cost or benefit that they obtain from them. However, it shows that in principle, there is an understanding that technology investment is required.

As suggested by Leung and Law (2012) an important barrier to adoption is the poor communication between the ICT and hotel industries, and this clearly impacts on technology adoption. However the results show a different vantage to consider this problem. All the focus group participants suggested that they encounter difficulties prioritizing adoption on the basis of cost-benefit. Guidelines to prioritise on these bases are scarce, and since technology becomes obsolete very soon this cost-benefit relationship becomes even more relevant when making decisions about ICT adoption than when considering other types of investments. However, it also suggests that developers do not speak on these terms.

Finally, it is worth mentioned that these findings highlighted the influence of hotel manager′s perception of technology as a determinant of adoption, suggesting the applicability of Individual Technology Acceptance, (e.g. TRA, TAM, UTAUT, TPB and others mentioned in the literature review), to understand the phenomenon of technology adoption in hotels.

4.3 ICT Priorities

ICT priorities identified by hoteliers relate to PMS, together with that technology facilitating the communication with consumers (face to face and/or through ICT-enabled channels), that one providing clear added value to the customer directly (e.g. Internet access) and the one helping businesses knowing their customers.

Communication with Customers Hotel 1 identified as one of the priorities for technology adoption systems which facilitate a holistic communication with

consumers, enabling the collection of feedback at any time and in multiple locations (especially in areas where it is very likely that customers have to wait, e.g. lifts). Participants in the focus group suggested that the more channels are open the better, to ensure that the one which is preferred by your customer is in place. As an example, hotel 5 suggested that some cultures are more reluctant to make a complaint face to face, and this is why having online systems that collect feedback during the stay becomes so valuable. An additional example suggested by hotel 6 is to use Whatsapp[1] to facilitate their communication with foreign customers.

Supporting communication with consumers does not necessarily relate only to the adoption of technology, but also to potential changes to the business processes. An example of this are the suggestions made by hotel 2 and hotel 3, who commented that they would like to change their check-in model from the traditional one to one without physical barrier. The way they envision this is by greeting customers at the door, accompanying them to a seat and checking them in via a tablet. Hotel 2 also wants technology to support upselling. These two are a combination of technological and logistic developments. It implies that both hotels and ICT developers would need to work very closely together to ensure that technology fits in well in the overall business process.

Despite the fact that only a small proportion of their bookings came from their own website, focus group participants highlighted the importance of having a good website, not only for distribution but also as a presentation to potential customers who may want to investigate further before booking through third party sellers.

Added Value Hotel 1, together with those hotels participating on the focus group suggested that technology should enable hotels to provide added value to support them improving their experience of the hotel and of the destination. Examples of how this could be done relate to providing guests with direct access to information regarding additional service in the hotel, through systems that enable them to book them directly, and to know about their availability. Ideas such as sensors which enable guests to know the level of availability of gym, spa or restaurant, together with the possibility of booking a session directly were suggested as of great value. With regards to technology which could help customers enhancing their experience of the destination, recommendation systems were suggested as of great value. This could also be used as a strategy to encourage customers to extend their stay. It was suggested that hotels could add their own recommendations or establish their very own rules to provide distinctive recommendations.

Flexible and Pull CRM, Integrated to PMS All the participants (both on the interviews and on the focus group) suggested that adopting technology that enables them to know their customer and undertake segmentation based on behavioral information is a priority. Those establishments participating on the focus group argued that a customer database with information about their preferences could be highly relevant. The hotels participating in the study suggested that they do not

[1] http://www.whatsapp.com/about/

have information about their customer′s profile (including demographic and behavioral information), their personal preferences (e.g. whether they prefer towels of a specific color or if they require a bath instead of shower, wine, fruit or water as a welcome present, etc.). This would allow them to offer a real personalization of services to the customer; to focus on reaching and building loyalty with the type of customer that they want and focusing on the elements that are relevant to this type of customer; to undertake segmentation with regards to the type of activity that they offer. In terms of how much technology to provide customers for their own use, this question was again related to the type of customer target by the hotel, and how keen this customer is to adopt technology. Proactive technology that can capture information about customers′ behavior to help completing profiles would also contribute extensively.

Social Media Different issues related to this technology were highlighted. First of all, all the participants suggested that they need guidelines to manage reputation management, systems summarizing the information are not enough. For example, Hotel 1 suggested that they use a tool to manage their online reputation in terms of helping them to understand what their position with regards to competitors is. However, in terms of really understanding what is being commented and whether measures should be taken to improve they still need to read the comments. Furthermore, decisions about how to respond are based on their own subjective considerations, and made on an ad-hoc basis. Hotel 5 made here reference again to the need to know one′s own customers. According to this hotelier this is should be a prior step to that one of managing social media. His views on this, seconded by the other participants, were that the management of social media can be very time consuming and it will be even more as time passes by and more people add their own comments. Therefore, only when one knows their customers, and what requirements they have, decisions about what comments are worth following up can be made. In the words of this hotelier "there is no point wasting your time following up on comments which are not important to your target customer".

5 Conclusions

This paper highlights the limitations of extant research on ICT adoption in hotels. It examines the theory on technology acceptance and organizational readiness to understand the concepts behind and then compares these to extant research undertaken in hotels.

Furthermore, it suggests a change of methodology, claiming for further qualitative ICT research, focused on identifying the needs of the industry and to prioritise these to advances in technology. It also suggests a change in terms of questioning some of the assumptions in current ICT research in hotels: (1) that the perception of innovation characteristics relates to the organisational difficulties to appreciate technology; and (2) that limited adoption is always related to the lack of

organizational readiness. It is also a change of paradigm in ICT development, because it has identified a hotel sector requirement about technology by which business processes should not determined by the technology, but that technology needs to be designed to support business processes.

It also suggests an agenda for policy and ICT development, by identifying the technological priorities of the industry, which relate to tools that help them knowing their customer better, technology that helps them communicate with their customer (pre-, during and post-trip), and overall technology which is flexible to suit their needs, and that brings in a clear value to the company. It highlights problems of communication with ICT developers, who fail to communicate in their terms.

A limitation of this study relates to the reduced participation, which responded to the phenomenological approach taken. Further qualitative research should be undertaken to collect data until saturation is reached. Generalisation should be subsequently sought through a survey of the industry. Furthermore, cross-country research should be undertaken to identify potential cultural differences. Additional work should be directed to develop a comprehensive framework of technology adoption in hotels, which combines both individual technology acceptance measures and organisational readiness data.

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Barriers Affecting Social Media Adoption in Finnish Tourism Businesses

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Abstract Social media has affected the ways tourism companies do business and companies have been eager to adopt it as part of their marketing strategy. However, there still exists a large number of tourism companies that completely neglect the use of social media. This study explores the reasons why some tourism companies do not adopt social media. First, tourism companies are interviewed about the reasons why they are not using social media. Second, the results from the interviews are transformed into quantitative survey on barriers to adopt social media. The results show that there are three main barriers for not using social media: no resources, concerns about social media and no need to use social media. The results also show some explanations for the differences between companies.

Keywords Social media · Technology adoption · Tourism · Barriers

1 Introduction

Today we live in an era of social media, making it possible for millions of Internet users to communicate with each other as well as with businesses in countless different ways (Leung et al. 2013). Social media have been extensively adopted by

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travellers to search, organize, share and annotate their travel stories and experiences through different social media channels (Leung et al. 2013).

Social media has been trumpeted as a "mega trend" affecting the tourism system (Xiang and Gretzel 2010). It has become a very popular topic in tourism research; making the researchers forget that there still exist companies that have chosen to neglect social media in their business operations. This group of businesses has been almost completely left outside the field of tourism research even though it can be argued that these companies are the ones in peril of lagging behind.

In the earlier literature, a large number of factors affecting technology adoption especially regarding information and communication technologies (ICTs) have been identified (Bruque and Moyano 2007). However, these have mainly focused on cases of successful adoption of ICTs, such as Fink (1998) who studied Australian Small and Medium Enterprises (SMEs). Cases where the failure of technology adoption is studied are almost non-existent, meaning that there is not much information available why some companies choose not to use a technology, especially in the field of tourism. Goode (2005) states that knowledge of the factors causing technology rejection should be as valuable as that on technology adoption.

Most of all, there is no knowledge on why some tourism businesses use social media and others do not. This is related to the diffusion of innovations (Rogers 2003): some businesses are eager to adopt new technologies whereas others are lagging behind. Facebook fan pages for example have been recognized as an effective marketing tool (Dholakia and Durham 2010). Pesonen (2011) for example has studied how Finnish tourism businesses use Facebook but focused only on companies that have already adopted Facebook as part of their marketing strategy. Tourism is regarded as a significant source of economic growth in Finland but tourism companies need support to develop and increase their competitiveness, for example by more efficient use of social media.

This study focuses on those tourism businesses that are not currently using social media and explores the reasons why they have not adopted social media. By clustering the businesses into groups based on what are the barriers affecting them not to adopt social media it is possible for Destination Marketing Organisation's (DMO's), development projects and other organizations to understand what kind of different resources and information different companies require in order to take the next step into the field of social media.

2 Background of the Study

There is extensive work done in the literature regarding the adoption of information technologies by small businesses. For example, Premkumar and Roberts (1999) studied the adoption of new information technologies in rural small businesses. In their study results based on data from 78 organizations indicate that relative advantage, top management support, organizational size, external pressure and competitive pressure are important in determining the adoption of new information technologies.

Most of the earlier literature focuses on studying technology adoption with technology adoption models such as TAM (Lee et al. 2003), TAM2 (Venkatesh and Davis 2000), and TAM3 (Venkatesh and Bala 2008). These studies aim to answer the question of why a technology has been adopted by individuals or organizations. TAM3 is the most detailed technology adoption model, consisting of several different factors such as self-efficacy, anxiety, playfulness and, perceptions of external control as well as perceived enjoyment and object usability.

Dholakia and Kshetri (2004) studied factors impacting the adoption of the Internet among SMEs in the United States. Most influencing factors were prior technology use and perceived competitive pressures. Other factors, such as firm size, had limited influence. Their results indicate that once a firm decides to own a web site, variables such as firm size, perceived competitive pressure and privacy-security, subscale of self-efficacy become less relevant for further use of the Internet.

Literature review indeed shows that why individuals or organizations adopt different technologies is well established. However, there appears to be a paucity of published empirical research on inhibitors to technology acquisition (Goode 2005). Some studies on the topic can nevertheless be found.

Goode (2005) studied why firms do not adopt open source software in Australia, even though open source software provides many benefits over commercial software. It should be noted that adopting open source is different from adopting social media but the underlying dimensions are very similar. In the literature review Goode (2005) classified reasons for not adopting technology into four categories: environmental, organisational, user and, system. Main reasons for rejecting open sources software were that they lack relevance and support. Managers could not see any benefits to using open sources software and were afraid that they would have to support open source software applications with their own resources. Also some other authors such as Damanpour (1991) and Beatty and Gordon (1988) have discussed barrier to the adoption of particular technology product, holistic analysis of technology rejection is still missing (Goode 2005).

Michaelidou et al. (2011) studied usage and barriers of social media marketing of SMEs in business-to-business context. In this context, social media is mainly used to attract new customers. Lack of perceived relevance for particular sectors was the most significant barrier to adopting social media marketing. Other barriers were uncertainty of benefits, lack of skills by the staff and major time investment required by social media marketing.

As the literature review shows, successful technology adoption cases are well known and studied. However, cases where detailed attention is paid to technology rejection or unsuccessful technology adoption are much less studied topic. This study aims to examine tourism businesses in Finland that have not yet adopted social media marketing and find out what kind of support, if any, companies need in order to start using social media. This can be achieved by using cluster analysis to form a taxonomy—an empirically based classification of businesses (Hair et al. 2010).

3 Data and Methods

Data collection was done in two parts. First 22 small and medium-sized tourism companies were interviewed by telephone about their use of eBusiness and social media, the benefits and challenges they face, or the reasons why they are not using social media. Companies were chosen based on the recommendations from a DMO in Savonlinna region. A total of 19 companies were accommodation companies, one event organizer, one restaurant and one catering company; 13 companies had less than or equal to five employees whereas nine companies had at least 6 employees. Altogether nine barriers for not using social media came up in the interviews:

- Company feels like it does not gain any benefits from using social media,
- Social media is a risk for information security,
- Not enough skills to implement social media,
- Not enough time to use social media,
- Not enough (monetary) resources,
- Company does not know how to best utilize social media in business,
- Fear for critique or negative feedback,
- Bad experiences of social media,
- Company can do well without social media.

Based on these results an online-questionnaire was structured and the most common reasons were presented in 5-point Likert scale (1 = strongly disagree and 5 = strongly agree). The questionnaire was sent to about 900 e-mail addresses comprising enterprises in the field of hospitality and tourism in eastern Finland. After two reminder messages a part of the companies were contacted by telephone and reminded to answer the survey, or interviewed by telephone. Total number of responses was 235 which contains 87 companies that are not currently using social media as part of their business strategy. Almost all the respondents were either owners or managers of the companies in question. Social media was defined as communication channels that have content produced both by companies as well as by customers. Social media was explained to be an interactive, many to many communication environment that include services such as Facebook, Twitter, blogs, YouTube and, TripAdvisor. Sample profile of the companies not using social media can be found from Table 1.

Data analysis is done in two parts. First respondents are clustered using hierarchical cluster analysis with Ward's method, a very common approach in tourism literature (Dolnicar 2002). The dendrogram suggests three cluster solutions. Cluster solutions of two, three, four and, five clusters were compared and three cluster solutions was chosen as most meaningful and easy to interpret. Also because of small sample size, smaller number of clusters makes it more reliable to compare cluster attributes. In the second part of the analysis the differences between barriers to social media use and company attributes are examined using cross tabulations and Chi square tests.

Table 1 Differences between businesses in background information

	No resources	Concerns	No need	χ^2	Sig.
Tourism is the main business				10.108	$p = 0.006$
Yes (N = 68)	28 (41.2 %)	34 (50.0 %)	6 (8.8 %)		
No (N = 19)	10 (52.6 %)	3 (15.8 %)	6 (31.6 %)		
Number of employees				1.071	$p = 0.899$
0–1 (N = 39)	18 (46.2 %)	16 (41.0 %)	5 (12.8 %)		
2–5 (N = 40)	18 (45.0 %)	16 (40.0 %)	6 (15.0 %)		
At least 6 (N = 3)	1 (33.3 %)	2 (66.7 %)	0		
Age of the company				3.022	$p = 0.554$
0–10 years old (N = 22)	11 (50.0 %)	8 (36.4 %)	3 (13.6 %)		
11–20 (N = 29)	9 (31.0 %)	16 (55.2 %)	4 (13.8 %)		
At least 21 years old (N = 32)	16 (50.0 %)	12 (37.5 %)	4 (12.5 %)		
Company co-operate with a DMO				5.482	$p = 0.065$
Yes (N = 63)	25 (39.7 %)	31 (49.2 %)	7 (11.1 %)		
No (N = 23)	13 (56.5 %)	5 (21.7 %)	5 (21.7 %)		

4 Results

4.1 Clustering Tourism Businesses

Table 2 describes the differences in three cluster solution based on the barriers tourism businesses face when thinking about adopting social media for business use. As can be seen from the Table 2, the three clusters differ from each other in many ways. First cluster is clearly limited by lack of resources. They do not have time, money or skills to start using social media in their business.

The businesses in the second cluster are not so concerned about the use of time and money for adopting social media but are clearly concerned about the benefits of social media, how to use it and especially potential risks when compared to other clusters. They score especially high on bad earlier experiences on social media. These seem to be companies that have tried social media at some point but have given up using it because of bad experiences. It should also be noted that they score quite high on all items, meaning that almost every barrier in this study influence their decision not to use social media.

Members in the third cluster are only concerned about the potential benefits that social media could have on their business. They are clearly happy about how their business is going and feel like they do not need social media to improve it.

Table 2 Three business clusters based on barriers to adopt social media

	Cluster 1"No resources" (N = 38)		Cluster 2 "Concerns" (N = 37)		Cluster 3"No need" (N = 12)		Total
	Mean	S.D	Mean	S.D.	Mean	S.D.	Mean
Company feels like it does not gain any benefits from using social media	2.11	1.134	**3.30**	1.244	**3.42**	1.311	2.79
Not enough time to use social media	**3.39**	1.386	3.14	1.159	2.42	1.564	3.15
Not enough (monetary) resources	**2.87**	1.436	2.51	1.121	1.42	0.515	2.52
Not enough skills to implement social media	**3.87**	1.07	**3.86**	0.948	1.33	0.492	3.52
It is unknown for the company how to best utilize social media in business	**3.50**	1.247	**3.70**	1.051	1.67	0.888	3.33
Fear for critique or negative feedback	1.63	0.786	**3.08**	1.233	2.17	1.586	2.32
Social media is a risk for information security	2.18	1.062	**3.43**	1.015	1.92	1.24	2.68
Bad experiences of social media	1.18	0.512	**2.62**	1.187	1.67	1.231	1.86
Company can do well without social media.	2.71	1.313	**3.49**	0.989	**3.58**	1.505	3.16

Note Bold signifies cluster mean is higher than overall mean

4.2 Comparison of Business Clusters

There are not many statistically significant differences between company attributes and social media use barriers (Table 1). Only statistical difference is between businesses that have tourism as the main business and those for which tourism is only a side business. There are a lot more concerned businesses among those for which tourism is the main business whereas those that are practicing tourism only in the side think that social media does not have any benefits for them and that they do well without it.

5 Conclusions, Limitations and, Further Research

This study aims to find out why some tourism companies do not use social media. Through an interview process nine items creating barriers for using social media are identified. Based on the mean scores the four most important reasons for not adopting social media are lack of skills, lack of knowledge on how to utilize social media for business purposes, companies do well without social media and lack of time to use social media.

Finnish tourism businesses can be clustered into three clusters based on how the aforementioned nine items affect their choices not to use social media in their business. For the first cluster, the main reasons for not using social media are lack of resources, thus they are called the "No resources". They need more time and monetary resources to adopt social media as part of their business. For this group of

businesses it is crucial to offer financial support as well as increasing their knowledge on social media use. This group of companies is indeed interested and willing to start using social media as part of their business but lack the resources to do it.

Second cluster, labelled the "Concerns", have the resources needed for social media presence but are afraid of the risks involved in adopting social media such as information security. There are also companies in this group that have earlier but negative experiences of social media. They also regard that they are doing well without social media and social media does not have any benefits to offer for their company.

Last group of businesses, the "No need", indicate that they have no need for social media services. They would have the resources to adopt social media and are not afraid of the risks involved in using it but they do not see any reasons why they should use social media. Their businesses are doing well without it.

When organizing training courses and when consulting companies existence of these three groups should be accounted for. The needs of tourism companies differ regarding social media adoption. Some companies have acknowledged the benefits of social media but lack resources to use it. Other companies do not regard social media as something that they need in their business but would have resources to adopt it if needed. Last group of companies have bad experiences of social media and are afraid of the risks that might come with it. They are not very concerned about the resources but other factors are more important in influencing their social media adoption. Knowing the history of social media usage of these companies could shed some more light into why they have bad experiences of social media. These could be for example Innovators from innovation diffusion theory (Rogers 2003) that failed to utilize social media at its early stages, thus resulting them being Laggards today. These are important factors for example for DMO's and development projects that aim to develop their local tourism businesses online presence. Different kind of assistance has to be provided for each three groups of companies in order to get them use social media. The "No resources" need monetary support and expertise to adopt social media, the "Concerns" need information on how to address the risks and the "No need" need to see if and how social media could benefit their business.

This study extends the research on barriers on technology adoption in information systems, in this case social media in tourism business. The need for this kind of research has been acknowledged in the earlier literature (Goode 2005). Through the use of cluster analysis in-depth knowledge on the topic could be gained. There are different kinds of companies with different problems that require different solutions. In many parts this study is congruent with earlier studies. Similar barriers were found by Goode (2005) and Michaelidou et al. (2011). This study extends the knowledge of technology adoption barriers to social media in travel and tourism context.

This study also provides evidence that not all tourism businesses need social media, at least at this point of time. Company size, age or co-operation with DMO do not explain the differences between the importance of the different barriers. However, there is a very small group of businesses that are doing well without

adopting social media. A lot of tourism businesses for which tourism is not a main business are included in this group. These could be for example farms that are only renting cottages as a side business through an intermediary. Co-operation with DMO might have something to do with the phenomenon but the evidence from this study are inconclusive as the statistical significance level is above 0.05.

The main limitation in this research is the sample size. The number of businesses not using social media is shrinking all the time as more and more companies adopt social media as part of their business strategy. As only 87 tourism companies that did not use social media answered the questionnaire conclusive, nation-wide results are hard to say for certain. The small sample size affects significance levels and for example there could be statistically significant differences between co-operation with DMOs and different business clusters if the sample size would be larger. However, more work is done in order to collect a larger, more representative sample. In the future also comparison between companies that have adopted social media and that have rejected it will provide more information on why some companies do not use social media.

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Prioritisation of Key Performance Indicators in an Evaluation Framework for Determining the Economic Value and Effectiveness of Internet Room Diagramming Solutions by the Application of AHP

Kuan-Wen Lin, Andrew J. Frew and Joe Goldblatt

Abstract Previous studies suggest the effectiveness of eBusiness applications such as Room Diagramming Solutions could be monitored through a hierarchical evaluation framework in the post-adoption stage. However, an evaluation model should not only indicate what is important to be measured but also each measurement should be weighted. This study uses an Analytic Hierarchy Process survey conducted with venue operators in the U.S. chain hotel systems for generation of the priorities and weightings of the criteria which had been previously identified. Perceived stakeholder and social pressure was weighted as the most important indicator. Information and Communication Technologies impact on customer satisfaction was considered with high priority, and which echoes relevant research. The criteria prioritised could be adopted to conduct further research concerning performance measurements such as the ICT Balanced Scorecard for strategic management. The research approaches used could also be applied to performance measurements for innovative ICT applications such as social media.

Keywords ICT impact · Meetings and events · Room diagrams · ICT effectiveness · AHP

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1 Introduction

In the field of Information and Communication Technologies (ICT) usage in the hospitality industry, ICT investment has been regarded as an important element for continuing business success (Buhalis et al. 2011). O'Connor (2004) claims that over the past decades of the explosion in the use of ICT, great attention has been paid to which system and application should be installed first and which one will provide the most benefits to the hospitality business in question rather than whether to computerise or not. Furthermore, there is a great deal of overlap and interaction between the hospitality and tourism industry and the meetings and events industry (PricewaterhouseCoopers 2011). For example, Lee et al. (2013) believe that the growing variety of general ICT tools have been requested by meeting and event planners to support their work responsibilities. In their research it is claimed that ICT applications may help event planners to achieve their business goal of producing a successful event that fulfils a client organisation's objectives, and therefore enables the client to better understand the value and service that the planners add to events. However, the quality of the ICT use and the economic impact generated through its implementation should be assessed, particularly when it is used for meeting and event organisations' decision-making such as investment (Kim et al. 2011; Lee et al. 2010). Casanova et al. (2005) and Yuan et al. (2006) believe that in the meeting and event industry ICT has provided better customer service, facilitating destination management, leading to the creation of new business models and reducing planning time and costs.

Room Diagramming Solutions (RDS) have been widely used in event management to generate electronic graphic room layouts and to design seating plans and room set-up diagrams in order to facilitate communication between meeting and event planners and the event venues they use (O'Connor 2004). However, it has been argued that there is a gap between the importance of this technology tool and the added value that sales personnel perceive the tools bring in terms of their daily sales responsibilities; previous research considers that insufficient follow-up training could be one of the reasons causing this gap (Jones and Baloglu 2006). There is an absence in the assessment studies of the post-adoption of Internet RDS within both meeting and event and eTourism literature. To the authors' best knowledge, only limited previous studies include RDS within their research on eBusiness applications, and there are very few published academic articles that focus on the economic value and effectiveness of RDS to venue operators (Lin et al. 2013).

Therefore, through the Delphi method, a multi-staged survey which attempts ultimately to achieve consensus on an important issue, idea, argument or opinion (McKenna 1994), a previous study (Lin et al. 2013) successfully developed a framework to help event venue managers to monitor the economic sustainable efficiency of their RDS and incorporated a comprehensive set of dimensions and criteria within this indicator system for the RDS evaluation. However, it is claimed that an evaluation model for ICT applications should not only indicate what is

important to be measured but also each measurement should be weighted (Horan 2010). In traditional measurement such as the Likert Scale, where elements or factors are scaled one by one and individually, the potential connections among these factors are ignored. Therefore, through the use of a more sophisticated weighting method, Analytic Hierarchy Process (AHP) technique, which mainly supplies an approach, based on human biology and psychology, to improve and advance the conventional methods through a paired comparison concept, this paper demonstrates the results of these advanced research processes.

2 Assessment of the Economic Value and Effectiveness of Internet Room Diagramming Solutions

The Professional Convention Management Association (PCMA), which was founded in 1957, is an organisation for the promotion of the value of professional convention and meeting management (Fenich 2012; Goldblatt 2011). A "Space Verification Program" was initiated in 1994 by PCMA in order to help meeting planners and venues to validate meeting and event room specifications (Rogers 2008, p. 294). In response to the need from both meeting and event planners and venue managers for the third-party guaranteed electronic blueprints, the program was expanded in 1997 (Bielski 1997). A team of surveyors from PCMA were sent to the participating hotels and venues to conduct space inspections and measurements and this resulted in the rendering of electronic room diagrams for planners to view. The resulting approved space verification seals were requested by some managers in hotels and venues as new promotional materials for their properties. These venue professionals were in the habit of underselling space because of worries about potentially inaccurate blueprints and room setups. It is believed that the PCMA program relieved these worries and mitigated the potential risk of underselling or overselling available space (Bielski 1997). Considerable investment was needed in order to receive verification of the space in the venues, however, taking a long-term view, the space verification may also reduce the potential costs which are incurred by poor communication such as misunderstanding of the local fire and safety codes in inaccurate room diagrams.

Moreover, with the assistance of RDS, meeting and event planners no longer need to visually imagine a room setup for the events they are planning. Meeting and event planners can repeatedly use the digital diagrams to create setups and layouts of their events. Professionals can also examine the precise room setups in a three-dimensional (3D) virtual tour to facilitate better dialogue with the venue managers and suppliers. A click of a button transfers the accurate sizes of windows, chairs, lighting and special decorations to a virtual 3D walkthrough, and viewers may not even be aware if the scenes are real or virtual (Fenich 2012). In addition, the Internet-based search capabilities of RDS innovation lead to a closer match between venue organisations and their customers such as event planners

with greater reach than before. Furthermore, with the support of cloud computing technology, users can directly design the event setups on the web pages of the targeted venues ignoring the complicated software downloading processes of the past (E-Hospitality 2011). Torrence (2003) believes that the functionality of an interactive accurate floor plan in event management websites is one of the new most desirable features requested by meeting and event planners. Cho et al. (2002) consider by the provision of 3D web-based virtual experience, which uses environmental simulations, the image of a physical place could be created and communicated without actually visiting the place. It is also claimed by Fiore et al. (2005) that the adoption of 3D interactive websites could help the consumers make more informed decisions and could advance customer loyalty and word-of-mouth advertising. It is claimed that the detailed and formatted information contained in RDS such as the default cross aisle width or the distance between chairs could help to improve the efficiency of communication among event stakeholders and provide an outlet for transmitting a completed request or issue (Torrence 2003). Both event planners and suppliers such as venue providers, by embracing ICT innovations like RDS, may benefit in terms of improved efficiency and productivity. The time and effort saved could be used by event planners to focus on return on investment and the set agenda rather than purely on logistics. As for venue operators, better service could, therefore, be provided, and the technological innovations may build a new client base through new channels such as online Requests for Proposals.

However, researchers have recognized that ICT cannot guarantee profitability unless "certain prerequisites are satisfied, namely long term planning, innovative business processes re-engineering, top management commitment and training throughout the hierarchy" (Buhalis 1998, p. 410). It has been argued that different ICT applications contribute to varying extents to business performance and contribute in diverse ways, especially in the hospitality industry, and these applications should be measured by different criteria (Fuchs et al. 2010; Ham et al. 2005). Some efforts toward the development of an evaluation framework measuring effectiveness have been made in the field of hospitality management for Destination Management Systems (Fuchs et al. 2010; Horan 2010). Effectiveness is defined as the extent to which a desired set of goals or outcomes is achieved (Horan 2010). However, there is very little relevant research specific to RDS which can provide a generally accepted evaluation framework to assess the economic value and effectiveness of RDS in the meeting and event industry. In order to build on its success, it is of critical importance for RDS, as an important ICT tool for meeting and event planners, to justify its business value using quantifiable performance measures which will assist venue managers to ensure the efficient use of this technology tool.

Therefore, through the use of a modified Delphi method, a previous study (Lin et al. 2013) has successfully generated and validated a hierarchical framework and a comprehensive set of dimensions and Key Performance Indicators (KPIs) for RDS effectiveness evaluation from the perspectives of the key stakeholders who are in charge of the investment decision of RDS in meeting and event venues (i.e. hotels or convention centres), the educators in higher education institutes who

include RDS in their teaching and the industrial consultants recognized by the RDS industry. The research paper joined the debate of general ICT productivity in the academic community and suggested that a performance-based indicator system which could accommodate both tangible and intangible factors influencing ICT outcomes and which could be monitored constantly could be used to demonstrate long-term ICT value. Unlike previous relevant studies which concerned the adoption stage of ICT at organisational or individual level and used the Technology Acceptance Model as the key basis for adoption or non-adoption of decision making processes, the paper was concerned with the post-adoption stage. Therefore, innovation diffusion theory, Technology-Organisation-Environment (TOE) framework and the eBusiness impact model were used in this study as suggested by previous relevant literature (Fuchs et al. 2010; Zhu et al. 2006). These three fundamental theories and relevant previous research suggest that in the post-adoption stage by systematically analysing the actual use and characteristics of ICT innovation in the adopting organisations, the value created by ICT could be realised through monitoring relevant KPIs.

3 Methods

The selection of a research design is subject to the availability of techniques, procedures, protocols and a sampling plan (Cooper and Schindler 2006). Tallon et al. (2000, p. 148) claim that "in the absence of objective data on IT payoffs, executives' perceptions can at least help to pinpoint areas within the corporation where IT is creating value". Rogers (2003) claims that subjective and perceived attributes of innovation diffusion drive the innovation diffusion process and could affect the success of the innovation adoption. Tornatzky and Klein (1982) suggest that quantitative approaches such as surveys, secondary data analysis and experiments which allow some degree of cross-study comparison and replicability may be methodologically suitable for the model studies of innovation characteristics. Furthermore, it was found that the perceptual data from senior managers correlate with objective economic performance measures such as revenues and productivity (Tallon and Kraemer 2007). Jarvenpaa and Ives (1991) found that senior managers' perceptions toward ICT and organisations' progressive use of ICT have a strong relationship and association. Kuan and Chau (2001) suggest that characteristics of a specific ICT innovation could be identified through a perception-based approach such as surveying decision makers and users. Use of a scale system (i.e. 1–5) is suggested in the measurement in order to aggregate stakeholder' views on an innovation (Ettlie and Vellenga 1979). For example, previous research used the Likert Scale when conducting surveys to identify ICT evaluation indicators (Fuchs et al. 2009). Moreover, Zhu et al. (2006) and Fuchs et al. (2010) have started to use senior managers' perceptions of the economic impact and usage of ICT adoption and post-adoption when developing models or frameworks for the monitoring of ICT diffusion.

A comprehensive set of dimensions and KPIs for RDS effectiveness evaluation has been identified and validated by a previous study (Lin et al. 2013). However, it is claimed that an evaluation model for ICT applications should not only indicate what is important to be measured but also each measurement should be weighted (Horan 2010). In traditional measurement such as the Likert Scale, where elements or factors are scaled one by one and individually, potential connections among these factors are ignored.

The Analytic Hierarchy Process (AHP) is a mathematical method which assists group decision-making. As a result of the homogeneity of judgments and the aggregation of choices via the calculation of a geometric mean, the individual views of the group members could be aggregated into a single view (von Solms 2009). Saaty (2005) claims that the intuitive conducting of pairwise comparisons among factors is part of our biological heritage, and people may need to develop systematic approaches to cope with a world where everything is potentially relative and constantly changing: a so-called "problematique" (Zopounidis and Doumpos 2000, p. 15). AHP mainly supplies a technique, based on human biology and psychology, to improve and advance the conventional approaches through a paired comparison concept. The relative values of each factor could be derived from the judgments which use numerical values taken from the AHP absolute fundamental scale. The priorities (weightings) among the factors in a homogeneous cluster with respect to their hierarchical parent are generated by this approach which uses matrix algebra and eigenvalue technique to weigh factors (Kahraman et al. 2007). Thus, the issues of measuring performance, setting priorities, structuring and synthesis in multi-criteria models could be dealt with through the application of AHP. AHP has been described and recognised in many top management science journals, such as Operations Research, as a phenomenon which could be applied in a wide range of decision-making issues and subjects (Forman and Gass 2001). The theoretical underpinnings and mathematical psychology of AHP have, because of its popularity, also been carefully and widely investigated and examined in academic circles (Crouch 2011). In the hospitality information technology management research field the AHP method has also been adopted for calculation of user assessments of dimension/attribute weightings and performance ratings in hotel website performance evaluation (Ip et al. 2012).

The identified and validated KPIs from the previous research (Lin et al. 2013) were used in this study for the design of an AHP questionnaire. After pilot testing, the final AHP questionnaire was distributed to the venue operators in the U.S. chain hotel systems for the generation of the priorities and weightings of the KPIs and dimensions. The MeetingMatrix client base was used to conduct this survey. MeetingMatrix is recognised as one of the most renowned providers of interactive diagramming solutions for the hospitality industry and is the current supplier for PCMA Space Verification (Davis 2005). Expert Choices Software (http://expertchoice.com/) was implemented to calculate the AHP results in this study. The software which was recommended by previous literature in 2001 was used in over 1,000 AHP related academic articles and almost 100 doctoral dissertations (Forman and Gass 2001).

4 Results

3,105 valid email contacts were generated from MeetingMatrix Customer Resources Management system according to the set criteria, venue operators in the U.S. chain hotel systems. After pilot testing with 200 randomly selected email addresses, the distribution of this survey was conducted in November 2012 and resulted in 48 effective responses after several reminder emails being sent. Among the 48 responses, 29.2 % of the respondents regard themselves responsible for the investment decision of RDS; 75 % of respondents also consider themselves to be users of RDS. Almost 80 % of the respondents have more than 10 years experience in meeting and event businesses. 58.3 % of the respondents describe their jobs as belonging to meetings, events, banquet and catering; 20.8 % to sales and marketing; 18.8 % to information technology; 2.1 % to quality and efficiency. The work locations of the effective 48 respondents are well spread around the U.S. The age group 40–49 dominates the profiles of the respondents (54.2 %). The number of male respondents (31) is almost twice that of females (16).

It is suggested that an aggregate measure of the pairwise comparisons of all participating individuals could be obtained by means of calculation of the geometric mean of the individual judgments in AHP research (Saaty 2000). Geometric means were calculated, and transitive law was used to form the foundation of the consistency tests of this AHP study. Consistency index (CI) and consistency ratio (CR) are used in the technique of AHP to evaluate the degree of closeness to consistency. It is suggested that a CI or a CR of 0.10 (10 %) or less could be considered as a tolerable error in measurement (Benlian 2010). The CI and CR of each matrix were calculated with the assistance of the software Expert Choice version 11.5.1815. All CI and CR values are lower or equal to 0.10 except for Set Goal ($CR = 0.12$) and Factor Tier G_Technology Competence ($CI = 0.11$; $CR = 0.19$). It is suggested that the inconsistency could be improved through asking surveyees to reconsider their original values in the pairwise comparison matrix or through conducting sensitivity tests in order to eliminate the values which have high inconsistency (Tsai and Ho 2009). Considering the limitations of time and resources in this research, the sensitivity tests for Set Goal and Factor Tier G_Technology Competence were conducted in order to improve the CI and CR. By eliminating values from a specific response in Set Goal, the adjusted CR can be improved to the suggested tolerable level ($CI = 0.05$; $CR = 0.09$). By eliminating values from three specific responses in Factor Tier G_Technology Competence, the adjusted CI and CR can be improved ($CI = 0.06$; $CR = 0.10$). The adjusted weightings of the categories, factor tiers and KPIs are given in Fig. 1 and Table 1 respectively (The results were rounded to the nearest tenth).

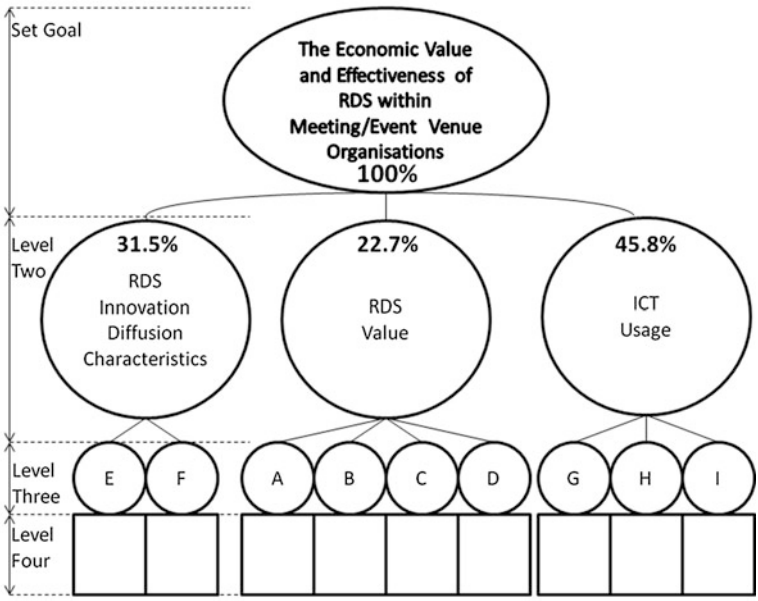

Fig. 1 The adjusted weighted categories

5 Analysis

The weighted KPIs from this study have the potential to be used in the evaluation model and monitoring of the continuous and sustainable economic value and effectiveness of RDS (the set Goal). For example, as seen in Fig. 1 and Table 1, the AHP technique helps to synthesise a group consensus that 45.8 % of the hierarchical index system should be composed of the indicators which explain RDS-related ICT usage in the adopting hotels (at Level Two). Moreover, under the RDS-related ICT usage category, the group indicators on "Factor Tier I_external environmental context" at Level Three (sub-category, the Factor Tier) should account for 20 % of the set Goal. The indicator "I2_perceived stakeholder and social pressure" at Level Four should account for 13.4 % of the set Goal.

From the results of this AHP survey, it can be found that among the 24 KPIs within the framework for monitoring the economic value and effectiveness of RDS, the indicator "I2_perceived stakeholder and social pressure" was weighted as the most important indicator and accounted for 13.4 % of the set Goal. It could be explained that ICT applications such as RDS may help event planners to "fulfil their primary goal to produce a meeting that meets a client organisation's goals" and enable the client to better understand the value that the planners add to events (Lee et al. 2013, p. 8). Therefore, the requests and perception from meeting and event planners is crucial for venue operators regarding the effectiveness of RDS. In addition, from the results cost reduction and direct sales improvement were not

Table 1 The adjusted weighted key performance indicators

Factor tier	Weighting		Key performance indicator
	At level three (%)	At level four (%)	
Factor tier **A_Impact on Sales**	2.5	0.5	A1_Increased number of new clients
		1.3	A2_Booking rate at the meeting/event venue
		0.7	A3_Sales per labour hour
Factor tier **B_Impact on Efficiency**	3.8	0.6	B1_Costs of internal processes and labour costs
		1.0	B2_Total labour working hours
		1.2	B3_Costs of coordinating business partners
		1.0	B4_Marketing costs
Factor tier **C_Impact on Business Partner Relationships**	5.1	1.5	C1_Interactive service quality with meeting/event service suppliers
		3.6	C2_Interactive service quality with meeting/event planners
Factor tier **D_Impact on Customer Satisfaction**	11.2	2.3	D1_Satisfaction level of meeting/event guests directly attributable to functionality of meeting/event room's set up
		3.0	D2_Interactive service quality with meeting/event guests
		5.9	D3_Satisfaction of meeting/event planners
Factor tier **E_Compatibility**	12.9	2.8	E1_RDS products and services are compatible with the event venues' current selling processes
		4.1	E2_RDS products and services are compatible with the existing distribution channels
		6.0	E3_Adopting RDS products and services is compatible with the meeting/event venues' corporate innovation culture and value systems
Factor tier **F_Observability and Trialability**	18.5	11.2	F1_Observability: the degree to which the results of an innovation are visible to others
		7.3	F2_Trialability: the degree to which an innovation may be experimented with
Factor tier **G_Technology Competence**	11.0	1.8	G1_ICT infrastructure
		3.1	G2_ICT skills
		6.1	G3_Skill development
Factor tier **H_Organisational Context**	14.8	5.6	H1_Financial commitment
		9.2	H2_Organisational scope
Factor tier **I_External Environmental Context**	20.0	6.6	I1_Perceived competitive pressure
		13.4	I2_Perceived stakeholder and social pressure

considered as the important indicators for monitoring the post-adoption performance of RDS in venue management. This is similar to the findings of the study conducted by Fuchs et al. (2009) for eBusiness adoption in Austrian hotels.

6 Conclusions and Outlook

It is claimed that "the combined judgment of groups displays greater intelligence than isolated individuals and can often provide surprisingly accurate estimates when four conditions are met: diversity of opinions, independence of opinions, decentralized local knowledge, and a mechanism for aggregating judgments" (Crouch 2011, p. 31). Although the research findings, which stem from the opinions of a group of users, from investment decision makers and from stakeholders of RDS applications, must be viewed as indicative and perception-based (O'Connor and Frew 2004), a practical set of weighted indicators for consideration of the RDS evaluation process has been provided for further development and exploration. In addition, it has been claimed that little innovation diffusion research has focused on the relative contribution of the innovation diffusion characteristics such as compatibility with, and complexity of the adoption (Rogers 2003). The research presented bridges this gap in the innovation diffusion research through aggregating the opinions from the venue managers working in the field by means of the technique of AHP. The present empirical results have a more sophisticated weighting method which numerically evaluates venue managers' perceptions of the economic value and effectiveness of RDS. The effective responses from the 48 experienced venue managers, therefore, are invaluable for future research in the field of meeting and event technology management. To the authors' best knowledge, the findings are the first ever of this kind in the field and could provide a springboard for further research. The findings from this RDS research are similar in some aspects to the perspectives which have been discovered in the hospitality industry such as the high prioritise of importance of ICT impact on customer satisfaction for eBusiness adopting hospitality organisations in value creation processes (Fuchs et al. 2010).

This research also has implications for various aspects of meeting and event technology management. The research results scientifically generated economic and operational priorities of the venue clients' needs in terms of RDS products and services. These priorities may provide insight to RDS suppliers wishing to provide better services to customers. The research findings can also be developed to explore and set up the priorities of the Research & Development plan for RDS suppliers. Furthermore, by adopting the research results, RDS service providers could develop and provide a practical framework and products for its venue clients to enable them to monitor the sustainable economic value and effectiveness of RDS in use (Hsieh et al. 2006). In addition, the high priority of indicators of "F1_Trialability" and "F2_Observability" indicate the need to optimise the layout and web hosted-location of RDS products and services in the adopting hotels'

websites. RDS service suppliers may provide some best practices or examples to assist the clients in achieving the optimisation. This result also provides robust evidence for the development of the prospective cloud-based products and services with high trialability and low installation time comparing it with traditional RDS products. This industrial trend has also been confirmed by general Computer-Aided Designing software providers such as the launch of Adobe Photoshop Creative Cloud products and by general office software suite providers such as the services of Microsoft Office Web Apps.

The AHP survey respondents in this study were from the client database of a leading provider of RDS products and services, MeetingMatrix and from the U.S. In future studies, clients from other RDS suppliers such as Newmarket and from other countries may be surveyed, and the revalidation of the KPIs and this framework may be achieved. In addition, in future studies, the KPIs prioritised in this research could be adopted to conduct research concerning performance measurements such as the ICT Balanced Scorecard for strategic management. It is suggested that when designing and implementing a specific ICT Balanced Scorecard, the first step is to identify the representative and meaningful measures for the ICT itself (Buglione et al. 2001). Furthermore, the research processes and approaches used in this study not only bridge the research gap on RDS studies but may also provide a new perspective for the construction of performance measurements of innovative ICT applications such as social media.

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Study on Factors to Adopt Mobile Payment for Tourism E-Business: Based on Valence Theory and Trust Transfer Theory

Jianqing Huang, Yahui Li and Hailin Li

Abstract By using the valence theory and trust transfer theory, this study builds a mobile payment adoption model where consumers shift the payment from tourism websites to mobile apps. The study uses structural equation model based on 323 questionnaires data to test the impact of the trust in on-line payment on initial trust in mobile payment as well as the impacts of consumers trust, and its positive and negative utilities on consumers' behaviour intention to adopt mobile payment. The findings of the empirical study indicate that: (1) users' trust in on-line payment via tourism website significantly impacts the initial trust in mobile payment; (2) perceived usefulness and perceived ease-of-use and consumers' innovativeness positively and significantly impact the users' intention to adopt mobile payment; (3) initial trust in mobile payment by increasing perceived usefulness has significant impacts on users' intention to adopt mobile payment, both directly and indirectly.

Keywords Tourism e-business · Mobile payment · Trust transfer · Valence theory · User's adoption

1 Introduction

To meet the increasing travel demand of customers, tourism portals such as Taobao Trip and Qunar.com have been investing heavily on mobile payment and wireless clients, where consumers are able to search travel products and make payments via mobile phones. Qunar.com has installed the complete functions of mobile payment on IOS and Android—the mainstream smart systems, supporting

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payment from ten banks such as China CITIC Bank; the built-in Ali-pay on Taobao Trip Client also allows users to purchase tickets on a real-time basis. While previously mobile phones could only be used to make basic searches on travel products and information, today's successful emergence of mobile payment is critical to and is the precondition for the development of mobile business for tourism.

Nowadays, large travel portals are keen on adventuring into the new mobile business for travelling. Study shows that the consumers' adoption of mobile payment is vital to its development. Davis (1989) said that when a new technology has eliminated all barriers of usage, the users' intention to adopt the technology becomes the vital factor for its success. What exactly are the factors to influence customers' intention to use mobile payment? What is the relation between on-line payment and mobile payment? The answers to these questions are of great significance to promote the adoption of the new technology and its success. This study will discuss mobile payment for tourism e-business from these two perspectives.

2 Theories and Hypotheses

2.1 Hypotheses Based on Valence Theory

Peter and Tarpey (1975) have proposed valence theory based on perceived risks and perceived benefits. The theory hypothesis is that consumers' purchase of products will have positive and negative utility and they will make a decision that maximizes their net utility. Valence theory has been applied to the E-business scenario in some literatures, and has been verified. Valence theory is also consistent with the theories of Lewin (1943) and Bilkey (1953, 1955), which provides the theoretical framework of this study.

Positive Utility. In the primitive valence theory, only one variable, perceived benefits, is measured in user's perception. However, we have to stress the important position of TAM in the study of mobile payment. As early as 1989, Davis (1989) has put forward the Technology Acceptance Model (TAM), which later on has gradually become one of the most extensively applied models in the study of IT adoption. In the model, Davis (1989) raised the two major decisive factors to consumers' attitude towards the use of technologies: Perceived Usefulness (PU) and perceived Ease of Use (PEOU). PU refers to the extent to which a user believes his or her working performance increases by using a certain system; PEOU refers to the degree of difficulty for a user to use some system. Since its formation more than 20 years ago, many scholars have studied and extended the TAM, and the TAM has gained rather consistent support for its ability to explain the theory.

A user's PU and PEOU bear direct impact on his or her behaviour intention (BI) to adopt mobile payment in tourism E-business. On this basis, the study raises the following hypotheses:

H1 PU has significant and positive impact on users' intention to adopt mobile payment in tourism E-business.
H2 PEOU has significant and positive impact on users' intention to adopt mobile payment in tourism E-business.

Moreover, since mobile payment is relatively in tourism, the extent to which consumers accept and use an innovative product, or the consumers' innovativeness (CCR) will make a dent on their attitudes towards accepting new technologies, and many researches also indicate that CCR positively influence their intention to use mobile payment (Rogers and Shocmaker 2002). Since mobile payment in this market has yet to be popularized, many consumers have never been exposed to or used it, therefore, the more innovative the consumers, the more likely that they will accept mobile payment. Based on the above analysis, the study raises the following hypothesis:

H3 CCR has significant and positive impact on their intention to use mobile payment in tourism E-business.

Negative Utility. The perceived risk (PR) is a major barrier for consumers to use mobile payment. In this study, PR is defined as the uncertainties of potential negative consequences when users are making mobile payment. Existing researches find out that users' PR will influence their decisions on mobile payment. Generally speaking, compared with the conventional on-line payment, it is more difficult for users to accept mobile payment. For travel products such as air tickets, most people purchase them on their own computers in advance, and only a few do so when they are travelling on the road, because mobile phone's exposure to public areas inevitably entails some risks, and the connections may not be stable. Therefore, PR exerts big influence on the adoption of mobile payment. This study raises the following hypothesis:

H4 PR has significant and negative impact on consumers' intention to use mobile payment in tourism E-business.

The primitive valence theory only measures PR when evaluating the perceived negative utility of users, however, when users make mobile payment, they need to pay for extra cost, including mobile phones, communication and transactions. Many researches verify that perceived cost (PC) serves as a main factor to impede the adoption of mobile payment (Shin 2009; Luarn and Lin 2005). On this basis, this study raises the following hypothesis:

H5 PC has significant and negative impact on consumers' intention to use mobile payment in tourism E-business.

2.2 Hypotheses Based on the Trust Theory

The trust theory emerged at the early 20th century, and it was widely applied in psychology and then gradually extended to management and marketing. Scholars have their own definitions of trust. This study studies trust in the context of E-business, about which there are a lot of literatures. The definition of trust in the E-business context emphasizes the importance of transaction environment. Kini and Choobineh (1998) believe that trust refers to "the ability to believe in the environment, reliability and safety under risky circumstances", a definition from the risk perspective.

Due to the inherent nature of mobile payment, consumers are exposed to various risks. Under these uncertainties, trust has become the way to solve these risks. In face of uncertainties and uncontrollable consequences, trust has become the key factor. Trust may mitigate the risks in mobile payment via two means: firstly, under the condition that consumers have to bear risks due to their inability to control the consequences completely, the trust is relevant; when trust increases, consumers' PR is lower than the one that lacks trust. Therefore, trust has impacted the consumers' intention of adoption indirectly by reducing risks. Secondly, some scholars who study trust argue that there is a direct relation between trust and the intention to use mobile payment (Kim et al. 2009). Therefore, trust will directly and indirectly influence the intention of adoption. On this basis, the study arrives at the following hypothesis:

H6a The initial trust in mobile payment (TOM) in tourism E-business has significant and positive impact on consumers' intention of adoption.

H6b The TOM in tourism E-business has significant and negative impact on the PR.

In addition, some researches show that the increased trust will elevate the users' PU; therefore, this study makes the following hypothesis:

H6c The TOM in tourism E-business has significant and positive impact on the PU.

2.3 Hypotheses Based on Trust Transfer

Mobile tourism is a transition from on-line to off-line environment. This transition will also transfer the users' trust from on line to off line, hence the need to study the concept of trust transfer. Trust transfer generally means that people's trust in one field will influence their trust in other fields (Lee et al. 2007). Kim et al. (2009) divides trust transfer process into intra-channel transfer and inter-channel transfer. Intra-channel transfer means that trust may transfer from one trustable entity to

another unknown entity, and such transfer occur under the same scenario, where users' long-term use of a product or service will gradually accumulate trust, and such trust will influence other products within the same channel; the inter-channel trust transfer generally includes three types of transfers, namely on line to on line, off line to off line, and mobile to mobile. In conventional literatures of corporate marketing, there exists researches on trust transfer from off line to off line; however, there are only a few about trust transfer from on line to on line. Inter-channel trust transfer refers to the transfer of trust from one environment to another, including two types of transfer: off line to on line, and on line to mobile. Many scholars have studied the trust transfer in E-business. Kuan and Bock (2007) has studied the trust transfer to click retailers and found out that the users' trust in the brick retailers significantly and positively influence their trust in the click retailers. The study by Lu et al. (2011) indicates that users' trust in on-line payment (TOI) has significant and positive influence on the TOM. Based on the statement above, this study puts forward the following hypothesis from the perspective of trust transfer:

H7 The TOI through travel websites has significant and positive influence on the TOM.

On the basis of the valence theory, and supported by the trust theory and trust transfer theory, this study builds the model of consumers' adoption in tourism E-business, as shown in Fig. 1.

3 Scale Development and Data Collection

3.1 Scale Development

This research collects data by sending out questionnaires and then summarizes the factors that influence the consumers' intention to adopt mobile payment in tourism E-business. Therefore, the design of the questionnaires is the key to the empirical study. This study develops the scales based on the fundamental principles and procedure of questionnaire design. In an effort to collect the complete information of users, the questionnaire is composed of two parts: main body and basic information. The main body designs questions by adopting the Likert Scale, and the options are on a scale of 1–5, from totally disagree to totally agree. This part measures the users' perception on influencing factors. The other part of the questionnaire is the users' basic information, including gender, age and education, which intend to check the demographic features when the questionnaires are returned so that the questionnaires can have a wide coverage. The basic information also includes how users utilize the mobile payment in tourism E-business, which can show the differences of users with varied demographic features in using mobile payment. The design of the scale in the main body is as shown in Table 1.

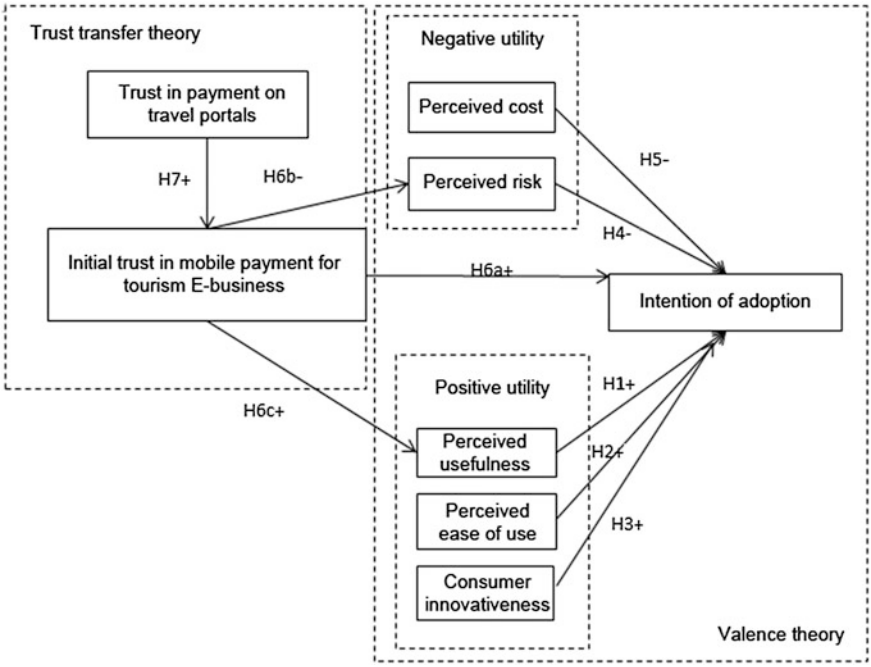

Fig. 1 Model of consumers' adoption of mobile payment in tourism E-business

To ensure validity of the questionnaire, a pre-survey was conducted within a narrow scope of users when the draft design was completed, and the returned data was subject to validity and reliability tests, as a result, the unqualified variables were kicked out or improved to enhance the validity of the questionnaire, which can better measure the views of users in mobile payment in tourism E-business.

3.2 Data Collection

The questionnaires were distributed on line, and responses were received from 26 provinces and cities such as Jiangsu, Shanghai, Beijing, Shandong, Hong Kong, as well as from abroad. The survey has received 352 responses. After removing those incomplete and unclear samples, 323 samples remained. The description of the samples is as indicated in Table 2. Among the interviewees, 166 of them are males, and 157 females, 288 of them have made on-line payment on computers, making up 89.16 % of the total interviewees, and 201 people have used mobile payment, accounting for 62.33 %. Statistics demonstrates that on-line payment is moving towards mobile payment, and more and more people are purchasing travel products by making mobile payment. Wireless travel market enjoys remarkable potential for development.

Table 1 Questions and references

Factors	Meas. items	Content of the measurement items	Reference
Behaviour intention (BI)	BI 1	I am willing to use mobile payment in tourism E-business	Pedersen (2005)
	BI 2	If already used mobile payment in tourism E-business, I will continue to use it	
	BI 3	I will recommend mobile payment to my families and friends	
Perceived usefulness (PU)	PU 1	Mobile payment in tourism E-business can achieve fast transaction and save time	Davis (1989), Taylor and Todd (1995)
	PU 2	Mobile payment in tourism E-business makes it possible to purchase travel products anytime and anywhere, and it is very fast and convenient	
	PU 3	All in all, using mobile payment in travelling activities is useful to me	
Perceived ease of use (PEOU)	PEOU 1	It is easy to activate mobile payment	Davis (1989) Taylor and Todd (1995)
	PEOU 2	It is easy to use mobile payment proficiently	
	PEOU 3	All in all, it is easy to purchase travel products via mobile payment	
Consumers' innovativeness (CCR)	CCR1	I am usually an early adopter of new technological products than people around me	Pedersen (2005)
	CCR2	I often actively search some information on new technological products	
	CCR3	All in all, I am more ready to accept new views and things	
Perceived risks (PR)	PR1	Using mobile payment entails provision of private information, which I am worried about	Kim et al. (2009)
	PR 2	I am worried that others may use my account when my mobile phone is lost	
	PR 3	I am worried that in case of system error, the transaction fails but the fee is still deducted	
Perceived cost (PC)	PC1	I am not willing to use mobile payment for tourism E-business because it will consume a lot of flux	Pedersen (2005)
	PC2	I am not willing to use mobile payment because it is costly to purchase the equipment (primarily mobile phones)	
	PC3	I am not willing to use mobile payment to purchase travel products because it will incur high cost	

(continued)

Table 1 (continued)

Factors	Meas. items	Content of the measurement items	Reference
Initial trust in mobile payment (TOM)	TOM1	Mobile payment in tourism E-business is able to provide safe and reliable service for transaction	Kim et al. (2009)
	TOM2	Mobile payment in tourism E-business enables accurate and smooth transaction	
	TOM3	I believe mobile payment in tourism E-business is reliable	
Trust in on-line payment (TOI)	TOI1	Using mobile payment via computer can provide more reliable and safer service for transaction	Kim et al. (2009)
	TOI2	Using mobile payment via computer can complete transaction more accurately and smoothly	
	TOI3	I believe purchasing travel products and on-line payment via computer is reliable	

Table 2 Description and statistics of the data

Variables	Categories	Frequency	Percentage
Gender	Male	166	51.39
	Female	157	48.61
Age	24 and below	35	10.84
	25–34	194	60.06
	35–44	83	25.70
	45 and above	11	3.41
Education	High school and below	11	3.41
	Vocational college	50	15.48
	Undergraduate	227	70.28
	Post graduate and above	35	10.84
Monthly salary	Below 1,000 RMB	16	4.95
	1,000–3,000 RMB	49	15.17
	3,000–5,000 RMB	99	30.65
	5,000–8,000 RMB	96	29.72
	Above 8,000 RMB	63	19.50
Have purchased travel products on computers	Yes	288	89.16
	No	149	10.84
Have purchased travel products on mobile phones	Yes	201	62.23
	No	122	37.77

Cross analysis finds that as the education background improves, the proportion of users who have made mobile payment to buy travel products also increases. Among users with bachelor's degree and master's degree, 64.32 and 62.86 % of them respectively have used mobile payment, yet only 36.36 % of the users with

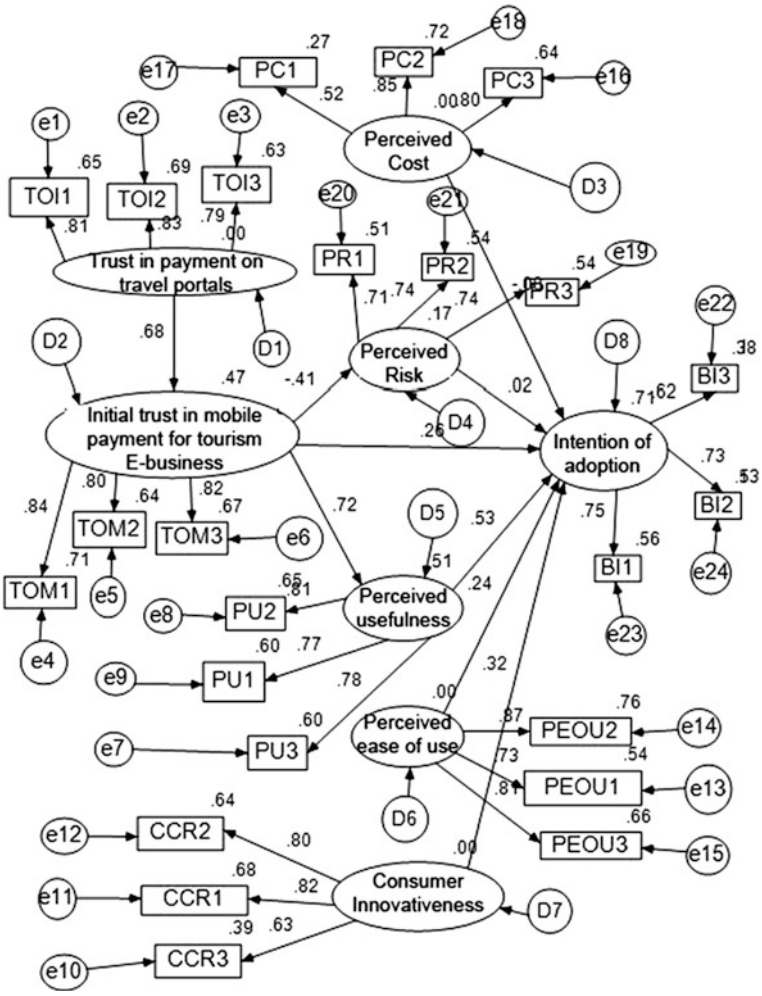

Fig. 2 AMOS testing parameters

high school degree or below have done so. Moreover, among the group of people aged between 25 and 34, 67.01 % of them have used mobile payment, while the figure stands at 50 % for users of other age group. As the income rises, the proportion of users who have used mobile payment also expands. To sum up, education background and income are proportional to utilization of mobile payment, and young people tend to take a larger share.

Table 3 Results of hypotheses test

Hypotheses proposed by this study	Results	Estimate
H1: PU has significant and positive impact on the intention to use mobile payment for tourism E-business	True	0.452
H2: PEOU has significant and positive impact on the intention to use mobile payment for tourism E-business	True	0.194
H3: CCR has significant and positive impact on the intention to use mobile payment for tourism E-business	True	0.195
H4: PR has significant and negative impact on the intention to use mobile payment for tourism E-business	False	0.01
H5: PC has significant and negative impact on the intention to use mobile payment for tourism E-business	False	−0.06
H6a: The TOM for tourism E-business has significant and positive impact on the intention to use mobile payment	True	0.218
H6b: The TOM for tourism E-business has significant and negative impact on PR	True	−0.591
H6c: The TOM for tourism E-business has significant and positive impact on PU	True	0.708
H7: The TOI for tourism E-business has significant and positive impact on the TOM	True	0.654

4 Data Analysis and Hypotheses Testing

4.1 Validity and Reliability Tests

This study uses SPSS 16.0 Software to test the validity and reliability of the questionnaire. The Cronbach's Alpha coefficient of the Scale is 0.806, indicating that the questionnaire is valid. The reliability of each factor is also subject to test, and the Cronbach's Alpha coefficient of each sub-scale is all higher than 0.8, indicating good reliability of each sub-scale. Meanwhile, this study also tests the structural validity of the questionnaire by factor analysis on data, using SPSS software. This study conducts KMO test and Bartlett's test on data. The findings show that KMO (Kaiser–Meyer–Olkin) statistics of the data is 0.910, Chi square value of Bartlett's test is 4,294 (degree of freedom is 276), and concomitant probability is 0.000. This means that the data is suitable for factor analysis. Then SPSS is used to do varimax rotated principal component analysis to all the indicators and conduct explorative factor analysis. Five factors were extracted whose characteristic value is bigger than 1, the accumulative explained variance is 65.145 %, and all the factor loads are bigger than 0.5, demonstrating fine validity of the questionnaire, hence no need to remove any items.

4.2 Test of Structural Equation Model

After passing the validity and reliability tests, this study has used structural equation model (SEM) to verify the hypotheses. SEM, a relatively new research methodology focused by many researchers studying tourism, has rapidly become popular among various research methodologies in tourism science. This study adopts AMOS to build the structural equation model in which data was put in and tested.

Results show that the fitness of each indicator is all within acceptable scope and the parameters of the hypotheses test results are as shown in Fig. 2. According to the hypotheses test of AMOS SEM, the result is that under the prominence condition of $p = 0.05$, seven out of the aforementioned nine hypotheses are accepted, shown in Table 3.

5 Conclusion

Based on the trust transfer theory and valence theory, this study takes into account the features of tourism E-business to build the consumer's adoption model for the mobile payment, and this study also conducts empirical analysis over the model according to the data from 323 questionnaires, and the conclusions are reached as follows:

First, trust in on-line payment on tourism websites has significant and positive impact on the TOM for tourism E-business. The correlation coefficient between the two is 0.654, indicating close correlation of the two. This conclusion has once again proved the validity of trust transfer theory from the perspective of tourism E-business. As China's mobile payment in tourism E-business is in the early stage of development, trust transfer theory serves as a great reference to the development of this market in the future. The tourism E-business should, in its effort to expand to the wireless market, take into account the correlation between users' trust in internet and in the mobile environment. It should strengthen the trust of existing users on internet and then transfer their trust into mobile environment and develop new users.

Second, the TOM for tourism E-business has significant and positive impact on consumers' intention of adoption, and the correlation coefficient between the two is 0.218. The TOM for tourism E-business has direct and positive impact on the intention of adoption, and has indirect impact through PU. The coefficient of the impact of TOM for tourism E-business on PU is 0.708, the coefficient of the impact of PU on the intention of adoption is 0.452, which further states the important role of TOM, and initial trust has exerted double impact on the intention of adoption. This conclusion points to the important role of initial trust in promoting the adoption by consumers. To tourism websites, they may try to strengthen users' TOM to encourage them to ultimately use it.

Third, PU (0.452), PEOU (0.194) and CCR (0.195) have significant and positive impact on the intention of adoption. Among them, PU has the highest coefficient of the impact on intention of adoption, which effectively verifies the TAM. Companies for tourism E-business should focus on building professional and high-quality websites that provide the best user experience, enhancing and enriching the functions on the websites, diversifying the travel products, meeting the customized needs of consumers, creating pleasant-looking and convenient user interface, learning from the operating model of some established and excellent tourism website from abroad, as well as bringing in new marketing notions and innovation. As a result, the users' travelling needs will be fully satisfied and supported, which will gradually build their trust in the websites.

Fourth, the impact of PR and PC on the intention to use mobile payment is not significant. Contrary to the views verified by previous researches, the empirical study of this study concludes that there is no significant impact of PR and PC on the mobile payment. The author believes that three major reasons have led to this conclusion: firstly, the number of smart phone users has been very large; according to "Projection over China's development trend of mobile payment 2011–2014" by EnfoDesk, a think tank, "by the end of 2011, the number of users of mobile payment has reached 187 million", the size of mobile payment has been expanding steadily every year, and consumers' trust in mobile payment is also increasing accordingly. Secondly, China Mobile, China Unicom and China Telecom, the three carriers, have all released different kinds of service packages and flux packages; Wi-Fi coverage in scenic spots and cities has been constantly expanding, and the cost of flux incurred for mobile payment is lower than before. Lastly, consumers value the quality of travelling and the pleasant feeling brought about by travelling, so the cost incurred from mobile payment for travel products constitutes a primary factor of influence. Therefore, the impact of PR and PC on mobile payment is not significant, and the tourism E-business should put more of their marketing efforts on other influencing factors.

There are some limits and drawbacks in this study, and the number and scope of samples should be expanded in the follow-up researches. Moreover, the existing model is based on the valence theory and touches upon TAM and the trust theory, but some other consumer behaviour theories are not taken into consideration. Therefore, other theories should be fully considered in the future research to improve the existing model.

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Part X
eLearning

eLearning Courses Offered by Tourism Destinations: Factors Affecting Participation and Awareness Among British and Indian Travel Agents

Nadzeya Kalbaska and Lorenzo Cantoni

Abstract Destination Management Organizations are using ICTs not only to reach individual tourists, but also to educate through eLearning courses travel agents on how to better sell tourism destinations. While the "supply side" of such training offers has been mapped, its "demand side" is still under-researched. In particular, awareness of and participation in destinational eLearning courses on the side of travel agents need to be investigated in order to provide a clearer picture of this area within eTourism environment. In this research, 462 British and Indian travel agents have been surveyed through phone interviews, in order to understand which factors influence their participation in and awareness of the existence of destinational eLearning courses. Results show that country where travel agents work has a significant influence on participation and awareness, while type of agency plays a significant role only on participation; gender, age and level of instruction do not play any relevant role.

Keywords eLearning · Distance education · Tourism training · Travel agents · DMOs

1 Introduction

Destination Management Organizations (DMOs) are extensively using online training platforms in order to deliver education, training and certification to their travel trade partners through on-purpose developed eLearning courses. Such

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eLearning courses present tourism destinations, their particularities, and selling tips that may help travel agents to get higher profits and to serve better clients. The "supply side" of this eLearning offer has been extensively mapped and presented both to the academic research community and to the industry practitioners (Cantoni et al. 2009; Cantoni and Kalbaska 2010; Kalbaska 2012; O'Donnell 2012), through the analysis of existing eLearning offers, their contents and functionalities, as well as methods used for course creation and delivery. On the contrary, the "demand side" of this training offer is still under-researched (Kalbaska et al. 2013). In particular, awareness of or participation in such eLearning courses on the side of travel agents have been neglected and need to be investigated further.

This study will evaluate the number of travel agents who are currently doing destinational eLearning courses in the United Kingdom and India, as well as the rates of awareness about the existence of such offers among travel agents that haven't done them before. Moreover, this study will evaluate if the country where travel agents are based, their age, gender, level of education and type of the agency they work for, have any influence on their participation in or awareness of the existence of eLearning courses about tourism destinations.

Selected countries for this study are based in two different geographical regions, presenting a mature tourism market—United Kingdom, which has been benefiting from the outbound mass tourism development during the last century, and an emerging one—India, where outbound tourism has started to being developed in the last years. According to Li (2003), developing tourism markets have a low level of tourism market penetration, higher market growth than developed ones, and require higher investments into the establishment of the tourism distribution channels and development of market-specific knowledge. United Kingdom and India have different levels of ICT and internet adoption and penetration, as well as different service cultures. Furthermore, travel agencies in the developed countries have seen significant competition from Online Travel Agencies (Buhalis 2001; Reid and Pearce 2008), while it hasn't been so strong on the Indian travel market (Khare and Khare 2010). Furthermore, the requests of tourists on two markets differ as well: while in the United Kingdom tourists have been travelling as independent travellers in the last 50 years, Indian travellers still significantly rely on the help of travel agents.

2 Literature Review

Hospitality and tourism industry, due to its complexity—growing number of globally dispersed tourism corporations, high ratio of Small and Medium Tourism Enterprises (SMTEs), high level of staff turnover, seasonality, etc.,—provides unusual challenges for training and education suppliers. Educators within the industry need to solve the issue of access, more complicated and sophisticated deliverability, and increased time and efforts needed for the training. Additionally,

increasing complex nature of tourism and hospitality along with the continuous state of changes and uncertainties within business environment create a situation that requires constant learning for all the employees of the industry (Cho and Schmelzer 2000).

In early 2000s traditional teaching methods were adopted by several tourism organizations, which were providing training to their employees on-the-job or in-house. Many tourism managers were reluctant on delivering the training to their employees outside of their normal working environment, due to the time and costs involved. Though, according to Haveng-Tang (2005), several SMTEs were looking for short training courses with a flexible structure, which could meet their needs. eLearning courses became such a solution, as they were able to customize training needs both of the individuals and companies (Schweizer 2004). Indeed eLearning started to represent the missing link between the new market requirements and needed qualification strategies as well as continuous educational offer within the tourism sector (Cantoni et al. 2009). It is generally acknowledged that the industry is well suited to adopt and use eLearning, as nowadays technology in general became central within the working environment of tourism employees, e.g. travel agents and tour operators use computer on a daily basis in order to book hotels or airline tickets, or to collect information about tourism destinations. As eLearning provides new opportunities to become competent for the employees of the sector, since that in the last decade many hospitality and tourism companies have started to adopt online trainings and intranets for their knowledge management activities and as means of increasing skills and knowledge guidance along with other methods of training delivery (Baum and Sigala 2001; Lominé 2002). In the tourism industry eLearning is particularly well-suited for SMEs (Collins et al. 2003), which in several cases are positioned in geographically peripheral zones and have difficulties finding time and resources to involve the employees into traditional in-presence training programs. Additionally tourism corporations have also seen the benefit of eLearning usage as an additional tool to training provision among employees globally especially in the multi-unit firms.

Academic research on eLearning has been very fragmented, though several attempts by tourism academics to understand and discuss the use of eLearning in the hospitality and tourism have been made. The relevance and advantages of eLearning for the tourism and hospitality education have been acknowledged in recent years likewise (Cantoni 2012; Haven and Botterill 2003; Kuttainen and Lexhagen 2012; Nadkarni and Venema 2012; Sigala 2002). Based on a study by Cantoni et al. (2009), existing online courses in the field of the hospitality and tourism can be classified into four categories according to the providers of the online training service: "Academic" courses provided by officially registered educational institutions; "Corporate" courses managed by a company working in the hospitality and tourism field, and provide training for the employees; "Destination Management Organization" courses are provided by tourism boards for the education and certification of their travel trade partners and "Independent" courses—online training offers where the provider is a third party other than an academic institution, a tourism enterprise, or a DMO.

For the purpose of this study, eLearning courses provided by DMOs were taken into consideration. DMOs globally have started to leverage on digital technologies in order to offer an online learning environment about destinations at different levels, being it a city, a region or a country, to travel professionals, such as travel agents in order to help the latter ones to better serve their clients, potential tourists, when presenting a given touristic place (Cantoni and Kalbaska 2010), thereby hoping to deliver better services and products to their clients.

Training and education on tourism products and destinations is what drives travel agents' ability to influence potential tourists according to what agents revealed themselves in a recent PhoCusWright research (2012). Travel agents nowadays are looking for personalized training, as clients ask them for specifically tailored pieces of information (Lawton and Weaver 2009; Patterson 2006). Travel agents are also looking for certification, which may be helpful to differentiate themselves from their competitors as well as to get credibility in the eyes of potential tourists.

According to UNWTO (2008, pp. 197–199): "There are some DMOs that offer training and accreditation online to retail travel agents to become "destination specialists". This service is delivered online, either by the DMO or in conjunction with a specialist company". Destinational eLearning platforms are specifically structured for travel agents' needs, and provide a comprehensive view of what a destination is about and give to the trade partners the knowledge and skills to sell the destination more effectively and to the right people. The content of DMOs eLearning courses is represented in especially designed learning and teaching modules covering general information about the destination itself, which includes geographical position, demographics, languages spoken, etc., as well as history, culture and traditions, accommodation and transportation systems, formality issues, selling tips, and the help in itinerary planning. By the end of the course, acquired knowledge is evaluated through testing activities, usually done in a form of a quiz. Examples of such courses include Switzerland Travel Academy, Aussie Specialist Program or Kiwi Specialist Program. According to the web resource www.elearning4tourism.com, in September 2013 there were 75 DMOs at the national level offering eLearning courses about tourism destinations, while the number of regional courses and online trainings about cities and other tourism attractions is growing as well.

3 Methodology and Sample

The purpose of this research is to understand the rates of current usages and awareness of eLearning courses about tourism destinations among travel agents in the United Kingdom and India, and to analyse factors that influence them. In order to reach above presented research objectives, the next research questions were formulated:

Research Question 1: Is there a demand among travel agents based in the United Kingdom and India on attending eLearning courses about tourism destinations?
Research Question 2: Does the demand differs by the country were travel agents are based, their gender, age, level of instruction, and type of agency they work for?
Research Question 3: Is there awareness among travel agents based in the United Kingdom and India on the existence of DMO eLearning courses?
Research Question 4: Does the awareness differs by the country were travel agents are based, their gender, age, level of instruction and type of the agency they work for?

This study has been done in the form of a random sampling phone interviewing of officially recognised outbound travel agents based in the United Kingdom and in India. Chosen research strategy has resulted in rich data that is unlikely could have been collected from the use of other research techniques, for instance, from an online survey.

According to the UK Office of the National Statistics (2011), there were 10,470 travel agencies in the United Kingdom. Furthermore, in 2010 there were 45,700 employees working within the sector in the country (People 1st 2011, p. 37). As there is no official list of the travel agents and travel consultants registered in the United Kingdom, travel agents were randomly selected from British yellow pages list. Out of available 8,151 travel agencies' contacts, 341 travel agencies were contacted. The profiles of the contacted travel agents appeared under combination of the next search keywords: "travel agent", "travel consultant", "travel expert", "outbound", "overseas". The selection process took into consideration geographical distribution of the travel agents and type of the company (e.g. chains, franchising, self-employed) they work for. In order to possess larger information in the collected data set and having a hypothesis that the employees of the chains and franchising might have similar internal training strategies and human resource development approaches, just one person per chain or franchising company was contacted.

According to the European Travel Commission (2010), Indian Ministry of Tourism in 2010 has approved 1,246 travel agencies with over 20,000 employees. Out of the available contacts in the list of the Ministry of Tourism, 364 travel agencies were contacted randomly, following identical selection procedure as with the British travel agents.

A pilot study was undertaken with three British and three Indian travel agents working in different types of agencies in order to ensure the content validity of the research questions. The pilot study ensured the right flow of the questionnaire, appropriate usage of the terminology for both countries, as well as gave an indication on the time needed for the phone interview completion. Phone interview questions have been refined based on the feedback obtained. The interviews were done with the sales staff—travel agents, advisors and consultants, as well as with managers, if those were working with the end-clients. Phone interviews were done with the help of VoiP system—Skype. The length of the interviews was on average

from six to eight minutes with a mix of close-ended and open-ended questions. Travel agents who have previously done eLearning courses about tourism destinations had fourteen questions to answer, while those who have no previous experience on studying online had eight questions to respond. Quantitative data from phone interviews were entered into the IBM SPSS Statistics 19. General descriptive statistics procedures were first applied. Additionally correlations among variables were done using Pearson Chi Square test and Univariate Analysis of Variance.

4 Results

Research results will be presented along the next structure: first, the characteristics of the respondents will be shown, looking at the gender of the respondents, their age and years of work in the tourism industry, their level of education and the agency type they work for. Then the results analysis will proceed with the assessment of the participation and awareness rates of the travel agents in two studied countries in the eLearning courses about tourism destinations and the assessment of the factors influencing it.

4.1 Characteristics of the Respondents

Within this study, 725 phone calls were done in order to achieve 462 successful interviews with the travel agents in the United Kingdom and in India (Table 1). On a country-by-country basis, the next results were obtained: United Kingdom—341 calls brought 190 interviews, and accounted for 55 % of the response rate; India—364 calls brought 272 interviews with 75 % of the response rate.

Gender. From the obtained results, which are synthetically represented in the Table 1, it can be noted that in the United Kingdom 62.6 % of the respondents were women, while in India women accounted for 43.4 %. Above-mentioned numbers are aligned with a common gender distribution in the hospitality and tourism field in the developed countries, where female employees prevail. For instance, the Department of Business Innovation and Skills of the Office of National Statistics (2011), suggested that in the United Kingdom 82 % of the workforce within the tourism industry were female.

Age. Three main age groups were identified within this research: the first group, which include the respondents younger than 32 years old, represents the employees of the "generation Y", those that were born and raised with a different use of new technologies and are believed to have different use of technologies for working purposes as well as for their knowledge upgrade (Rapetti and Cantoni 2010; Selwyn 2009). While the other two groups represent each circa fifteen years

Table 1 Characteristics of the respondents to phone interviews

		United Kingdom	India	Total
Total		190	272	462
Gender	Male	71 (37.4 %)	154 (56.6 %)	225 (48.7 %)
	Female	119 (62.6 %)	118 (43.4 %)	237 (51.3 %)
Age	<32	56 (29.5 %)	99 (36.4 %)	155 (33.6 %)
	32–47	68 (35.8 %)	140 (51.5 %)	208 (45 %)
	>47	66 (34.7 %)	33 (12.1 %)	99 (21.4 %)
Agency type	Independent	42 (22.1 %)	76 (27.9 %)	118 (25.5 %)
	Chain	148 (77.9 %)	196 (72.1 %)	344 (74.5 %)
Education	Secondary school	70 (36.8 %)	13 (4.8 %)	83 (18 %)
	Vocational training	81 (42.6 %)	83 (30.5 %)	164 (35.5 %)
	University degree	39 (20.6 %)	176 (64.7 %)	215 (46.5 %)

of professional life. In the United Kingdom three age groups are equally distributed, while about 88 % of Indian travel agents are younger than 47 years old.

Level of education. In terms of the level of education among interviewed travel agents, it's important to observe significant differences. Indian agents are mostly very well educated: 64.7 % of them possess a university degree, followed by 30.5 % of the respondents, who hold vocational school degrees, while less than 5 % are working in the travel agency after graduating from a secondary school. This can be explained by the importance of the role, that is given to the work in the travel agency sector in India, as well as by a higher entry level for these types of jobs, which is set by the employers in developing countries due to the scarcity of working positions. While looking at British travel agents, it can be noted that 36.8 % of them possess a degree in a secondary school, followed by 42.6 % with a vocational one, and 20.5 % of the employees of the travel agency sector who have graduated from a university.

Agency type. In the United Kingdom, 77.9 % of the travel agents were working in independent agencies and 22.1 % in chains or franchising companies. In India those proportions are quite similar: 72.1 and 27.9 %.

4.2 Participation in eLearning Courses About Tourism Destinations

The next paragraph will present descriptive details on the rates of the participation in the eLearning courses about tourism destinations by travel agents based in the United Kingdom and India. Furthermore, the results of the Univariate Analysis of Variance will be discussed. This analysis has evaluated if the country in which travel agents are based, their gender, age, agency type they work for and the level of education they possess, have any influence on their participation in the eLearning activity.

Table 2 Frequencies and participation rates in the eLearning courses about tourism destinations in the United Kingdom and in India

		United Kingdom	India
Total		103 (54.2 %)	72 (26.5 %)
Gender	Male	29 (40.8 %)	36 (23.4 %)
	Female	74 (62.2 %)	36 (30.5 %)
Age	<32	28 (50.0 %)	23 (23.3 %)
	32–47	35 (51.5 %)	42 (30.0 %)
	>47	40 (60.6 %)	7 (21.2 %)
Agency type	Independent	71 (48.0 %)	37 (18.9 %)
	Chain	32 (76.2 %)	35 (46.1 %)
Education	Secondary school	40 (57.1 %)	1 (7.7 %)
	Vocational training	45 (55.6 %)	7 (8.4 %)
	University degree	18 (46.2 %)	64 (36.4 %)

Among interviewed travel agents, 54.2 % (103 respondents) of those that are based in the United Kingdom have previously undertaken eLearning courses about tourism destination, while 26.5 % (72 respondents) of the working travel agents in India that were interviewed have done the same. According to the results of the phone interviews, it can be concluded that the participation level of agents in such a training activity varies significantly between studied countries.

Table 2 demonstrates frequencies and participation rates in eLearning courses about tourism destinations in the United Kingdom and India, stratified by gender, age, agency type, and educational level of the interviewed travel agents. Travel agents who are working for chains or franchising companies are undertaking more often eLearning courses about tourism destinations in both countries: e.g. 48 % of British travel agents who are working for independent enterprises have previously undertaken eLearning courses, while 76.2 % of the respondents working for chains or franchising companies have done the same. Similar differences among Indian travel agents can be noted. Significant difference can be observed in terms of the age of the eLearning users, for instance 60.6 % of the interviewed British travel agents who are older than 47 years have done eLearning courses. This number is much lower within the same category in India (21.2 %). While analysing gender and the use of technologies, there are several studies (Bromley and Apple 1998; Klein 2007), which suggest that a gender bias exists in the way the technology is used, where male users are more likely to use technologies. Travel agency sector has proved to be different, as the use of technologies (e.g. management of the reservation systems) is essential for the day-to-day operations. In fact in both countries, the behaviour of travel agents in terms of gender is similar, as female agents are proportionally participating more in eLearning experiences than male agents. The results of the phone interviews show that 36.4 % of the travel agents who possess a university degree in India have previously done eLearning courses; while only 8.4 % of those who have a vocational degree and 7.7 % of those having secondary school degree have done the same.

Table 3 Results of the full factorial model of univariate analysis of variance on the participation in eLearning courses about tourism destinations

Source	Type III sum of squares	df	Mean square	F	Sig.
Country	5.340	1	5.340	27.723	0.000
Gender	0.740	1	0.740	3.842	0.051
Age	0.372	2	0.186	0.965	0.382
Type of agency	0.889	1	0.889	4.614	0.032
Education	0.174	2	0.087	0.453	0.636
Error	77.625	403	0.193		
Total	1,323.000	462			

In order to assess if the country in which travel agents are based, their gender, age, agency type they work for and the level of education they possess have any influence on the participation in the destinational eLearning courses Full Factorial Model of the Univariate ANOVA, using IBM SPSS Statistics 19 has been undertaken.

Table 3 presents synthetic results of the Univariate Analysis of Variance, which confirms that the "country" where travel agents are based ($p = 0.000$), and the "type of agency" they work for ($p = 0.032$) have significant influence on the participation in the eLearning courses about tourism destinations. While the "age" of the travel agents, their "gender" and "level of education" are not significant in the decision to participate in such courses ($p = 0.382$; $p = 0.051$; $p = 0.636$).

4.3 Awareness of the Existence of eLearning Courses About Tourism Destinations

The results obtained from phone interviews with the travel agents in the United Kingdom and in India, show two different levels of awareness among those travel agents that have not previously done eLearning courses about tourism destinations. While 65.5 % of the travel agents who are based in the United Kingdom were aware of the existence of such eLearning courses, only 36.5 % of Indian travel agents who knew that such a training option exist for them have not previously tried it. These results can have an implication on the work of the trade managers at the tourism destinations, as they could promote more extensively their eLearning courses among Indian travel trade as well as among travel trade in other developing and emerging countries. Additionally, as the numbers of the awareness are about 2/3 of the total of those travel agents that have not previously done eLearning courses in the United Kingdom; their a-motivations on not undertaking such a training activity should be explored further.

Table 4 demonstrates the rates of awareness among travel agents in studied countries, who for several reasons decided not to undertake such a training activity, stratified by gender, age, agency type they work for, and educational level they possess.

Table 4 Rates of awareness among travel agents in the United Kingdom and in India on the existence of destinational eLearning courses

		United Kingdom	India
Total		57 (65.5 %)	73 (36.5 %)
Gender	Male	24 (57.1 %)	42 (35.6 %)
	Female	33 (73.3 %)	31 (37.8 %)
Age	<32	17 (60.7 %)	21 (27.6 %)
	32–47	23 (69.7 %)	43 (43.9 %)
	>47	17 (65.4 %)	9 (34.6 %)
Agency type	Independent	48 (62.3 %)	50 (31.4 %)
	Chain	9 (90 %)	23 (56.1 %)
Education	Secondary school	21 (70.0 %)	3 (25.0 %)
	Vocational training	25 (69.4 %)	21 (27.6 %)
	University degree	11 (52.4 %)	49 (43.8 %)

Table 5 Results of the univariate analysis of variance about the evaluation of the awareness about eLearning courses on tourism destinations. Full factorial model

Source	Type III sum of squares	df	Mean square	F	Sig.
Country	1.343	1	1.343	6.012	0.015
Gender	0.214	1	0.214	0.959	0.328
Age	0.068	2	0.034	0.153	0.858
Type of agency	0.184	1	0.184	0.824	0.365
Education	0.320	2	0.160	0.716	0.490
Error	52.962	237	0.223		
Total	758.000	287			

Significant difference can be seen in terms of the gender of the eLearning non-users: more than 70 % of the female British travel agents that haven't previously done eLearning courses about tourism destinations were aware that such a training offer exists, while the number is lower among female Indian travel agents and accounts for 37.8 %. Similar to the results in the participation in eLearning courses, travel agents who are working for big agencies, chains or franchising companies have higher awareness of the existence of eLearning courses about tourism destinations. Focusing again on these companies, it can be noted that more than 90 % of the travel agents in the United Kingdom among those who haven't done previously eLearning courses about tourism destinations knew that such a training option exists. This number is lower among Indian travel agents and accounts for 56.1 %.

Same procedure as with the analysis on the participation in the eLearning courses has been undertaken with the "awareness" and is presented further. Table 5 presents synthetic results of the Univariate Analysis of Variance, which shows that just the "country" where travel agents are based ($p = 0.000$) has significant influence on the awareness about eLearning courses among those travel agents who haven't participated in such courses previously. Other four variables,

such as "gender" ($p = 0.328$), "age" ($p = 0.858$), "type of agency" ($p = 0.365$), and the level of "education" ($p = 0.490$) of the travel agents, are not showing significant influences on their awareness about possible eLearning experiences.

5 Discussion and Conclusions

This research provides first empirical results in the field of the use of ICTs for Human Resource Management of the travel trade, and it is one of the first studies on the eLearning usages within on-the-job training in the tourism industry. Phone interviews with the travel agents based in the United Kingdom and India were undertaken in order to get the rates of current usages and awareness of eLearning courses in the studied countries, and to investigate what influences awareness and participation in eLearning courses about tourism destinations.

This study has answered the research questions: Re *Research Question 1* this study confirmed that there is a demand among travel agents in two studied countries on attending eLearning courses about tourism destinations, though it varies from country to country. The level of demand is nearly twice as big among travel agents based in the United Kingdom, where nearly 55 % of them have previously undertaken eLearning courses, while in India just 26.5 % of the working outbound travel agents have previously undertaken eLearning courses about tourism destinations.

Re *Research Question 2* this study revealed that participation in the eLearning courses about tourism destinations depends on the country where travel agents are based and the type of the agency they work for, while the age of the travel agents, gender and educational level didn't show any significant influences on the participation level. Re *Research Question 3* this study shows the level of awareness varies among those travel agents in two studied countries that haven't previously done eLearning courses about tourism destinations. While 65 % of the travel agents in the United Kingdom were aware of the existence of the eLearning courses about tourism destinations, only 36.5 % of Indian travel agents knew that such a training option exist for them. Re *Research Question 4* the results of the analysis showed that the awareness about existence of the eLearning courses about tourism destinations depends on the county of where travel agents are based, and doesn't depend on their age, gender, type of the agency they work for or their educational level.

The research gave the first insights into the awareness of the travel agents on eLearning courses about tourism destination, as well as into the rates of participation in them by travel agents based in two studied countries, one developed and one emerging market—United Kingdom and India. As for the research field, this study contributes to tourism eLearning literature, within a given professional family, that of travel agents. Concerned industry representatives, such as marketing, trade partnership and training managers within ministries of tourism, regional and local tourism boards are presented with the first research on travel

agents' participation and awareness when it comes to eLearning training platforms. This research can help representatives of the DMOs to better understand the role of online training for travel agents, and therefore develop more efficient and effective strategies in their trade and training partnerships globally.

The next limitations of current study should be mentioned. Respondents to the phone interviews might have been influenced by their supervisors or colleagues who were present during phone interviews in the office. However, such situations are beyond the researcher's control and couldn't be tackled. Few questions with a simplified structure could have been asked both due to the nature of the phone interviews and that travel agents are being disturbed during their busy working hours while the interviews were happening. As a solution for the mentioned limitations, a further online questionnaire, which might evaluate current research issues in-depth, or might study further motivation factors of the travel agents who have previously followed eLearning courses about tourism destinations, can be designed in the future. Furthermore, this research might be replicated with the travel agents based in other developed and emerging countries in order to evaluate cultural differences and better support or decline the conclusions of this study. As a future research line, the effectiveness of eLearning courses about tourism destinations might be taken into consideration.

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The Property Management System: The View from the Front Desk on Training and Performance

Hilary Catherine Murphy

Abstract This paper examines the critical role of the Property Management System (PMS). The PMS is the key information technology for hotels, though these PMS systems are not exploited to their full potential. Previous research has identified a lack of training as a key barrier to full exploitation, thus, this paper investigates in-depth the role of PMS training. A qualitative approach using in-depth interviews is undertaken to give insights into why training budgets and time taken for training are low. The interviews with front desk managers show that front desk personnel themselves conduct most of the training and that specific budget allocated for front desk training is limited, training days are minimal and not fully integrated into IT budgets or strategy.

Keywords Technology · Training · Performance · PMS

1 Introduction

The Property Management System (PMS) is the key information technology (IT) for hotels and a large source of data that can help manage and monitor hotel performance by informing the strategic and operational decision making. Unfortunately, as seen from previous research (Kokaz and Murphy 2011, 2012) the PMS has not been exploited to their full potential with training and knowledge-sharing identified as the main obstacles to full utilization This study specifically investigates the links between the usage of this key technology system and particularly the role of training on the PMS in exploiting the full potential of the data held by the PMS.

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2 Literature Review

The proliferation of ICTs has impacted on processes and people with numerous opportunities for many industries, particularly the hotel and tourism industries (Wang et al. 2010). Various authors have reaffirmed the critical importance of ICT to hotel operations, particularly the central role of the PMS. For Chathoth (2006), the PMS is central to everything that goes on in a hotel operation with multiple mission-critical operational processes. Again, Chathoth (2007) illustrates that improved productivity, service quality, and operating profits can be achieved through the effective use of IT. Moreover, Ingram (1997) states that, specifically, customer service, labour productivity and revenues can be improved through the effective use of IT. Here we review key issues impacting on front desk performance and how performance, per se, is measured. PMS specific training is examined in order to reveal the role of training in the successful exploitation of the PMS.

2.1 The Key Technology in the Hotel: The PMS

Technology has played a critical role in the management of hotels since the 1960s. Most hotels at property level own or lease a PMS. Often, it is referred to as the single most important IT application for hotels, though more recently the focus of research has been on the hotel website, customer service, customer experience and mobile uses (Law and Jogaratnam 2005; Frash et al. 2010; Law et al. 2013). The PMS is the source of data for rate management, reservations and room allocation and the link to the online booking systems and partners in the distribution channels. While, from the guest point of view, the PMS is mostly unobtrusive, it remains critical to the operational effectiveness of the business. It is, arguably, the most expensive investment that hotels make in technology from, not only a financial perspective, but also a human resource perspective.

As previous studies by Murphy and Kokaz (2011, 2012) have shown, at property level, there is a large under-utilization of the range of the PMS functionalities which is restricted to front desk personnel and results in low return on investment from the PMS software investment. In most operations, the PMS is restricted to routine, operational tasks like room allocation and guest billing (Murphy and Kokaz 2011). This lack of awareness and under-utilisation of the full range of PMS functionality by other departments and key decision-makers impacts on all aspects of the property's performance.

2.2 Training and Hotel Performance

Training in the hotel industry has long been the source of academic and practical discussion (Ross 1990; Frash et al. 2010). Most of the training is 'on the job', lacks

formal structure and tends to take traditional formats. Kline and Harris (2008) reveal that due to a "haphazard approach to corporate spending and tracking training, one of the major expenses in the lodging industry… [there is] a failure of hoteliers to expect accountability for the investment into employee development" (p. 45). Hotel managers fail to invest in ICT training and also fail to measure the success of any training. This further detracts from successful exploitation of technology investment. This lack of training transfer is further highlighted by several authors (Frash et al. 2010; Kline and Harris 2008). Other authors support the rationale that it is organizational structure specifically which impacts on successful exploitation of technology and data (DeLone and McLean 1992; Bharadwaj 2000). In the hotel sector Law et al. (2013) make the case "to allocate sufficient budget to provide ongoing training on the latest IT developments for staff at all organizational levels, ranging from operational to strategic" (p. 19). They encourage further research to investigate what they term as "overall IT proficiency", an area which researchers have failed to explore, so far, mostly as a result of lack of access to explicit financial data IT Budget (Law et al. 2013).

Nonetheless, the hotel sector has established performance measures that are mostly financial; gross operating revenues (GOR), gross operating profit (GOP) and earnings before interest, tax deduction and amortisation (EBITDA), average daily rate (ADR), demand (occupancy) and revenue dynamics (RevPAR), (Enz 2003; Cruz 2007; Sunny et al. 2005). These are, however, not the only measure of performance and Haktanir and Harris (2005) propose employee performance, customer satisfaction, financial performance, and innovative activities as more comprehensive performance measures. They concede, however that "the financial measures are used to a large extent for measuring the performance of the hotel," but that "employees performance measurement is directly related guest satisfaction measures" (p. 49). Therefore, the over-arching research aim of this paper is to examine the inter-relationship between the PMS and the role of training and hotel performance.

3 Methodology

Prior to these in-depth interviews reported here, an online questionnaire was used to collect the data from a large geographically spread population of mid and upscale hotels in Europe, Middle East and Africa (EMEA). The questionnaire consisted of 18 questions which ask for demographic data, financial performance indicators, IT metrics and specifically PMS training related questions. The follow up to this questionnaire is an in-depth examination via multiple in-depth interviews with front desk managers at midscale, 50–150 rooms, independent properties in Switzerland. The selection of in-depth interviewees provides a particularly suitable research environment as it focuses particularly on the Swiss sector and more specifically on the front desk manager, identified as critical in earlier stages of this research project. The interviews were semi-structured and grouped in

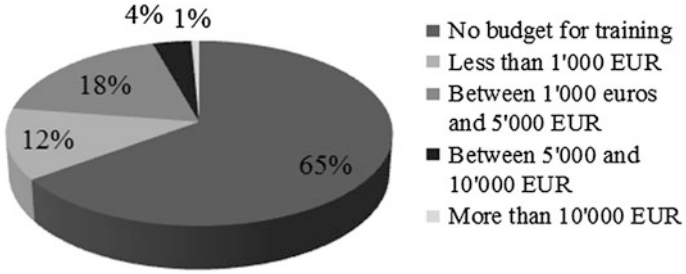

Fig. 1 Budget for training on PMS

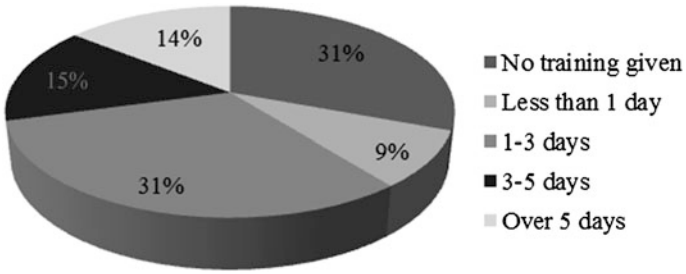

Fig. 2 Training days on PMS

sections and include hotel demographics, hotel technology, PMS training and performance measures. Six front desk managers were individually interviewed in 1–2 h sessions, covering a variety of property types from 3 to 5 star and with between 50 and 100 rooms, located in Switzerland. Results presented are extracted from the questionnaire (in Figs. 1, 2 and Table 1) and then supported by excerpts from the interviews with front desk managers.

Table 1 Correlations between variables

	Revenues (GOR)	Training budget	Training days	Training provider
Revenues		0.320[a]	0.074	0.055
Training budget	0.320[a]		0.369[a]	0.554[a]
Training days	0.074	0.369[a]		0.295[a]
Training provider	0.055	0.554[a]	0.295[a]	

[a] Correlation is significant at the 0.01 level (2 tailed)

4 Results

From the quantitative data, it is clear that little time or money is spent on training with 65 % having no budget. There is significant correlation between training budget and hotel performance measured by GOR and with higher budgets the external training increases.

From the qualitative interviews, most participants were using a version of Micros Fidelio (e.g., Fidelio 8, Opera 5, Micros for FandB), and mostly on desktop applications. Most of the training is done internally, in house, and most likely by the front desk manager. In general, only the front desk staff is trained specifically on the system, thereby excluding all other staff. The cascading of knowledge is not viewed as efficient, much of the training is isolated, patchy and ineffective and un-related to performance. The following excerpts from interviews are reported under the headings; training, performance measures and barriers.

Training. The offering, timing, mode and depth of the training are not seen as useful:

- *"…not so effective because the Manager trains the assistant, who trains the receptionists, who train the new receptionist…loss of information."*
- *"…it is not useful… [but] for the 2 weeks in-house training, it works very well…"*
- *"Training on-the-job is difficult because you are always busy with phone calls, guests etc. at the front office."*

Performance Measurement. Performance measurement is investigated under three classifications, financial, customer satisfaction and employee. It is clear that financial and customer satisfaction is measured but only one of the properties measure employee performance and in none of these cases is it related to training:

- *"ADR, Occupancy and RevPar for Reception. For the whole hotel: GOP. But it is really a mix of the cost and the total sales that matter."*
- *"Gross Revenue; ADR (need to be kept high); Occupancy; RevPar, but not related to individual."*
- *"Staff is not rewarded according to guest satisfaction. Employee performance will may be measured next year."*
- *"If we receive a good comment about a member of the staff, it is communicated to the staff. No other reward for this."*
- *"Social Media: one person responsible of PR and GM assistant: she surveys the social media, updating FB page, replying to customers, etc."*
- *"Questionnaire in the room."*
- *"Emails sent to the guests 2–3 days after their stay."*
- *"Employee performance review twice a year with the managers (one-to-one). We also measure employee satisfaction (Futuris—software) and efficiency."*
- *"…rankings for the hotels (but no reward system in place)."*

Barriers. The interviews reveal that there are two major barriers to training and information sharing. These are consistency of data entry and prioritising data access:

- *"F&B, we do not have the same priorities."*
- *"Different ways to enter info on the PMS for different departments."*
- *"…housekeeping or F&B does not know where to look for the info because they are not trained properly probably."*
- *"…try to establish some limits and some rules about entering the information."*

5 Discussion, Implications and Limitations

These results show barriers exist that inhibit the optimal use of the PMS. There is inadequate training for the employees, insufficient sharing of the information and no linkage to performance measures or rewards. Those that do invest in training days and budget appear to reap the rewards in terms of revenues. When a cluster analysis is conducted, the cluster of hotels which offered training to their employees through a combination of internal and PMS supplier training and those that have a substantial amount of budget allocated and more days training had the highest average occupancy levels. Of course, this could be attributed external factors. The structure of the hotel itself determines somewhat the management capacity; the exploitation of technology, training and development and cross functional data sharing. These are traditional Swiss hotels that tend to rely on hierarchical structures, which may explain the training issues.

Most of the hotels use a version of Micros and this may exacerbate the lack of knowledge-sharing and data. As the systems improve (and cost more), supplier training is sacrificed. The fact that the PMS is in a fixed location (i.e., desktop), may further exacerbate the knowledge sharing. The 'in house' transfer of skills has implications in cases where the internal trainer is neither fully informed of the full training process nor motivated to share a skill set. Additionally, internal training by colleagues limits training to what is remembered/recalled and rarely covers a sufficient knowledge of the complete functionality of the PMS. There is no company ownership of the PMS so "buy-in" from other departments is low and the PMS is seen as the domain of the front desk personnel. Frequently, front desk operators are part-time and entry positions, thus, subject to higher rates of turnover and thus skill depletion. However, even these properties that invest in training do not fully exploit all their technology assets towards their strategic goals.

The limitations of this quantitative approach are the small sample size of the interviews, the specific nature of Swiss hotels and the bias of the interview subjects and variable interpretation of the data. However, this is part of a wider research project and further investigation of the constructs is planned.

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Sharing Internship Experience on the Internet: A Study of Tourism and Hotel Management College Students

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Abstract The major objective of the current research is to compare the use of two online media, namely online-personal (platforms for communicating with someone the senders know like email and social networking sites) and online-collective (platforms for communicating with someone unknown to the senders like weblogs and Internet forums) for sharing internship experience by the tourism and hotel management college students. This study also investigates whether the use of these media vary with gender and Internet usage. Drawing on the findings from a self-administered survey with tourism and hotel management college students in a Hong Kong university, this study reveals that respondents are more likely to use online-personal media than online-collective media. Online-collective media are also found to be prevalent among males. While knowledge about interns' experience is paramount for the improvement of internship program, internship officers and industry practitioners are recommended to ask interns to provide social networking site accounts.

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1 Introduction

The Internet is presently a major vehicle for people to communicate and disseminate information (Law et al. 2010). In addition to the conventional online media like websites and emails, social media such as Facebook, Twitter, YouTube, Google+, and others are increasingly adopted by users to disseminate opinions, knowledge, and personal experiences (Sun et al. 2006). These online media allow Internet users to expose their contents to a large pool of audiences encompassing family members, friends, acquaintances, and even strangers. However, it is not necessary that users will make use of every online medium to disseminate information. Their likelihood of using various kinds of online media to disseminate information may be different because some media (e.g., Facebook) offer more convenience to reach friends in the social circle; whereas others are good for reaching unknown persons (e.g., Internet forum). This postulation, which has not been examined to the best of our knowledge, is the void that this research aims to fill in.

Information being shared online can be in a variety of forms like ideas, personal experiences, and expertise (Wang and Noe 2010). Personal experience is a form that has received vast scholarly attention (Chu and Kim 2011; Hennig-Thurau et al. 2004; Litvin et al. 2008), which in turn implies the importance of understanding online sharing of personal experience. However, to date, no prior study has been conducted to understand college students' internship experience sharing behaviour on the Internet. Internship, as a major component in many academic programs, has been emphasized for its importance by academicians, industry practitioners, and students. To generate the best outcomes of an internship program, internship officers and industry practitioners are necessitated to understand interns' reflections of their experiences (Fong et al. 2013). Following this rationale, it is vital to know which platforms interns most likely to share their experiences, especially in the online environment where college students' imprint prevails (Gemmill and Peterson 2006; Niemz et al. 2005). However, relevant implications appear nonexistent in the literature, which offers rooms for the pursuance of this study.

The participants of this study were solicited from a tourism and hotel management program because it is one of the academic programs that consider internship an essential component of the curriculum (Beggs et al. 2008). Based on the above observations, the primary objective of this study is to compare tourism and hotel management college students' likelihood of sharing internship experience on different online media. To enrich our findings and provide more insights on the planning work of internship program, this research also investigates whether the likelihood of sharing internship experience on these online media varies with gender and Internet usage.

2 Theory

2.1 Online Information Dissemination Media

Since the introduction of the Internet to commercial use in the early 1990s (Law et al. 2010), a variety of online media, such as emails, Internet forums, weblogs, social networking sites and others, have emerged to facilitate interpersonal communications. Given the wide variety of online media, a synthesis of the common characteristics of these media should be beneficial for the pursuit of scholarly research. In this regard, Fong et al. (2013) proposed three types of online information sources namely online-personal, online-collective, and online-company. Online-personal refers to the information sources involving personal communications, such as email and social networking sites. Online-collective refers to the third-party media where information is openly accessed, for examples, online newspaper, online magazines, weblogs, and Internet forums. Online-company specifically denotes the company website and is similar to online-collective in the sense that information is open to the general public. Although these categories were developed for application to the context of online information search, they provide certain insights on online information dissemination. In the online-personal media, the receivers (e.g., friends on social networking sites) should be known to the senders, whereas in both online-collective and online-company media, the receivers (e.g., the general public) are unknown to the senders. Following this rationale, the current research categorises the online information dissemination media into online-personal media and online-collective media. Online-personal media represent the online information dissemination media that receivers are known to the senders. Online-collective media refer to the online information dissemination media that receivers are unknown to the senders.

2.2 Factors Affecting Information Dissemination Behaviour

As suggested in the Introduction section, people's likelihood of using the various kinds of online media to disseminate information varies according to their relationship with receivers. In this regard, social ties, which refer to the social relationship between the sender and receiver (Brown and Reingen 1987), should play a crucial role in determining whether information is disseminated via online-personal or online-collective media. The concept of social ties has been studied in a wide range of contexts such as consumers' word of mouth (Chu and Kim 2011), choice of mobile networks (Suarez 2005), job search (Montgomery 1992), and communications of safe sex (Boer and Westhoff 2006). Social ties are commonly explained by their strength such as strong ties and weak ties (Granovetter 1973). Strong ties are typically manifested by close friends and family members, whereas weak ties normally refer to acquaintances and strangers (Mack et al. 2008). As interactions are more readily available and frequent in strong ties, the likelihood of

information dissemination is higher in strong ties than weak ties (Brown and Reingen 1987; Lai and Wong 2002; Weenig and Midden 1991).

Being closely related to social ties, homophily may also explain information dissemination via online-personal and online-collective media. Homophily refers to the degree of "similarity on various attributes among persons who affiliate with each other" (Kandel 1978, p. 427). According to the homophily (or like-me) principle, interpersonal interactions tend to occur among people who are similar to each other in various attributes (Lin et al. 1981; McPherson et al. 2001). For instance, people working together or having a similar job nature tend to have common perspectives over the issues, which, in turn, facilitates interaction (Alderfer 1987). Homophilous individuals are easier to cultivate trust among themselves, which also promotes information exchange (Chu and Kim 2011). While some scholars considered homophily and strong ties synonymous, others treated them as independent notions (Brown and Reingen 1987). Irrespective of how the scholars consider these two concepts, they tend to agree that strong tie networks are characterised by homophilous individuals (Granovetter 1973; Ruef et al. 2003). In contrast, weak tie networks tend to be heterophilous (Lin et al. 1985). Based on these observations, it is plausible that information dissemination is more likely to happen in strong ties where homophily prevails than weak ties where heterophily is salient.

Discussions about information dissemination have also related strong ties and homophily to self-categorisation (Lai and Wong 2002). According to the self-categorisation theory (Turner et al. 1987), an individual considers him/herself from the perspective of a group that he/she belongs to, whilst he/she accentuates the similarities among the in-group members and the distinctions from the out-group members. In this regard, individual goes through a depersonalisation process so that the self is defined as an in-group membership. While self-interest is prioritised by most (if not all) people (Miller 1999), it becomes natural for a person to consider in-group interests ahead of out-group interests (Terry et al. 2001; Yamagishi and Mifune 2008). Following that, sharing of information should be more likely inside the group, characterising by strong ties and homophilous members (Lai and Wong 2002). The above discussions commonly indicate that strong ties (e.g., friends and family members) are more likely to activate information dissemination than weak ties (e.g., acquaintances and strangers). This argument perhaps can be extended to explicate the likelihood of using online-personal and online-collective media to disseminate information.

While social network theory (e.g., social ties) and social categorisation theory provide theoretical support for prevalence of online-personal and online-collective media, research on opinion leaders and opinion seekers accentuates the critical role of expertise in information dissemination (Alba and Hutchinson 1987; Lee et al. 2011). Given wisdom of crowds and collective intelligence (Golub and Jackson 2010; Gruber 2008), it is reasonable to believe that online-collective media carry higher expertise than online-personal one. As no empirical research is found on this potential contradictory effect on information dissemination between social ties and expertise, the following hypothesis can be formulated in favour of social ties over expertise:

Hypothesis 1 Online-personal media are more likely to be used by tourism and hotel management college students to share internship experience than online-collective media.

Using a particular medium to share internship experience is a human decision. Owing to the different cognitive functions between males and females (Everhart et al. 2001; Lenroot and Giedd 2010), decision making often varies with gender (Kim et al. 2007b). In this regard, gender effect on the use of online media seems plausible. Previous research revealed that males have stronger motivation to adopt new technology and higher Internet usage frequency than females (Jackson et al. 2001; Teo et al. 1999; Tsai and Tsai 2010), implying that males are more active in pursuing online activities. However, as there are a wide variety of online activities (e.g., browsing, downloading, purchasing, communication, information search, and others), gender differences do not necessarily exist in all kinds of online activities while female can be more active in certain activities (Akman and Mishra 2010; Teo and Lim 2000). In online communication, for instance, no gender difference was found in previous studies (Teo and Lim 2000; Thayer and Sukanya 2006; Valkenburg and Peter 2007).

Although online communication does not differ between males and females, the strength of social ties that males and females have may be different. According to Ibarra (1997), females tend to have more strong tie networks than males given that women emphasise the maintenance of close relationships. Similar insights were found in the online environment, females tend to use the Internet to maintain existing relationships; whereas males tend to use it for developing new relationships (Sheldon 2008). Following this rationale, it is possible that females are more likely to share information within the strong tie networks where close relationships prevail than males. Accordingly, males may be more likely to share information within weak tie networks where interpersonal relationships tend to be distant than their female counterparts. As this study manifests strong ties with online-personal media and weak ties with online-collective media, the following hypotheses are proposed:

Hypothesis 2 When sharing internship experience, female tourism and hotel management college students are more likely to use online-personal media than their male counterparts.

Hypothesis 3 When sharing internship experience, male tourism and hotel management college students are more likely to use online-collective media than their female counterparts.

While the concern of this study is about the use of online media, Internet usage appears to be a relevant predictor. Indeed, if an individual is unfamiliar with Internet technology, it is unlikely for him/her to use the technology (Kim et al. 2007a). Therefore, Sun et al. (2006) argued that Internet experience helps promote spread of online word-of-mouth. Moreover, a previous study revealed that high Internet usage leads to more online communications (Thayer and Sukanya 2006). Following these findings, it is plausible to assume that people with higher Internet

usage will have higher propensities to share their experience online. As a result, the following hypotheses are suggested:

Hypothesis 4 When sharing internship experience, tourism and hotel management college students with high Internet usage are more likely to use online-personal media than their low Internet usage counterparts.

Hypothesis 5 When sharing internship experience, tourism and hotel management college students with high Internet usage are more likely to use online-collective media than their low Internet usage counterparts.

3 Methods

3.1 Participants and Procedures

In this study, participants were solicited from a major hotel and tourism management program in a Hong Kong university. The target respondents were undergraduate students who had had internship experience and their participation was voluntary. An online survey was adopted to collect data and a structured questionnaire was designed. To ensure the content adequacy of the instrument, six research students had a review on it in early January 2013. Subsequently, the authors refined the questionnaire based on the received comments and conducted a pilot test with 52 undergraduate students by mid-January 2013. There were totally 11 completed questionnaires and no comment on further improvement of the instrument has been received. The main survey was conducted from February 21, 2013 to April 18, 2013. Reminders were delivered to the students on March 7, 2013 and March 21, 2013. Among the 607 target respondents, 52 of them have completed the questionnaire and it was their first time to fill in the questionnaire.

3.2 Instrument

The questionnaire comprises two sections. The first section measures the participants' likelihood of using online-personal and online-collective media to share their internship experience in 7-point Likert Scale (1 represents "very unlikely" and 7 represents "very likely"). Explanations of online-personal and online-collective media are provided for the respondents. An option of "not applicable" is also provided for each medium. The second section is for gathering the data regarding respondents' gender and the number of hours they spent on Internet per week. Following Assael's (2005) approach, respondents using the Internet for 20 h or below are classified as low usage users, whereas those with usage hours above 20 represents high usage users.

3.3 Data Analysis

Given the low response rate (52/607: 8.6 %), non-response bias is of concern. To address this concern, comparisons of the responses on all items in the questionnaire were conducted between the first one-third and the last one-third of the responses (17 each and totally 34 responses) (Armstrong and Overton 1977; Theodosiou and Katsikea 2012). The early responses were all prior to the first reminder, whereas the late responses were all after the second reminder. In view of the small group sample size ($n < 30$), *Mann–Whitney Tests* using the *Exact* test method were adopted to pursue the comparisons (Field 2009). No significant difference was found for both online-personal media ($U = 142.50, Z = -0.07, ns$) and online-collective media ($U = 110.50, Z = -1.12, ns$). To assess the non-response bias of gender and Internet usage, Chi square test was used with *Fisher's exact test* method because there are expected cell counts with values below five (Field 2009). No significant difference was found ($\chi^2 = 3.33, n = 34, ns$). Based on these statistical results, non-existence of non-response bias can be deemed.

Before testing the hypotheses, identification of outliers and checking of data normality for the likelihood of use of online-personal and online-collective media were pursued. No outlier was found as all z-values are within ± 2.5 (Mertler and Vannatta 2010). However, the data do not follow normal distribution as their Kolmogorov-Smirnov statistics are significant [$D(51) = 0.23$, $p < 0.001$ for online-personal data; $D(51) = 0.17$, $p < 0.01$ for online-collective data]. Thus, we used non-parametric tests including *Wilcoxon Signed Rank Test* to examine hypothesis 1 and *Mann–Whitney Tests* to examine hypotheses 2 through 5. To deal with the missing values, pairwise deletion was used.

4 Results and Discussions

4.1 Comparison Between Online-Personal and Online-Collective Media

The respondent who selected "not applicable" for both use of online-personal and online-collective media was excluded from the analyses and thus 51 respondents were used to examine hypothesis 1. The results of *Wilcoxon Signed Rank Test* attest that participated students' likelihood of using online-personal media ($M = 4.98$, $Mdn = 5.00$) is significantly higher than that of online-collective media ($M = 4.31$, $Mdn = 5.00$) ($Z = -3.03$, $p < 0.01$). Hence, hypothesis 1 is supported.

Table 1 Differences in the likelihood of using online media to share internship experience by gender

	Male ($n = 8$)	Female ($n = 41$)	U	Z	p-value
Online-personal					
Mean (*standard deviation*)	4.88 (*1.36*)	4.95 (*1.36*)			
Median	5.00	5.00	158.00	−0.17	0.443
Online-collective					
Mean (*standard deviation*)	5.25 (*0.89*)	4.12 (*1.63*)			
Median	5.50	4.00	94.00	−1.93	0.028

Note The results are derived from the *Mann–Whitney Test* using *Exact* test method

4.2 Gender Effects on Online-Personal and Online-Collective Media

Three respondents did not indicate their gender and thus 49 samples were used to test hypotheses 2 and 3. There are eight male and 41 female respondents. This mixture is coherent with the typical gender distribution of tourism and hotel management program in which female dominates the student population (King et al. 2003). While the *Mann–Whitney Test* was used, *Exact* test method was adopted given the small sample size of male students. Table 1 shows the results of the tests. The difference in the likelihood of using online-personal media to share internship experience between male ($M = 4.88$, $Mdn = 5.00$) and female students ($M = 4.95$, $Mdn = 5.00$) is not significant ($U = 158.00$, $Z = -0.17$, *ns*). Thus, hypothesis 2 is not supported. However, male students ($M = 5.25$, $\underline{Mdn} = 5.50$) have a significantly higher likelihood of using online-collective media to share internship experience than their female counterparts ($M = 4.12$, $Mdn = 4.00$) ($U = 94.00$, $Z = -1.93$, $p < 0.05$). Therefore, hypothesis 3 is supported.

4.3 Internet Usage Effects on Online-Personal and Online-Collective Media

In view of the small sample size, the *Mann–Whitney Test* with *Exact* test method was used to examine hypotheses 4 and 5. Contrary to our conjectures, as shown in Table 2, no significant difference was found between high and low Internet usage participants for both online-personal (high usage: $M = 5.21$, $Mdn = 5.00$; low usage: $M = 4.68$, $Mdn = 5.00$; $U = 254.00$, $Z = -1.28$, *ns*) and online-collective media (high usage: $M = 4.28$, $Mdn = 5.00$; low usage: $M = 4.36$, $Mdn = 4.00$; $U = 314.50$, $Z = -0.09$, *ns*).

Table 2 Differences in the likelihood of use of online media to share internship experience by Internet usage

	High usage ($n = 29$)	Low usage ($n = 22$)	U	Z	p-value
Online-personal					
Mean (standard deviation)	5.21 (1.24)	4.68 (1.46)			
Median	5.00	5.00	254.00	−1.28	0.103
Online-collective					
Mean (standard deviation)	4.28 (1.53)	4.36 (1.79)			
Median	5.00	4.00	314.50	−0.09	0.468

Note The results are derived from the *Mann–Whitney Test* using *Exact* test method

4.4 Discussions

Echoing our argument underpinning hypothesis 1, online-personal media (e.g., friends and family members), which is characterised by a stronger tie than the online-collective one (e.g., general public), is more likely to be used by tourism and hotel management college students to share their internship experience. The findings can be addressed to the homophily (or like-me) principle (Lin et al. 1981; McPherson et al. 2001). The online-personal media provide a venue for interns to share their experiences with their classmates who had internship at the same period of time or will have internship in the upcoming period (i.e., having internship as a homophilous attribute). Such a phenomenon is particularly salient in the strong tie network. Moreover, since the participated students are primarily Asians, their general inclinations toward collectivism may enhance their support of in-group interest (Triandis et al. 1988; Wagner III 1995), which in turn promotes their experience sharing behaviour within the strong tie and homophilous network.

In an earlier section, we argued that social ties underscore the gender effects on the use of online media. Our argument was partially supported in this study as hypothesis 3 was confirmed but not for hypothesis 2. As males are fond of developing new relationships in the online environment (Sheldon 2008), it is not surprising that male tourism and hotel management college students are more willing to share their internship experience in the weak tie networks (e.g., online-collective media where the recipients are primarily strangers) than their female counterparts. Additionally, lower risk-taking propensity of females (Byrnes et al. 1999) may hinder their willingness to share information with strangers (general public in this study), in which more uncertainty is generally expected. Although we assumed that strong tie networks favour females' sharing behaviour, the results show that male and female students are equally likely to share internship experience via online-personal media. The findings concur with the non-existence of gender effects on online communication with known persons in previous studies (Teo and Lim 2000; Thayer and Sukanya 2006; Valkenburg and Peter 2007).

Although we hypothesized that sharing internship experience via online-personal and online-collective media vary with Internet usage, no difference was revealed between high and low Internet usage groups in our study. The results infer that Internet usage and familiarity are unable to explain online information sharing.

5 Conclusions

The findings of this study show that tourism and hotel management college students were more likely to share their internship experience via online-personal media than online-collective media. While male interns were more likely to share their experiences via online-collective media than their female counterparts, no gender effect was found on online-personal media. Moreover, contrary to our predictions grounded in the existing literature, high and low Internet usage interns were equally likely to share their experience through online-personal and online-collective media. Given that online-personal media are characterised by strong tie networks (e.g., friends and family members) and online-collective media by weak tie networks (e.g., general public), our findings imply that the strength of social ties is of major concern in internship experience sharing.

To fill in a void in the literature, this study introduces online-personal and online-collective as media for information dissemination and compares the likelihood of the use of these two online media in an unexplored context namely internship experience sharing. According to the research findings, students tended to share their internship experience through online-personal media like social networking sites (e.g., Facebook, Twitter, and others). Considering information on these platforms may provide internship officers and hoteliers with clues on what they have to improve in the internship program as well as hotel operation, internship officers may consider connecting with students via social networking sites prior to the commencement of internship. Through observing and analyzing students' feedback shared on these platforms throughout their internship, internship officers may identify the areas of improvement and even offer prompt remedies. Also, industry practitioners may understand the area of improvement in the hotel operation according to the students' feedback.

A major limitation of this study is the small sample size. However, as non-response bias did not exist in our samples, the concern on the limited representativeness of small samples can be mitigated. Although the data were collected in a major tourism and hotel management program in Hong Kong, generalisability of the findings are unsure, in particular that the number of male respondents is small. Future research may replicate the studies in other programs and countries, and if possible, have a less uneven mixture of male and female respondents. While we argued that strengths of social ties, homophily, and self-categorisation are the possible underlying rationales of the use of online-personal and online-collective,

future studies may have a further examination on the arguments. Also, toward the building of theory, replicating the research in a context other than internship experience sharing should be worthwhile.

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Part XI
Distribution and Decision Support Systems

Substitution Effects Across Hotel Distribution Channels

Roland Schegg and Miriam Scaglione

Abstract The evolution of distribution channels in the hospitality sector has followed different paths over time depending on the technology used. This research analyses the evolution of market shares of different clusters or generations of distribution channels using multi-generation diffusion methods. The data for the study are a series of annual member surveys by Hotelleriesuisse since 2002 which monitored the evolution of market shares of 15 individual distribution channels. We grouped the distribution channels into three generations starting with the pre-World-Wide-Web era; the middle generation comprises Internet-based direct booking channels and the latest generation includes online intermediaries such as Online Travel Agencies and social media. The results of our analysis show substitution effects across different clusters of distribution channels and shed light on the dynamics of competing sales funnels. From the practitioner's point of view, the study gives insight into the future evolution of the distribution mix. This evolution is crucial for hotel marketing strategies as the Internet is the most powerful marketing tool in the hospitality industry today.

Keywords Hotel · Distribution · OTA · Switzerland · Fisher-pry model · Substitution effects

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1 Introduction

Information and communication technologies (ICTs) have been recognized for quite some time (cf. Buhalis 2003, p. 338) as a key tool for marketing and distribution in tourism. Actually, not only do they offer opportunities in terms of information diffusion (24 × 7 × 365) on product and service presentation, pricing strategies and promotions (last minute, location-based offers, etc.), but also they broaden selling opportunities for tourism suppliers including getting customer feedback from social media sites.

ICTs have been changing the way in which business is conducted in the tourism and hospitality industry (e.g. Buhalis and Law 2008; O'Connor and Frew 2002) since the 1970s: the development of Computer Reservation Systems (CRS—1970s), Global Distribution Systems (GDS—1980s), and the advent of the Internet (1990s) generated not only a paradigm shift but an actual change in operational practices in the industry (Buhalis and Law 2008; Ip et al. 2011).

Yet, in spite of the potential that the Internet provides, it has been mainly exploited, already in an early stage, by big international brands (O'Connor and Frew 2002); whereas many small and medium-sized enterprises (SME) in the hotel sector are challenged by the vast amount of opportunities and the variety of alternative distribution systems (Toh et al. 2011).

From an industry perspective tourism managers understand that the Internet can give tremendous added value to their businesses at both the marketing and the sales level (Buhalis 2003; Werthner and Klein 1999) if they manage it properly and professionally. But even if the rising importance of online distribution channels in tourism is recognized nowadays (Li et al. 2009), many (Swiss) hotels still do not fully exploit their own websites (Scaglione et al. 2009; Schegg et al. 2007) as a tool for selling hotel rooms and as a way to gain a competitive advantage (Law and Jogaratnam 2005).

The steadily increasing complexity with regards to managing the online distribution environment (Kracht and Wang 2010, p. 736) seems to be a challenge for the whole industry, but small and medium tourism enterprises (SMTEs) in particular struggle with aspects such as learning and adopting new technology (Scott et al. 2010), globalisation and increasing competition (Stratigea and Giaoutzi 2006). Consequently, many hotels rely increasingly on third-party websites (intermediaries such as online travel agencies, OTAs) which allow users to compare different products across multiple suppliers (Rao and Smith 2006).

According to Kracht and Wang (2010, p. 737), "this evolution and transformation of tourism distribution channels resulted in greater choice for the consumer, increased competition for distribution participants". The authors further state that ICTs have introduced complexity to the distribution system with various permutations such as additional layers of intermediation or disintermediation when certain players bypass traditional intermediaries. Yet, there is still little research—with the exception of the work by O'Connor and Frew (2002)—looking at the evolution and the future market share of (online) distribution channels. The aim of

this research is thus to model the substitution effects across different clusters of distribution channels in the Swiss hotel sector and thus gain an understanding of the dynamics of competing sales funnels.

2 Literature Review

2.1 The Rise of Online Distribution for Hotels

Hotels have traditionally used a large variety of distribution channels (Christodoulidou et al. 2010). Direct hotel-owned sales channels include telephone, fax, walk-ins, and, since the development of the Internet in the 1990s also e-mail, web forms and real-time booking on the hotel website. In addition to direct sales, hotels use an array of various intermediaries including traditional brick-and-mortar partners such as travel agents, tour operators or destination management organisations, affiliation partners (e.g., hotel franchises) and in recent years more and more online intermediaries such as OTAs.

Online distribution was seen as a promising progressive shift away from traditional sales channels such as mail, telephone and fax (Kasavana and Singh 2002; O'Connor and Frew 2002) because traditional channels are seen as inefficient and expensive by both hoteliers and final customers (O'Connor 2001). Starkov and Price (2007) recorded that two out of three reservations were completely made online (i.e. search, book, pay directly online) or were influenced by the Web (i.e. web search and actual reservation through other channels such as the phone). An investigation by TravelCLICK (2009) of thirty international major brands and chains showed that 48 % of hotel reservations were made over the Internet; 27 % were made by brick-and-mortar travel agents: and 25 % were made by voice (e.g., telephone and/or walk-ins).

An analysis by Schegg et al. (2013) showed that direct booking channels remain the dominant sales tools in Switzerland, although their proportion in the distribution mix has been decreasing steadily over the last 10 years in favour of online intermediaries. The rise of electronic channels has been paralleled by a decline in the market share of the classical intermediaries (DMOs, tour operators, travel agents, event organizers). Such an evolution was predicted by several authors in the past (e.g. Kasavana and Singh 2002; O'Connor and Frew 2002) and given the dynamics of the market place, it seems to be important to examine and understand the evolution of hotel distribution over the long-term in order to foresee future development.

2.2 Evolution of Distribution Channels

A recent review paper by Kracht and Wang (2010) examined the historical evolution and progression of distribution channels in the tourism sector. The study focused on the evolution of the structure over time revealing the progressively larger number of intermediation layers, in spite of concurrent disintermediation and re-intermediation activity. The authors structured distribution channels into three different generations setting 1993 as a milestone, owing to the introduction of the web browser into the marketplace which enabled direct communication between suppliers and consumers:

1. The first generation channels emerged in the pre-World-Wide-Web era, before 1993 and are composed of traditional retail and traditional corporate travel agents, traditional tour operators, Global Distribution Systems (GDSs), incoming travel agents, switches, destination marketing and destination marketing organizations (DMOs) and suppliers (op. cit. cf., p. 739).
2. The second generation channels developed after the communication protocol of the World Wide Web had been made freely available in 1993. Suppliers began to connect directly with customers through web-mediated channels (op. cit. cf., p. 741) and thus began the disintermediation of traditional intermediaries. This second generation is characterized by the growing importance of new direct communication/distribution channels such as e-mail, online booking forms or internet booking engines on the website of the hotels.
3. According to Kracht and Wang (2010), slightly after the time that suppliers started disintermediating traditional intermediaries, another layer of intermediation began to develop based on the growing importance of internet search engines such as Google and Yahoo. The first Online Travel Agencies (OTAs) were Internet Travel Network (ITN) in 1995, Travelocity in 1996 and Priceline (one of the dominant players in today's market place) in 1998 (op. cit. cf, p 741). OTAs with sound business models survived the internet bubble of 2000 and saw increasing market success thereafter.

According to Christodoulidou et al. (2010), travel meta search engines such as Kayak, SideStep (now owned by Kayak), Mobissimo, and Trivago represent the next stage in how guests search and shop for travel. They state that "meta search engines differ from online travel intermediaries in that they do not process booking transactions—nor do they provide the full range of services and destination content typically found on an OTA site (p. 1049)".

2.3 Multi-Generation Diffusion Models

The aim of multi-generation simulations is to model the diffusion/substitution effects across several generations of technologies. In services, among other examples, researchers used these models in the simulation of successive generations of mobile

bands (Meade and Islam 2006, 2008) and the replacement of cash payment by electronic means in European countries (Snellman et al. 2001). There are two important effects to consider in multi-generation models: diffusion and substitution effects. Diffusion effects allow understanding the rationale of behaviour across adopters by showing the degree of imitation and innovation in diffusion processes following the traditional Bass diffusion model interpretation (Bass 1969; Mahajan et al. 1995). Substitution effects show the evolution of the share of each generation when it is replaced by a new one (Meade and Islam 2006).

One of the most popular models of substitution when the available data shows the market share of various product generations is the family based on the pioneering work by Fisher and Pry (1971).

The F–P model follows an S-shaped curve for each generation characterized by two constants: the early growth rate and the time at which the substitution is half complete as shown in Eq. 1 where f is the fraction substituted:

$$f = (1/2)[1 + \tanh \alpha(t - t_0)] \tag{1}$$

where α is half the annual fractional growth in early years and t_0 is the time at which the share of the generation is 50 %, namely when the substitution is half complete (cf. Fisher and Pry 1971, p. 76). The "takeover time" is the period necessary to go from the minimum time for the take-off (10 %) up to 90 % of the substitution.

Finally, an important concept is the "fractional rate of substitution of new for old generation" referring, for a given time t, to the ratio between penetration (f) over the remaining percentage ($1 - f$) to be substituted at time t. F–P assumes that this ratio is a linear function of time in a semi-log model that follows Eq. 2

$$\log[f/(1 - f)] = 2\alpha(t - t_0) \tag{2}$$

Therefore, the fractional growth or rate (2α) is constant throughout the whole substitution process. The F–P model is based on logistic growth (Bhargava 1995; Meade and Islam 2006). Bhargava (1995) proposed some extensions allowing the fractional growth of substitution (2α) to change over the time. He applied these models to the substitution of color TV for B&W in Japan, nylon tire cord for rayon tire cord in USA, synthetic for natural fiber also in USA. Equations 1 and 2 assume that there are only two generations (cf. Norton and Bass 1987) and all the applications in the literature are applied to this kind of setting.

3 Data and Methodology

Data utilised was gathered since 2002, on a nearly yearly basis, through online surveys completed by the over 2,000 members of *hotelleriesuisse* (Swiss hotel association; this is the main trade organisation of the hospitality sector in

Switzerland). The online questionnaire monitored how bookings are distributed among available direct (telephone, fax, walk-in, etc.) and indirect (tour operator, tourism office, GDS, OTA etc.) distribution channels; hoteliers specified how much each channel accounts for in percentages. Details on data collection and descriptive results are from our publication (Schegg and Fux 2010, 2013) and from the unpublished data of the last survey, conducted in January 2013.

Based on the distribution channel typology of Kracht and Wang (2010), we have aggregated the individual channels in the following way in order to analyse the evolution of market shares of successive distribution channel generations (see Table 1):

- Generation 1 (traditional channels): Telephone, fax, letter, travel agency, tour operator, DMO (local, regional or Swiss Tourism), conference organizers, CRS of hotel chain or franchisee, GDS, others.
- Generation 2 (online direct channels): E-mail, reservation form on website, real-time booking on the property website.
- Generation 3 (new online intermediaries): OTA, social media channel.

The time series covers 2002–2012 with three missing values (i.e. 2003, 2004 and 2007) when, unfortunately, the survey was not carried out. The authors estimated these values using exponential interpolation, namely semi-log regression model of the market share based on time (t). For the parameter estimation process, 2002 was labelled as being $t = 1$. Using Eq. 2 on time (t) the authors estimated the time series backwards for 11 years from 1990 to 2001 and forecasted 70 years from 2013 to 2060.

In order to model the substitution effect and given that the data are shares for each generation, the authors used the F–P model. They employed SAS V9.2 Nonlinear Least Square Proc Model procedure (SAS Institute Inc. 2011) for the estimation of the F–P model parameters α, namely half the annual fractional growth and t_0, the time where half substitution is reached.

Table 1 Evolution of mean market shares of distribution channel generations 1–3 between 2002 and 2012

Year (n = number of hotels participating in survey)	G1	G2	G3	Total
2002 (n = 202)	0.68	0.29	0.02	0.99
2003	–	–	–	–
2004	–	–	–	–
2005 (n = 94)	0.62	0.34	0.03	1.00
2006 (n = 100)	0.56	0.39	0.04	1.00
2007	–	–	–	–
2008 (n = 184)	0.55	0.40	0.06	1.00
2009 (n = 198)	0.49	0.40	0.11	1.00
2010 (n = 211)	0.46	0.41	0.14	1.00
2011 (n = 196)	0.46	0.37	0.17	1.00
2012 (n = 200)	0.42	0.37	0.21	1.00

Table 2 Goodness of fit—F–P model

Nonlinear 3SLS summary of residual errors				
Equation	SSE	MSE	Root MSE	R-Square
G1	0.00182	0.00018	0.01350	0.9759
G2	0.00737	0.00074	0.02720	0.4163
G3	0.00077	0.00008	0.00874	0.9822
Heteroscedasticity test (*White's test*)				
Equation	Statistic	DF	Pr > ChiSq	
G1	7.03	5	0.2184	
G2	6.79	4	0.1476	
G3	3.79	5	0.5795	
Normality Test (*Shapiro–Wilk W*)				
Equation	Value	Prob		
G1	0.93	0.3606		
G2	0.93	0.3939		
G3	0.85	0.0403		

Table 2 shows the goodness of fit to data of the model. The coefficients of determination (R2) are higher than 0.9 for the first and the third generations; whereas the second generation shows a rather poor coefficient of 0.42 indicating that the trend of this series has been moderately well captured by the model. White's test of heteroscedasticity of the residuals and the Normality test are not significant for every generation. An exception is the third generation (G3) where the Normality test is significant at $p < 0.05$. Therefore, the model shows, in general, a good fit to data.

4 Results

Table 3 shows the estimates of F–P parameters for the three distribution channel generations. The parameter 2α, which represents the annual fractional growth of each generation, is negative for the first generation (-0.11), which is in line with the fact that this generation is declining because it has been substituted by the two following ones. The same parameters for the second generation (0.04) are lower than those of the third generation (0.27); moreover annual fractional growth for the third generation is more than 6 times greater than the second (0.27/0.04).

Figure 1 illustrates the observed and simulated evolution of market shares for two distribution channel generations (G1 and G3): backcasted trend before 2002, observed trend between 2002 and 2012 and forecasted trend after 2012. Due to the rather poor goodness of fit of the model for the second generation, backcast and forecasts trends are not quite reliable, and therefore omitted in their long run in Fig. 1. The third generation shows a well-defined S-shape. As the first generation is declining, its curve shows a reversed S-shape.

Table 3 Estimates and t-statistics for F–P parameters and year represented by t_0

Nonlinear 3SLS estimates						
Model	Term	Estimate	Approx Std Err	t Value	Approx Pr > |t|	Estimate year f = 0.5
G1	2α	−0.107	0.003	−32.76	<0.0001	2009
	t_0	8.144	0.180	45.28	<0.0001	
G2	2α	0.041	0.008	5.16	0.0004	2021
	t_0	19.991	2.870	6.96	<0.0001	
G3	2α	0.275	0.011	25.08	<0.0001	2017
	t_0	15.862	0.331	47.87	<0.0001	

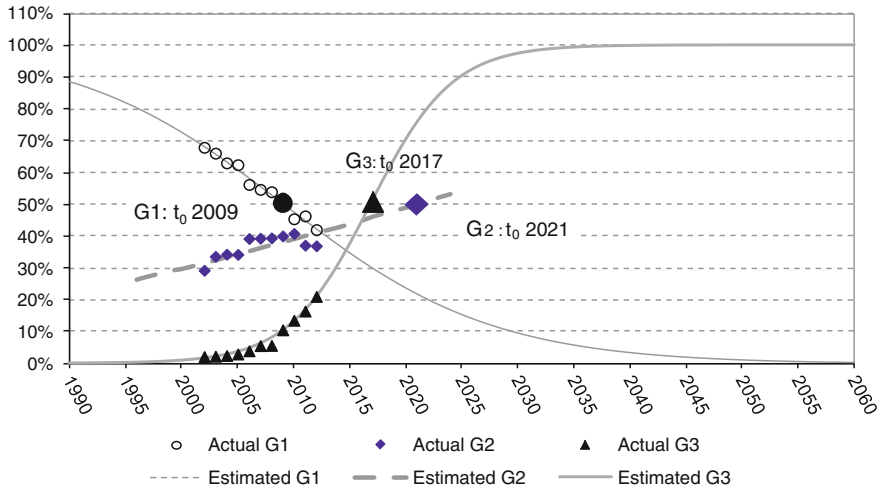

Fig. 1 Evolution of market shares for the 3 generations of distribution channels: observed (2002–2012), backcasted (1990–2012), and forecasted (2013–2060)

Moreover, the forecasted year when generation 3 reaches a market share of 50 % is 2019. For the first generation, the raw data (Table 1) show that in 2009 half of the share of the traditional channels (generation 1) had already been substituted by the two others (generation 2 = 40 % and generation 3 = 11 %) and so yields the model estimation.

Therefore, *ceteris paribus*, the third generation of channels will reach half of booking share by 2017 and in the long run dominate the booking channels. Of course the long- run forecast has to be taken with parsimony, as this is just a theoretical trend, which does not take into account the rise of possible forthcoming generations of distribution channels. It does, however, give some evidence of the domination of the last generation over the two previous ones.

5 Discussion and Conclusions

The growing power of OTAs and the possible dependency of hotels on them is a recurrent topic in the international hospitality industry. Electronic distribution systems have reached a state of rapid evolution since the emergence of web-based channels (Kang et al. 2007). According to these authors, multiple channel strategies in which suppliers use more than one distribution channel to serve the market have grown rapidly, because hotels are trying to maximize exposure and market share to fit the channel preference of their customers (Schoenbachler and Gordon 2002).

The technology refresh in the travel distribution landscape will probably continue at a rather rapid pace with the introduction of new platforms/channels and features that make legacy forbearers obsolete in the long run. Our forecasted evolution of generations of distribution channels will therefore be directly influenced/modified by the probable evolution of coming and new distribution models and actors. Google recently entered hotel search with its Google Hotel Finder. Facebook and other social media are becoming relevant platforms for exchange of travel information and recommendations, while the mobile channel is rapidly emerging with considerable potential. According to Green and Lomanno (2012, p. 2) "Hotels rooms are for sale in a dynamic and volatile distribution landscape that is launching many market savvy and financially well-endowed "gatekeepers" who will become a new breed of third party intermediaries (e.g., Google, Facebook, Apple); their power will grow as they gradually become the preferred points of entry for consumers to do travel shopping and buying."

In this context, the growing popularity of meta search travel sites such as Kayak, Trivago and TripAdvisor Meta Search, eased by the progresses in digital technology and customers' perceptions of these sites as "unbiased" online one-stop shops, is certainly a relevant development in travel distribution. While travel meta search engines are still in their early stage as a distribution channel, the major OTAs have recognised their strategic potential in the last 2 years. Expedia's acquisition of Trivago in 2012 (Shankman 2012), Priceline's acquisition of Kayak in 2013 (Schaal 2013a) and the launch of TripConnect by TripAdvisor enabling a vast long-tail of smaller properties to participate and vie for direct bookings rings in the next round in competition among global OTAs (Schaal 2013b).

In the Swiss hotel market, according to analysis (Schegg et al. 2013), market shares of the classical intermediaries (i.e. DMO, tour operators, travel agents) have been declining over the past years (reaching 12.5 % of all bookings in 2011 compared with 19 % in 2002). The sales channel with the highest growth rate is the OTA channel which was able to multiply its market share within the past five years according to these authors accounting now for nearly one out of five bookings (op. cit). The forecasted increasingly higher market shares of OTAs in our study are therefore a serious threat for the Swiss lodging sector. Online intermediaries have become progressively powerful and this development puts hotels in a difficult position of having to sell steadily growing portions of their

inventory at (often) discounted rates and with high commission rates through third party intermediaries (Caroll and Siguaw 2003).

According to Brewer et al. (2006) the growing importance of OTAs will result in hotels losing control of their (1) allotments, (2) marketing, (3) pricing, and it will lead to (4) hotel brand erosion. Hotels will need therefore to increase their competencies with respect to the use of the new media, e.g., online marketing, social media, and websites and strive for cost efficiency, for example by stimulating direct bookings (Schegg et al. 2013). But given the high marketing and technology investments of the OTAs (Toh et al. 2011) which are constantly looking to foster their oligopolistic position in the market, the chances of success of a direct distribution strategy seem to be scant for an industry which is characterised by small and medium-sized enterprises which are struggling to adopt new technology (Scott et al. 2010) and are operating with very limited resources both at a financial and at a human capital level (Schegg et al. 2013).

Limitations: Our results have to be taken with caution because there are still few observations available. The poorer performance of our model for the second generation is probably linked to the still short time series. Besides, the initial assumption of the F–P model is that the number of successive generations is only two. We are aware of that limit but the calculi show that the pace of substitution of the second generation is much lower than for the third generation anyway (cf. Fig. 1). Future research should use as raw data—not the market shares but the overnights—in order to be able to apply the Norton and Bass family of models and show some evidence of the rationale of customers' behaviour in terms of innovation and imitation.

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Online Auctions for Selling Accommodation Packages: A Readiness-Intensity-Impact Analysis

Matthias Fuchs, Wolfram Höpken, Alexander Eybl and Andreas Flöck

Abstract Since the advent of the Internet online auctions offer new opportunities to effectively sell also complex service products. Unsurprisingly, a small but constantly growing number of suppliers have recently started to successfully auction off travel and tourism products through online auction platforms, like eBay. However, so far, tourism research lacks adoption and impact studies concerning online auctions. Thus, the paper at hand, firstly, identifies the factors that determine the adoption of online auctions within the hotel sector. Secondly, by referring to Zhu and Kraemer, the proposed approach also elucidates how the use of online auctions affects hotel performance. Data gathered in the course of an online survey targeting the Austrian hotel sector is analysed by using the Partial Least Square (PLS) technique and logistic regression.

Keywords Online auctions · eBay · Readiness-intensity-impact analysis · PLS · Logistic regression

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1 Introduction

Historically, travel and tourism plays a leading role in adopting online sales and e-marketing applications (Werthner and Klein 1999; Gretzel and Fesenmaier 2001; Buhalis and Law 2008). However, as micro firms dominate the sector (e.g. 92 % of EU tourism firms employ <10 people), adoption rates vary enormously (E-Business Watch 2007). Nevertheless, due to high market potentials, and low entry and exit barriers, a growing number of tourism suppliers have recently started to sell travel and tourism services through online auction platforms, like eBay (Ho 2008; Fuchs et al. 2008; Fuchs et al. 2011). However, tourism research lacks adoption and impact studies concerning online auctions. Thus, exemplarily for the Austrian hotel sector, the aim of this paper is, (1) to identify the factors that facilitate adoption and use of online auctions, and (2) to tentatively estimate the impact of online auctions on firm performance. For this purpose, a questionnaire survey with hoteliers using online auctions (adopters) and those who do not (non-adopters) were carried out in 2009. The *Readiness-Intensity-Impact* framework based on Colecchia (1999) and Zhu and Kraemer (2005) is applied and tested through a Partial-Least Square model (Iacobucci 2010) and logistic regression (Hair et al. 2006).

2 Online Auctions in Tourism

Auctions provide effective mechanisms to dynamically adjust product prices to volatile market conditions. Since the advent of the Internet online auctions offer new opportunities, like reduced transaction costs for buyers and sellers, an increased pool of bidders through easy access and prolonged auctions, and the facilitation of complex auctions (Pinker et al. 2003, p. 1460). Additionally, online auctions serve as promotion channels and provide automatically collected bidding data. Thus, unsurprisingly, during the last 5 years the number of tourism products listed, e.g., at eBay Germany, has increased by 112 % (Fuchs et al. 2011, p. 1166). With 5 million visitors per month, eBay Germany lists more than 14,000 items in the 'short-term lodging category' (eBay Facts 2009). Moreover, compared to the average success rate of 46 %, eBay successfully sells 91 % of all listed vouchers for 2 persons and 2 nights in the 4-star hotel segment (Fuchs et al. 2011, p. 1171). However, the supply side is dominated by few sellers only (Ho 2008); e.g., 79 % of Austria's online auction market volume is shared among 6 dominant tourism suppliers (i.e., 10,886 out of 13,818 online auctions). Thus, it is crucial to elucidate related drivers behind technology acceptance and adoption mechanisms in the travel and tourism domain.

3 Literature Review and Research Framework

Adoption theories explain why individuals adopt and use (technological) innovations. *Technology Acceptance Models* (Davies 1989) state that the intention to adopt and use innovations is based on the perceived usefulness and the ease of using this innovation. According to Rogers' (2003) *Innovation Diffusion Theory* individuals will more likely adopt innovations that offer a relative advantage, compatibility, simplicity, trialability and observability. The *Unified Theory of Acceptance and Use of Technology* (Venkatesh et al. 2003) combines these theories and proposes performance and effort expectancy, social influence and facilitating conditions as key factors for use intention and usage rate of IT systems. By contrast, the *Technology-Organization-Environment* Framework stresses that the spread of technological innovations is determined by technological, organisational and environmental conditions (Zhu and Kraemer 2005).

While *adoption theories* explain the behaviour of individuals vis-à-vis (technological) innovations (micro), *technology diffusion studies* focus on the spread of new innovations through social systems and how long it takes until they are adopted by a certain number of people (macro). E.g. according to *Innovation Diffusion Theory,* by accumulating the number of adopters over time the position in the technology life cycle of a specific e-business application can be detected on the S-shaped diffusion curve. Thereby, at initial stages 'early adopters' typically request information about infrastructural conditions or use limitations. By contrast 'early majorities' are interested in usage figures on technological systems (benchmarks). Finally, 'late majorities' and 'laggards' ask for outcomes induced by e-business applications.

The below framework is based on Zhu and Kraemer (2005). *Technology-Organization-Environment* components refer to the adoption phase (readiness), while e-business adoption refers to the usage intensity. Finally, e-Business value creation refers to the area of e-Business impact (Fig. 1).

4 Model Building and Hypotheses

Readiness comprises the technical, economic and social infrastructure necessary for the adoption and use of e-Business applications, like online auctions (Colecchia 1999, p. 4). According to Thong (1999) and Ching and Ellis (2004), the proposed model is tested by considering a company and a wider system context (Fig. 2).

Organisational Context: ICT expertise comprises ICT-related competencies of managers and employees (Premkumar 2003; Hafeez et al. 2006) and experiences with online auctions, both in a business or private context. This leads to hypothesis H1: *The higher the level of ICT expertise*, *the more likely the adoption and the stronger the use of online auctions*. Costs related to online auctions consist of set up fees, regular fixed costs, a final value fee (i.e. a % of the final price) and the

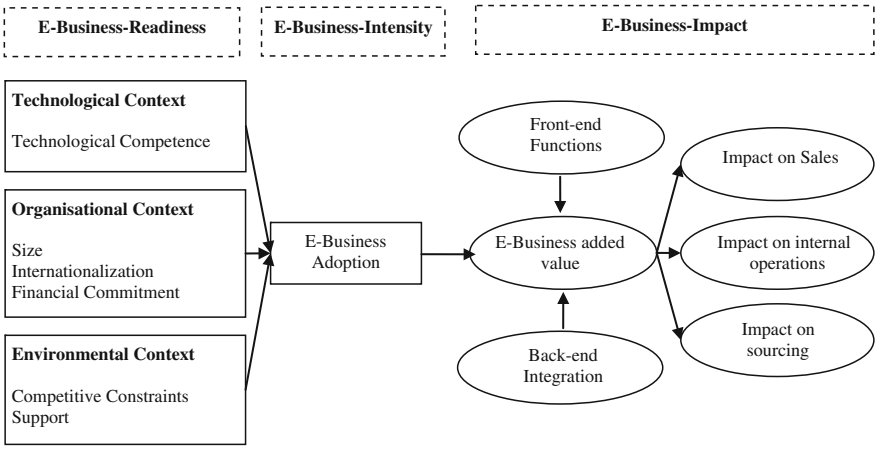

Fig. 1 Readiness-intensity-impact framework (*Source* adapted from Zhu and Kraemer 2005, p. 66)

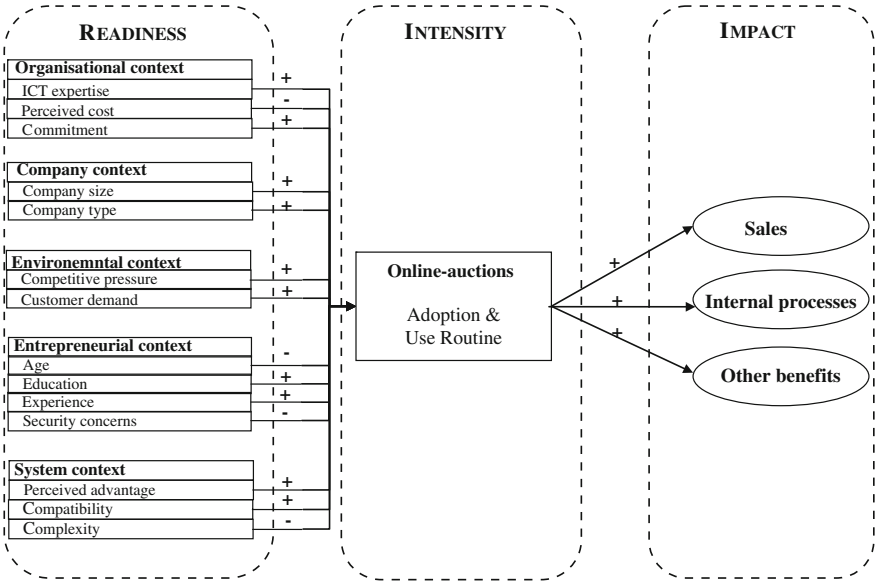

Fig. 2 Test model and hypotheses

amount of time invested to auction off hotel rooms (Walczuch et al. 2000). H2: *The lower the perceived costs of online auctions, the more likely the adoption and the stronger the use of online auctions*. The commitment of decision makers to online distribution is measured by the yearly budget for e-marketing and the attitude towards online distribution (Zhu and Kraemer 2005, p. 77). H3:

The stronger the commitment to online distribution, the more likely the adoption and the stronger the use of online auctions.

Company context: Although larger companies have more resources to experiment with new technologies, inertia and rigid decision structures may counteract the adoption of new technologies (Premkumar 2003). Hotel size is measured by the number of beds (Sahadev and Islam 2005), and hotels are classified by ownership (i.e., chain vs. family owned). H4: *The bigger a hotel, the more likely the adoption and the stronger the use of online auctions*. H5: *Hotel chains adopt online auctions more likely and use them more intensively*.

Environmental Context: Firms tend to adopt new technologies if they can expect a competitive advantage (Premkumar 2003). Competitive pressure is measured by the perceived necessity to use ICT to remain competitive and by the evaluation of how strong competitors are using online auctions. H6: *The higher the competitive pressure, the more likely the adoption and the stronger the use of online auctions.* Companies may adopt new ICT due to demanding customers (Wu et al. 2003): H7: *The more the management beliefs that customers demand online auctions, the more likely the adoption and the stronger the use of online auctions.*

Entrepreneurial Context: According to Grandon and Parson (2004) decision makers' characteristics are considered: H8: *The younger the decision maker, the more likely the adoption and the stronger the use of online auctions*. H9: *The higher the decision maker's formal education level, the more likely the adoption and the stronger the use of online auctions*. H10: *The longer the decision maker has led the firm, the more likely the adoption and the stronger the use of online auctions.* Finally, security issues affect e-business adoption and use (Pinker et al. 2003). H11: *The lower the decision maker's security concerns with online auctions, the more likely the adoption and the higher the use of online auctions*.

System Context: According to Tornatzky and Klein (1982, p. 33) and Thong (1999), factors influencing the adoption of an information system are its relative advantage, compatibility and complexity: H12: *The higher the perceived relative advantage, the more likely the adoption and the stronger the use of online auctions*. H13: *The higher the compliance with existing distribution channels, the more likely the adoption and the stronger the use of online auctions.* H14: *The stronger the ease of understanding and use, the more likely the adoption and the stronger the use of online auctions*.

Use intensity refers to the degree of current use of an e-business application (Colecchia 1999) measured by the assimilation stages intention to use, adoption (yes/no) and routine (type and intensity of use) (Zhu et al. 2006, p. 1559). Obviously, the variable 'routine' can only be measured by adopters. In order to determine the importance of auction specific functions we refer to Klein (1997, p. 3). Accordingly, auctions offer (1) a *coordination function* by establishing market clearing prices so that a maximum number of products can be sold, (2) a *price setting function* which allows pricing without prior price estimates, (3) an *allocation function* for products that are difficult to sell, and (4) a *distribution function* to reach new customers.

Thus, hotels can use online auctions at eBay as an additional online distribution channel either as an eBay auction or as a Buy-It-Now (BIN) listing. In any case, the aim is to sell (1) last-minute offers, (2) hotel room vouchers of free capacities, or (3) hotel room vouchers on a regularly base. Following Amit and Zott (2001), Dedrick et al. (2003), Zhu and Kraemer (2005), and Fuchs et al. (2010a, b) value creation is measured by the perceived impact on sales (increased bookings and sales), internal processes (e.g. higher occupancy, coverage of fix costs), and other benefits (e.g. satisfied customers, data to retrieve insights about customers' bidding behaviour): H15: *The higher the use intensity of online auctions, the stronger the perceived impact on sales.* H16: *The higher the use intensity of online auctions, the stronger the perceived impact on internal processes*. H17: *The higher the use intensity of online auctions, the stronger the perceived impact on other benefits*. Impact items are considered by adopters in terms of perception, while non-adopters state their beliefs and expectations.

5 Empirical Results

Items were measured on a 7-point scale ('I fully agree' to 'I fully disagree'). The 'I don't know' option was also offered. Similar to other adoption studies (Wu et al. 2003; Fuchs et al. 2010a, b), experience-based survey data was generated, as '(…) *individuals' perceptions of the attributes of an innovation, not the attributes as classified objectively by experts or change agents, affect the rate of adoption* (…)' (Rogers 2003, p. 223). After having developed the survey instrument, an online survey has been conducted in June 2009 targeting the owners/managers of 5,000 hotels in Austria; 206 fully completed questionnaires from all over Austria returned.

5.1 Descriptive Results

Typically for Austria's hotel industry, 93 % of the businesses are family-owned, 92 % located in urban areas and 67 % show fewer than 40 beds. About 32 % are hotels, 30 % apartments, 21 % bed & breakfast, 9 % farm and guest houses, resp. Only 51 (24 %) use online auctions (adopters), while 155 (76 %) do not (non-adopters). About 75 % of non-adopting firms have less than 40 beds, while 70 % of the adopters have more than 40 beds. Moreover, 38 % don't have any budget for online distribution while 25 % devote more than 1,000 Euro per annum. Nevertheless, 1/3 stated to receive more than 30 % of bookings online. About 3 % of executives are aged 31–40 years, 29 % between 41–50 years and 28 % above 50 years. Only 12 % were below 30 years. A *T* test revealed that adoption of online auctions is higher for younger entrepreneurs (sig. 99 %). About 20 % are academics, 26 % have a high school degree and 48 % completed vocational

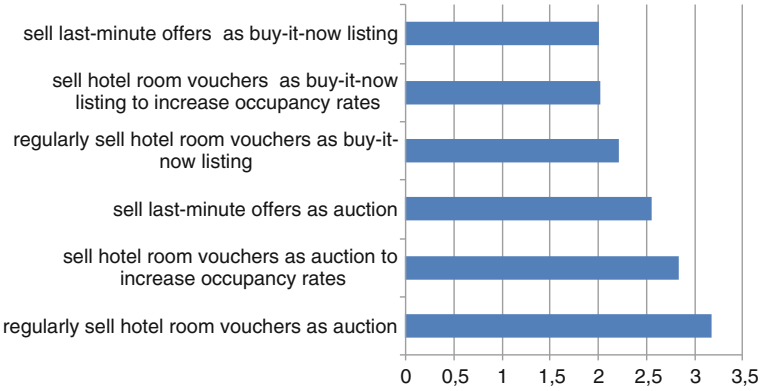

Fig. 3 Perceived usage intensity of online auction types

trainings. A Mann–Whitney-U-Test revealed that entrepreneurs using online auctions show higher education levels (sig. 99 %). Finally, the majority (45 %) had 6–20 years of professional experience (Ø = 15 years), 22 % had more than 20 years and 33 % less than 5 years experience.

With respect to '*readiness*' the majority of executives share the opinion that they (84 %) and employees (82 %) possess sufficient ICT expertise. Interestingly, 2/3 stated to have private or professional experience on eBay. Moreover, 37 % know competitors using online auctions in their business. However, 1/3 rated set-up fees and running expenses for online auctions as high; for 20 % costs associated with online auctions are unknown and 54 % think that listing online auctions requires a lot of time. About 63 % think that eBay is easy to use. Only 61 % rate online auctions as an advantageous additional distribution channel and 40 % had concerns about non paying buyers or bid retractions, both leading to shortfalls in payment. With regard to '*intensity*', 76 % did not use online auctions before. Thus, only adopters (24 %) were surveyed about their usage behaviour of online auctions. The majority use auction-type listings to regularly sell hotel vouchers or to increase occupancy rates in low seasons. By contrast, fixed-price listings (Buy-It-Now) are used only sporadically (Fig. 3). Most hotels (70 %) auctioned-off their rooms through intermediaries, while 30 % do it on their own. Only 41 % of the non-adopters replied that they intend to use online auctions. However, 60 % of the adopters would continue to list their products on eBay. Finally, with respect to '*impact*', 77 % replied that eBay is an ideal distribution channel to attract new customers. Another 74 % stated that online auctions are suitable to increase the firm's reputation. Moreover, 70 % considered online auctions as ideal to increase booking rates in low seasons and, thus, to improve cost coverage (57 %), or to generate additional sales (51 %). However, only a minority recognized the potential asset value from automatically stored auction data for customer behaviour analyses. Similarly, only 32 % experienced higher selling prices through online auctions.

Table 1 Confirmatory factor analysis readiness model

Construct and indicator	Average Adopters	Average Non adopters	Construct reliability Cronbach's alpha	Convergence reliability Std.ized loadings	*t* value (CR)	Discriminant validity SMC	AVE
ICT Expertise			0.512				0.529
Entrepreneur	5.35	5.00		0.797	–[a]	0.634	
Employees	5.78	5.26		0.454	1.876	0.207	
Perceived cost			0.680				0.662
Set up fees	3.08	3.93		0.574	–[a]	0.330	
Time investment	3.55	4.70		0.871	3.698	0.758	
Commitment			0.743				0.726
Rel. advantage	3.67	3.08		0.667	–[a]	0.445	
Compatibility	4.59	4.09		0.876	4.056	0.768	
eBay-Security			0.921				0.930
Non pay. buyers	2.22	3.61		1.057	–[a]	1.118	
Bid retraction	2.18	3.86		0.810	4.844	0.656	
Usability			0.856				0.848
Ease of use	5.45	4.39		0.941	–[a]	0.886	
Ease of process	5.53	4.48		0.788	6.160	0.662	

Cmin/df = 0.422; p = 0.987; AGFI = 0.911; RMSEA = 0.001; CFI = 0.99
CR critical Ratio, *SMC* squared multiple correlations, *AVE* average variance extracted
[a] Value set to 1 for parametric rating

5.2 *Results from Partial-Least Square Modelling*

As a preparatory step, explorative and confirmatory factor analyses were conducted (Hair et al. 2006). For the readiness model 5 factors emerged (Table 1). The intensity model considered the major usage scenarios of eBay, online auction and Buy-It-Now (BIN) listings (Table 2). Impact is reflected by the factors sales and other benefits (Table 3). The constructs were integrated into a global Partial-Least-Square (PLS) model to predict and capture the variance of the dependent variables (Iacobucci 2010). The model could be improved by excluding the variables accommodation type, size and education level. Moreover, the manager's age and professional experience were subsumed into the 'experience' construct. After this adaptation, the PLS model had an excellent *overall fit*, both, with regard to local fit (Table 4) and explanation power (Table 5).

Interestingly, use intensity of online auctions (i.e. auction type listing) is mostly determined by the executives' commitment: their belief whether online auctions are compatible with existing distribution channels and whether they are advantageous (Fig. 4). Moreover, managers' experience and perceived usability significantly affects the intensity to use online auctions. In turn, the use of online auctions shows a strong impact on sales. More precisely, in the eyes of the executives, online auctioning leads to new customers, higher sales, increased booking rates, increased occupancy rates and a better cost coverage. It is interesting to note that,

Table 2 Confirmatory factor analysis intensity model

Construct and indicator	Average Adopters	Construct reliability Cronbach's alpha	Convergence reliability Std.ized loadings	*t* value	Discriminant validity SMC	AVE
Auction type listing		0.666				0.564
Last minute	2.55		0.869	–[a]	0.755	
Inc. occupancy rate	2.84		0.542	3.355	0.293	
Periodic sale	3.18		0.546	3.509	0.298	
Buy It Now listing		0.887				0.835
Last minute	2.00		0.778	–[a]	0.605	
Inc. occupancy rate	2.02		0.838	6.612	0.702	
Periodic sale	2.22		0.949	7.167	0.901	

Cmin/df = 0.323; p = 0.944; AGFI = 0.956; RMSEA = 0.001; CFI = 0.998
CR critical ratio, *SMC* squared multiple correlations, *AVE* average variance extracted
[a] Value set to 1 for parametric rating

Table 3 Confirmatory factor analysis impact model

Construct and indicator	Average Adopters	Average Non adopters	Construct reliability Cronbach's alpha	Convergence reliability Std.ized loadings	*t* Value (CR)	Discriminant validity SMC	AVE
Sales			0.957				0.876
New customers	4.90	5.27		0.913	–[a]	0.833	
Booking rate	4.49	4.66		0.939	10.587	0.881	
Inc. sales	3.90	4.25		0.840	9.047	0.705	
Inc. occupancy rate	4.69	4.94		0.990	14.448	0.979	
Cost coverage	3.90	4.51		0.756	7.220	0.572	
Advertising	4.67	5.02		0.890	12.202	0.792	
Other benefits			0.849				0.715
Final prices	2.57	3.25		0.756	–[a]	0.572	
Transaction costs	3.61	3.86		0.750	4.503	0.562	
Data Mining	3.61	4.59		0.848	6.012	0.719	
Customer satisf.	2.98	3.35		0.709	4.955	0.503	

Cmin/df = 0.504; p = 0.981; AGFI = 0.900; RMSEA = 0.002; CFI = 0.996
CR critical ratio, *SMC* squared multiple correlations, *AVE* average variance extracted
[a] Value set to 1 for parametric rating

in the eyes of the managers, online auctions also affect other benefits within their organization, like reducing transaction costs, inducing higher product prices and customer satisfaction. By contrast, the use intensity of "Buy it Now" (BIN) listings is determined by commitment and security concerns only. The stronger the executives' security concerns are, the more likely they favour BIN listings to avoid risks with online auctions, like bid retractions or final auction prices below going

Table 4 Fit measures measurement model (PLS-based)

Latent construct	AVE > 0,6	Composite reliability > 0,7	$Q^2 > 0$
Experience	0.876	0.934	0.509
Commitment	0.795	0.886	0.337
eBay-security	0.923	0.960	0.594
Usability	0.874	0.933	0.496
Auction type listing	0.604	0.820	0.206
Buy It Now (BIN)	0.818	0.931	0.600
Sales	0.827	0.966	0.738
Other benefits	0.691	0.899	0.391

Remarks AVE average variance extracted

Table 5 Fit measures causal model (PLS-based)

Latent construct	R^2	$Q^2 > 0$
Auction type listing	0.465	0.227
Buy It Now (BIN) listing	0.184	0.121
Sales	0.437	0.313
Other benefits	0.273	0.158

market price levels (Pinker et al. 2003). Finally, in contrast to auction type listings, no (or even slightly negative) effects from BIN listings on firm performance could be identified (Fig. 4). A possible reason is that fixed prices were often set too high, thus, making offers unattractive for customers. An additional reason clearly lies in the low usage rates of BIN listings found in the survey-based sample data (i.e. 26 firms = 12 %).

5.3 Results from Logistic Regression

Finally, the factors influencing the adoption decision in favour to online auctions are identified. The readiness factors from Table 1 (i.e. ICT expertise, perceived cost, commitment, eBay security, and usability) are again used to model the dichotomous adoption decision (i.e. '*to adopt*' vs. '*not to adopt*'). Interestingly, a (stepwise) logistic regression revealed, that only two determinants, eBay security and commitment, emerged as significant drivers behind the adoption decision (Table 6).

Obviously, the major adoption determinant (i.e. acceptance barrier) is eBay security. Commitment had a comparably lower impact on the adoption decision. Overall model fit was highly satisfactory: -2Log-Likelihood = 88.180, Nagelkerke $R^2 = 0.549$ and total prediction accuracy amounts at 82.5 % (Hair et al. 2006, p. 373).

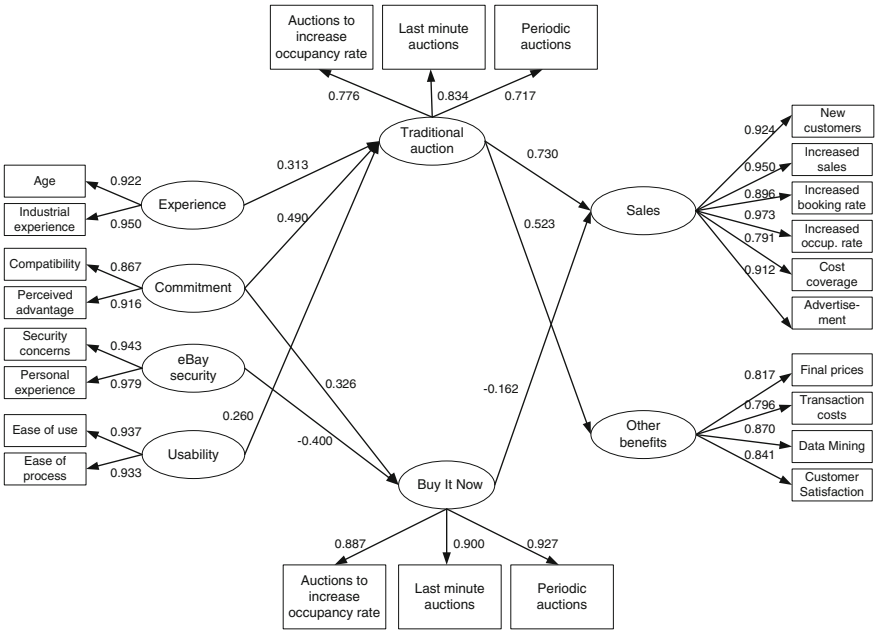

Fig. 4 Global PLS model

Table 6 Logistic regression results

Log-regression coefficient		Sig. level	Exp(B)	Percentage change (%)
eBay security	1.662	0.000	5.271	427.10
Commitment	0.778	0.008	2.178	117.80
Constant	−0.201	0.465	0.818	

6 Summary and Implications

In contrast to similar studies, no effects from ICT expertise on the propensity to adopt or to use online auctions could be identified (H1). Moreover, no empirical relationship between perceived costs and the propensity to adopt and use online auctions could be found (H2). However, as suggested by theory, a positive attitude of executives towards online distribution channels leads to significantly higher adoption and usage rates (H3). Although a Mann–Whitney-U-Test revealed higher adoption rates for larger firms, H4 and H5 were rejected, as neither a significant correlation between hotel-size or ownership and usage intensity of online auctions is observed. Interestingly, logistic regression revealed that competitive pressure and customer demand have a significant impact on the decision to adopt online auctions (H6, H7). H8 stated that younger entrepreneurs use online auctions more intensively and this could also be empirically observed. However, executives'

education level (H9), and industrial experience (H10) are not impacting the use of online auctions. Security issues emerge as key determinant for the decision to adopt and use online auctions. Similarly, positive attitudes towards online auctions and their compliancy with existing distribution channels leads to high adoption rates (H11, H12, H13). Perceived usability (H14) significantly affects usage rates (but not the adoption decision). Following Klein (1997), three auction functions were recognized as especially useful by executives (in descending order): the *distribution* function (i.e. regular sale of accommodation packages), the *coordination* function (i.e. sale of vacant accommodation capacities in low season) and the *allocation* function (i.e. last minute auction). The strongest effect identified from online auctions on firm performance was the perceived impact on sales (H15). While the use intensity of online auctions did not show any impact on internal processes (H16), the impact on "other benefits", like customer satisfaction, cut down transaction cost, was highly significant (H17).

Although, similar to other online distribution channels, online auctions only require minimal technical and organisational prerequisites, their adoption rate in the (Austrian) hospitality industry amounts at 25 % and only 60 % of the adopters plan to further use online auctions in the future. Thus, in order to enhance distribution effectiveness of online auctions in tourism, eBay could support the attraction of higher numbers of bidders (i.e. customer traffic) what, in turn, would increase final prices and provisions. As a further implication, most importantly, however, are efforts to communicate security improvements at eBay, like the 128-bit encrypt technology for registration, log-in and transactions as well as the double confirmation before submitting a bid by the customer. Finally, due to the low entry and exit barriers combined with an exceptionally high success rate and relatively low operation costs (Ho 2008), tourism suppliers are recommended to test and experiment with online auctions, and, according to individual success rates, to consider a permanent use of online auctions.

7 Conclusion, Study Limitations and Outlook

An adapted Readiness-Intensity-Impact model based on Zhu and Kraemer's (2005) *Technology-Organization-Environment* framework was employed to empirically identify the factors determining the adoption of online auctions within the hotel sector. Moreover, hypotheses regarding effects on hotel performance from the use of online auctions were tested by using a causal modelling approach (PLS method) and logistic regression (Hair et al. 2006). In doing so, for the first time, insights about the drivers behind the decision to adopt and use online auctions in the accommodation sector are gained. Moreover, related effects on firm performance as perceived by executives were identified and quantified.

However, the research study at hand shows various limitations: first of all, two limiting issues are related to the low rate of response and likely connected biasing forces. It is reasonable to assume a bias in the study sample which is induced by

the managers' willingness to take part in the online survey. More concretely, the 206 subjects that responded are likely to show significantly different attitudes towards on-line marketing in general than the majority of those who did not respond to the survey invitation. Moreover, the empirically gained results cannot be generalized, as they are restricted, both from a time perspective (i.e. survey year 2009) and from a geographical perspective (i.e. the hotel sector in Austria). To conclude, a promising and highly under-studied field of future research is the systematic investigation of usage barriers for bidders (i.e. customers) at the various stages of involvement using online auctions in the travel and tourism domain.

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Toward a Characterisation of the Maturity of Organisational Online Capabilities: The Case of Hotel Distribution in Morocco

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Abstract Applying the resource-based view (RBV), this article examines two organisational capabilities in the hotel distribution sector: strategic alignment and dynamic capabilities. Exploratory interviews conducted with business managers (BMs) and technology managers (TMs) from the hotel sector allowed to operationalise three constructs used in this research: the maturity of strategic online alignment, the maturity of dynamic online capabilities, and organisational performance. A subsequent questionnaire survey administered among BMs and TMs from 101 hotels in Morocco then allowed to validate the three hypotheses of this research: H1 Strategic alignment maturity has a direct and positive effect on the maturity of dynamic online capabilities; H2 The maturity of dynamic online capabilities is significantly linked to organisational performance; H3 The maturity of strategic online alignment is significantly linked to organisational performance.

Keywords Strategic alignment maturity · Maturity of dynamic capabilities · Organisational performance · Internet · Hotel · Morocco

1 Introduction

In a context marked by growth in innovation and by transformation in the motivations of tourists, the Internet as a technology and information resource in the sense of the resource-based view (RBV) is a driver of economic and management change. The Internet is revolutionizing distribution models in the hotel sector by

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supporting disintermediation strategies and by allowing for innovative solutions that create and disseminate differentiated and personalised content.

The Internet is recognised as having an impact on the performance "of" and "in" a firm. In information systems management, performance in a firm can be studied from a so-called proximal perspective that is interested in the direct impact of information technologies (IT). Studies on user satisfaction, the quality of information and the quality of systems are generally based on this perspective (Chan et al. 1997; Delone and McLean 1992). Firm performance can also be studied from a distal perspective, which examines a firm's overall performance across economic, social and management aspects.

The question of how IT investments might translate into performance is one of the most often discussed questions in the literature (Desq et al. 2002). However, despite the considerable volume of research activity, the results of these studies often remain mitigated and contradictory (Bharadwaj 2000), explaining the difficulty of establishing a direct and positive link between the investments and performance.

Today, it is widely recognised that the true challenge facing businesses with regard to the Internet is not so much its technological dimension but rather its information- and management-related aspects. Venkatraman (2000) considers that the main challenge consists of aligning the management of the Internet with the firm strategy. In that context, the strategic alignment of IT—a concept at the intersection of two research domains in management sciences, namely information systems and strategic management—becomes a key question (Bergeron et al. 2004; Reich and Benbasat 1996).

Strategic IT alignment is a condition *sine qua non* for achieving the desired performance (Sabherwal and Chan 2001). However, too often the operationalisation of this alignment remains limited (Bergeron et al. 2004) and only few empirical studies examine the appropriate way of aligning the firm strategy with the deployment of IT (Chan et al. 2006; Luftman 2000). In that context, the concept of strategic IT alignment has drawn considerable criticism, among others from Ciborra (1997), who maintains that the construct does not always apply to reality.

The challenge of operationalising the strategic alignment concept is complex because it must identify the nature and number of dimensions to align. This includes the overall firm strategy and the information systems strategy as well as the alignment maturity threshold required for achieving the performance. The maturity concept, often associated with a firm's various information growth models (Benbasat et al. 1980), presents a suitable perspective for evaluating the required degree of alignment and performance. However, in order to reach a satisfactory level of alignment maturity, the BMs (often the CEOs) and TMs (often the CIOs) must have considerable management skills and strong relationships with each other (Huang and Hu 2007).

This study has the following two objectives:

- Present the constructs of the maturity of organisational online capabilities in direct distribution of the hotel sector;
- Evaluate the impact of the maturity of organisational online capabilities on organisational performance.

2 Literature Review

2.1 Definition and Theoretical Foundation of Strategic Alignment

How might we define the concept of strategic alignment? Henderson and Venkatraman (1993) define alignment as being the entirety of relationships, going both ways, between the four alignment dimensions, being firm strategy, IS strategy, organisational structure and IS structure. Luftman (2000) defines strategic alignment as the ideal harmony between the deployment of IT and the objectives and needs of the firm, stating that "Business-IT alignment refers to applying Information Technology (IT) in an appropriate and timely way, in harmony with business strategies, goals and needs" (p. 3). Reich and Benbasat (1996) place emphasis on the degree to which the missions, objectives and planning of IT support and are backed by those of the firm.

At the theoretical level, strategic alignment is rooted in contingence theory (Raymond and Bergeron 2010; Bergeron et al. 2004; Donaldson 2001; Drazin and Van de Ven 1985), according to which organisational viability is dependent on the capability of the organisation to align its internal components with its environment: "The key concept in a contingent proposition is fit, and the definition of fit that is adopted is central to the development of the theory" (Drazin and Van de Ven 1985, p. 515). The RBV, which is increasingly used as a theoretical basis for understanding strategic alignment, emphasises that a firm can gain a competitive advantage and realise its performance objectives over the long term (Barney 1991; Grant 1991; Wernerfelt 1984) under the condition that its resources are heterogeneous, immobile and unique to the firm (Mata et al. 1995). According to Reich and Benbasat (1996), any alignment process is unique to a given firm, as it must invariably take account of the firm's specific objectives and its capability for knowledge exchange between the different actors. In a similar vein, Luftman and Kempaiah (2007) view strategic alignment as involving "interrelated capabilities that can be gauged by measuring six components: communications, value, governance, partnership, scope and architecture, and skills" (Luftman and Kempaiah 2007, p. 165).

According to Luftman et al. (1999), the social dimension is fundamental to achieving alignment. This dimension highlights the capability of BMs and TMs to engage in common missions and objectives, to share experiences and to speak the

same language (Reich and Benbasat 1996). The sharing of knowledge and competencies between BMs and TMs promotes interactions between the two parties and maximises their chances of attaining a high level of strategic alignment (Kearns and Sabherwal 2007; Chan et al. 2006).

Luftman and Kempaiah (2007) stress the importance of strong support from upper management, solid working relationships, strong leadership, appropriate prioritisation, trust and efficient communication between BMs and TMs, as well as an in-depth understanding of the business and technology environments.

2.2 Maturity of Dynamic Online Capabilities

The concept of "dynamic capabilities" was coined by Teece et al. in their 1997 article "Dynamic Capabilities and Strategic Management" and has since received considerable research attention for its promising potential (Helfat et al. 2007; Eisenhardt and Martin 2000; Teece et al. 1997). The literature review revealed a wide range of definitions given to "dynamic capabilities." The original definition by Teece et al. (1997) emphasises a firm's aptitude to integrate, create and reconfigure existing competences internally or externally in order to meet the challenges of a rapidly changing environment. Eisenhardt and Martin (2000), for their part, refer to processes in which a firm "use[s] resources—specifically the processes to integrate, reconfigure, gain and release resources—to match and even create market change" (p. 1107).

The article by Helfat and Peteraf (2003) entitled "The Dynamic Resource-Based View: Capability Lifecycles" is one of the rare, if not the only, studies that examine dynamic capabilities from the angle of maturity. It presents dynamic capabilities as embedded in a lifecycle encompassing three stages: the founding stage, the development stage and the maturity stage. In addition, the authors identify six possible trajectories which dynamic capabilities may take following the development stage. Referred to as the 6 Rs, they are retirement, retrenchment, replication, renewal, redeployment and recombination.

The dynamic capabilities lifecycle proposed by Helfat and Peteraf (2003) integrates management and organisational approaches. It adopts an evolutionist perspective in that it explains the possible trajectories which dynamic capabilities take from their initial development through to maturity. In so doing, it tacitly acknowledges their organisational dimension.

2.3 Organisational Performance in the IT Context

Performance is a fundamental and recurrent theme in the discourse of managers as well as in management science research. Polysemic and controversial, the concept of performance is the subject of a vast body of literature. Lorino (1997) considers

that performance refers to anything that could improve the trade-off between value and cost. Carter et al. (1994) equate performance with a firm's capability to sustain, over the long term, satisfactory growth and profitability margins.

In information systems management, the question of the analysis of the relation between IT and organisational performance is addressed from many angles. An evaluation approach founded on social psychology emphasises the human dimensions of organisation, such as the appropriation and acceptability of IT. The evaluation approach, for its part, is founded on competitive analysis and gives importance to the interplay of competitive forces. It pays particular attention to the balance of the market, the evolution of the sector and to market shares.

The economic theory of production uses productivity to explain the variance of organisational performance. Investment in IT is always considered as an "input" coming from a firm's production function. This approach allows to exploit the potential economic gains of IT by taking into consideration business and marketing indicators such as increase in sales, profitability, needs assessment and customer satisfaction.

3 Research Hypotheses

The strategy of bypassing intermediaries in the distribution chain could have considerable advantages for hotels provided it relies on capabilities that can be dynamically renewed in keeping with technological and management changes.

Many authors recommend strategic IS alignment as a pertinent predictive variable of performance (Sabherwal and Chan 2001; Chan et al. 1997; Henderson and Venkatraman 1993). Our research aims to build on and develop this research by testing the following hypotheses:

H1 Strategic alignment maturity has a direct and positive effect on the maturity of dynamic online capabilities

H2 The maturity of strategic online alignment is linked significantly to organisational performance

H3 The maturity of dynamic online capabilities is linked significantly to organisational performance.

4 The Empirical Framework of the Research

This section will examine the methodological approach and the operationalisation of the constructs.

Table 1 Breakdown of the survey respondents

	Function title	n	%
Business managers (BMs)	Hotel director	16	15.84
	Communication director	15	14.85
	Marketing director	22	21.78
	Revenue manager	14	13.86
	Commercial agent	18	17.82
	Assistant marketing director	15	14.85
Sub-total		101	100
Technology managers (TMs)	E-Commerce manager	20	19.8
	Information system manager	7	6.9
	Webmaster	74	73.2
Sub-total		101	100
Total		202	

Note The Moroccan Ministry of Tourism provided a list of all 4 or 5 star hotels in the country, which totalled 237. The sample of 101 hotels in this survey was derived from that list

4.1 Research Methodology

The exploratory study comprised 11 semi-directed interviews realised with hotel managers (7 BMs and 4 TMs) of hotels in Morocco. The interviews had the objective of identifying the dynamic capabilities unleashed by the disintermediation policy in hotel distribution, of determining the organisational performance variables, and of establishing which type of language to use in a survey questionnaire to be administered to hotel operators.

Subsequent to these interviews, said survey questionnaire was administered to 202 hotel managers (101 BMs and 101 TMs) in order to collect data required for testing the research hypotheses. A breakdown of the respondents is presented in Table 1. Only managers from 4 or 5 star hotels were retained as these hotels showed for a fairly high level of Internet usage.[1] Managers from hotels with 1, 2 or 3 stars were not retained in our sample as these establishments rarely distinguish between strategic and technological functions.

[1] According to Horwath HTL (2009), 70 % of 4 star hotels and 100 % of 5 star and luxury hotels have a website, compared to only 49 % of the 3 star hotels, 2 % of 2 star hotels and 1 % of 1 star hotels.

4.2 Operationalisation of the Constructs of the Model Proposed in this Research

An overview of descriptions of the constructs from both literature and practice in the field was necessary to operationalise the constructs of the maturity of strategic online alignment and of the maturity of dynamic online capabilities. The indicators for measuring these two constructs of the proposed model were drawn from the literature on the strategic alignment maturity model (Luftman 2000) and the dynamic capability maturity model (Helfat and Peteraf 2003). Thereafter, the indicators were adapted to the characteristics of the hotel sector. The indicators for measuring the construct for online organisational performance were identified starting from the exploratory interviews held with hotel BMs and TMs and e-business experts from the hotel sector.

Construct of strategic online alignment maturity. This operationalisation was performed by asking BMs and TMs their opinions of the following variables of the alignment maturity model of Luftman: understanding, shared measures, trust and level of encouragement of innovation.

One questionnaire was designed for the BMs and another for the TMs. Table 1 presents the indicators retained for determining the perceptions of BMs and TMs with regard to strategic online alignment maturity.

To evaluate the strength of the indicators of this construct, the perception of the respondents was evaluated according to a 5-point Likert scale: 1 = Very weak, 2 = Weak, 3 = Medium, 4 = Fairly strong, 5 = Very strong.

Construct of dynamic online capability maturity. The exploratory stage with the BMs and TMs allowed to identify the following dynamic capabilities in the online distribution of the product:

- Creation of content
- Spread of content
- Search engine optimisation
- Dynamic pricing.

Then, each of the four dynamic capabilities in the hotel distribution identified by the BMs and TMs was matched with one of the four criteria (replication, redeployment, renewal and recombination) for dynamic capability maturity proposed by Helfat and Peteraf (2003). This matching allowed to identify 16 indicators for measuring dynamic Internet capability maturity (Fig. 1).

Many studies, in particular that of Moore and Benbasat (1991), recommend reducing the number of indicators in order to have a more manageable number. To determine the most pertinent indicators in the case of direct hotel distribution by Internet, we contacted four TMs other than those who participated in the exploratory study, and asked them to estimate the level of application of the 16 indicators to their hotel's e-business capabilities according to the following scale: Applies completely; Applies somewhat; Does not apply at all; Applies but refers to another

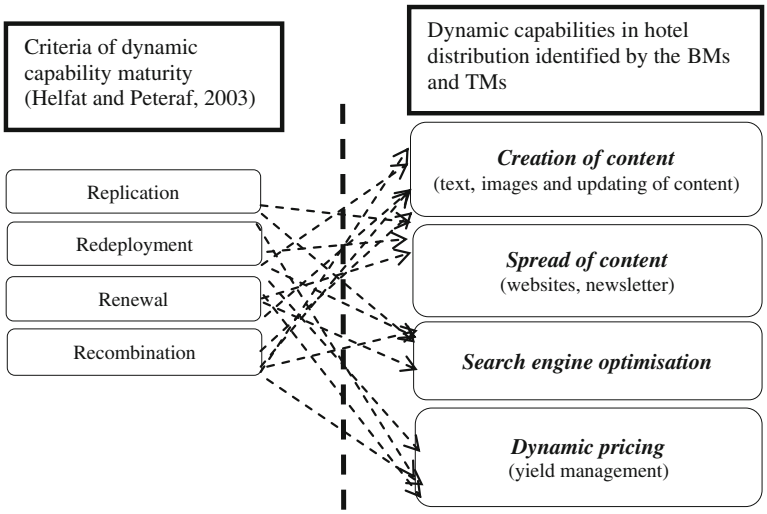

Fig. 1 Indicators for measuring dynamic online capability maturity

Table 2 Indicators retained for finding out the perceptions of BMs and TMs of strategic online alignment maturity

Strategic alignment maturity	Perceptions of BMs	How do you perceive the work of web developers?
		How do you perceive the tools for measuring the performance of activities realised with the team of web developers?
		How do you perceive the level of trust in your relationships with the team of web developers?
		How do you perceive the encouragement you receive from the team of web developers for innovation in your activities?
	Perceptions of TMs	How do you perceive your firm's e-business strategy?
		How do you perceive the tools for measuring the performance of activities realised with the e-business strategy team?
		How do you perceive the level of trust in your relations with the business and marketing strategy team?
		How do you perceive the encouragement you receive from the business and marketing strategy team for innovation in your activities?

field of capability, such as strategy, financial evaluation or business organisation. Thanks to this operation, the initial number of 16 indicators was reduced to nine.

The verification of the factorial structure of the construct by means of the component principal analysis (CPA) allowed to eliminate those indicators that were the least represented while retaining a maximum of information. The CPA allowed to reduce the number of indicators for the evaluation of dynamic Internet capability maturity to 6 (Table 2). Three are related to the creation of content, one

Table 3 Indicators retained for the evaluation of the dynamic online capability maturity

Your content is disseminated and SEO optimised on an on-going basis
You create content for each new market or segment
You create content for new offers
You apply dynamic pricing to new offers
You disseminate content for each new market or segment
You SEO optimise your website for each new market or segment

to the spread of content, one to search engine optimisation and one to dynamic pricing.

Construct of organisational performance. The generation of indicators measuring organisational performance in the context of the electronic distribution of hotels was based on characteristics of the Moroccan tourism context, which showed a predominance of international tour operators and the incapability of local operators to manage tourism and financial fluxes. In fact, Morocco is behind in tourism distribution compared with European countries.

The Internet is recognised for giving local tourism operators a means to establish more autonomy and profitability, to liberate themselves from intermediaries.

The indicators retained, presented in Table 3, are derived from the semi-directed interviews held with the BMs and TMs. They reflect the interest of hotel managers in engaging in direct online distribution and to thereby reap commercial and marketing benefits.

5 Results

After examining the methodological approach and the operationalisation of the constructs (Sect. 4), the next step in this research was to test the hypotheses. Thanks to the bootstrapping calculation and the PLS algorithm of the software SmartPLS, it was possible to do it. For this, we had to monitor two values simultaneously: the t-values and the path coefficients. The t-values are statistically significant at the threshold of 1, 5 and 10 % if and only if they are superior to the absolute values of 2.57, 1.96 and 1.64 respectively. Below these thresholds, the significance of the hypotheses seems to be reduced. The path coefficients had to show positive values, ideally in proximity to the value of 1.

The results obtained by the PLS method allowed to validate the three hypotheses (Table 4). They show the very close link between strategic online alignment maturity and dynamic online capability maturity (H1) and between dynamic online capability maturity and organisational performance, in both cases with a significance threshold of 1 %. Moreover, they show that strategic online alignment maturity is only related to organisational performance at a significance threshold of 5 % (Table 5).

Table 4 Indicators retained for measuring organisational performance

Variables	Indicators
Business performance	Increase of the profit margin
	Retrenchment of margins transferred to intermediaries
	Growth of direct e-sales
	Growth of non-accommodation sales
Marketing performance	Acquisition of new international markets
	Acquisition of new client segments (e.g., business tourism, wellness tourism)
	Understanding of the expectations and needs of clients
	Identification of the principal purchasing criteria (price, quality, etc.)
	Customer satisfaction by use of the proposed e-services (website, newsletter, etc.)
	Personalisation of services

Table 5 Results of the survey questionnaire administered to BMs and TMs of Moroccan hotels in order to establish a theoretical model of organisational online capability maturity

	Hypotheses	t-values	Path coefficients	Validity of hypotheses
H1 SOAM → DOCM	Strategic online alignment maturity has a direct and positive effect on dynamic online capability maturity	4.445870	0.604049	Supported
H2 SOAM → OP	Strategic online alignment maturity is significantly linked to organisational performance	1.958209	0.286951	Supported
H3 SOAM → OP	Dynamic online capability maturity is significantly linked to organisational performance	3.882477	0.566389	Supported

Legend:
H1 hypothesis 1, *H2* hypothesis 2, *H3* hypothesis 3
SOAM strategic online alignment maturity
DOCM dynamic online capability maturity
OP operational performance

Figure 2 presents the research model enhanced with the indicators retained for the operationalisation of the research concepts as well as the significance threshold of the tested links.

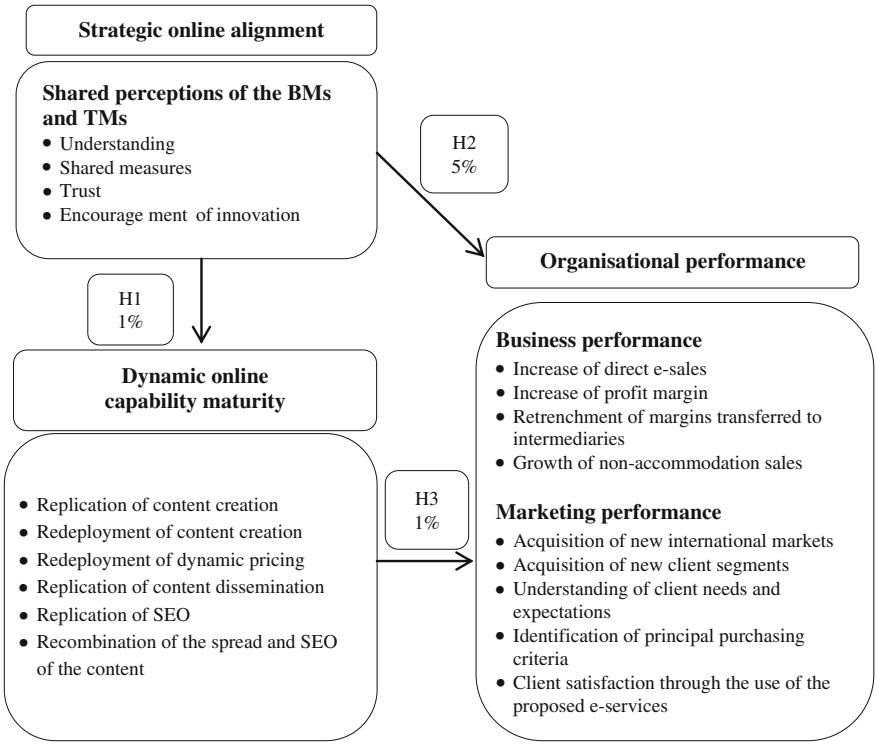

Fig. 2 Characterisation of the maturity of organisational online capabilities

6 Conclusion

Starting from an empirical field still little studied in management—that of the maturity of online capabilities—this article put the accent on two constructs of organisational online capability maturity. This research tried to contribute to the theoretical and empirical knowledge of capability maturity and of the impact of capabilities on organisational performance.

In terms of the contribution of this work, this article presents one of the first empirical validations, to our knowledge, of the concept of dynamic capability maturity. This is complemented by the identification of dynamic capabilities in the hotel distribution sector as well as their maturity criteria. The demonstration of the existence of a very strong linkage between dynamic capability maturity and organisational performance corroborates the wide-spread acceptance in the literature of the dynamic capabilities concept (Teece et al. 1997; Eisenhardt and Martin 2000).

At the methodological level, the article concentrated on the operationalisation of concepts by application of a combined quantitative and qualitative analysis approach that focused on deploying an Internet strategy in hotel distribution and on the performance of hotel structures. As for the management implications, this

study sought to advance research by improving the use and evaluation of the Internet in distribution. The results obtained may thereby manifest in the form of management recommendations.

The proposed model also contributes to the understanding of the relational dynamic of strategic alignment by highlighting the linkages between the perceptions and behaviours of the diverse actors. This includes an examination of the interactional dynamic between BMs and TMs and a focus on specific themes such as communication, sharing of responsibility and the degree of interaction between BMs and TMs (Chan and Reich 2007; Reich and Benbasat 1996; Luftman et al. 1999).

This study revealed that online capabilities in the hospitality industry can only contribute significantly to competitiveness if they are coordinated with the two business capabilities that concern direct distribution—strategic alignment and dynamic capabilities. Strategic alignment plays a crucial role in ensuring the satisfaction of managers, and therefore in promoting their dynamic capabilities. As mentioned in the results of this study, the maturity of dynamic capabilities is significantly related to the performance of the organisation. Essentially, it comprises the improvement of operational efficiency as manifested in the improvement of communication activities, the reduction or elimination of the costs of commissions, the understanding and acquisition of new customers, the customisation of services, the differentiation from competitors and the strengthening of loyalty programmes.

In all, the proposed theoretical approach can be used by executives from hotel distribution as an analysis framework for assessing the maturity of their dynamic capabilities and their strategic online alignment.

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Assessing the Visibility of Hotels on Smartphones: A Case Study of Hotels in Hong Kong

Daniel Leung, Hee "Andy" Lee, Lawrence Hoc Nang Fong and Rob Law

Abstract Although smartphones are gradually becoming the primary Internet access device for travellers to research and purchase hotel accommodations, the readiness of the hotel industry to the mobile consumerism era has not been fully examined. Using hotels in Hong Kong as a case study, this exploratory study assesses the visibility of hotels on smartphones by: (1) examining the visibility of all Hong Kong hotel websites on smartphones using different operating systems; and (2) examining the availability of smartphone apps developed by all Hong Kong hotels in different smartphone application stores. The empirical findings suggest that more than half of Hong Kong hotels have optimised their websites for iOS- and Android-operated smartphones. Nevertheless, only a handful of hotels developed smartphone apps for connecting with customers. The Chi Square test results demonstrate that star rating and brand affiliation are associated with the visibility of hotels on smartphones. Managerial implications are discussed.

Keywords Smartphone · Visibility · Mobile websites · Smartphone apps · Hotels

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1 Introduction

With power-efficient processors, user-friendly interfaces, high-speed Internet access, high-resolution touchscreen displays as well as productivity-enhancing applications, smartphones have been evolving into powerful gadgets supporting a wide range of information services for customers (Wang et al. 2012; Want 2009). As the functionality and services available on smartphones have been substantially expanded, smartphones are gradually becoming the primary Internet access device in both developed and developing countries (eMarketer 2012a, b). Some studies have even posited that smartphones are irreversibly changing consumers' daily lives and their way of accessing the Internet.

Despite their short history in tourism and hospitality, smartphones have been increasingly used to research and purchase hotel accommodation and other tourism-related products because they match travellers' needs for mobility and ubiquitous information support. Based on an analysis of more than 300 million visits to 31 hotel websites worldwide in late 2012, Adobe Systems Incorporated found that nearly one-sixth of traffic to those websites came from smartphones and tablets (eMarketer 2012c). Another market report conducted by eMarketer (2012d) also estimated the figure of consumers booking travel on smartphones and tablets would increase to 36.7 million in 2016, up from approximately 16 million in 2012.

Since the emergence and prevalence of smartphones reflect a shift toward a mobile-centric behavioural pattern, a substantial body of studies have been conducted to understand the extent of travel-related capabilities offered by smartphones (Lashkari et al. 2010), their impact on travellers' touristic experience (Wang et al. 2012), and the level of adoption by tourism suppliers (Liu and Law 2013). Though the issues pertinent to the application of smartphones in tourism and hospitality have been widely examined, no empirical studies have yet been found in the hotel context compared to a plethora of prior studies on the travel domain (Dickinson et al. 2012; Liu and Law 2013; Wang and Xiang 2012). While more hotel queries occur through smartphones and tech-savvy customers expect hotels to keep up with the technological advancement, the understanding pertinent to visibility of hotels on smartphones remains unknown.

Another limitation among prior studies is found in their focus on smartphone applications (apps) only (Dickinson et al. 2012; Liu and Law 2013; Wang et al. 2012; Wang and Xiang 2012). Scholarly attention towards the visibility of websites on smartphones or mobile website is, however, scant. According to the Adobe 2012 Mobile Consumer Survey (Adobe Systems Incorporated 2012), online consumers use their smartphones to connect with brands and make a purchase via both company websites and/or smartphone apps. Lobo (2011) claimed that users might find it difficult to access desktop websites in smartphones, and thereby result in dissatisfaction. As the visibility of a website on smartphones is a crucial determinant affecting consumers' online experience as well as their subsequent behaviour, it would be useful to examine if hoteliers optimise their mobile website in order to avoid irritating consumers with incompatible functions.

In the era of mobile consumerism, travellers have been, and will continue to be, more dependent on smartphones for researching and purchasing hotel accommodations. Nevertheless, the readiness of the hotel industry to the mobile consumerism era has not been fully examined. Using hotels in Hong Kong as a case study, this exploratory study aims to provide an answer to the research question of "How visible are hotels in the smartphone era?" through: (1) examining the visibility of all Hong Kong hotel websites on smartphones using different operating systems; and (2) examining the availability of smartphone apps developed by all Hong Kong hotels in different smartphone application stores. To date, knowledge on the application of smartphones in the hotel industry is rather limited. As the functionality of smartphones and their associated applications appear to become a new wave of innovation supporting the continuous development of tourism and hospitality, this study would contribute to the literature by exhibiting the readiness of hotels in encountering this innovation wave.

2 Literature Review

In view of their ubiquity and advanced computational capabilities for information exchange and repositories, smartphones are now an inseparable partner from travellers (Dickinson et al. 2012). Indeed, the tourism and hospitality industry is particularly suitable for the adoption of smartphones because tourism is an information intensive industry in which people search for a large amount of information, particularly in unfamiliar environments (Kurata 2012). Since travellers generally collect and review various forms of information before and during the trip in order to minimise the risk of making wrong decisions, smartphones with increased capacity in communication and connectivity provide a wide range of support for routine (e.g., planning and reservation) and detailed travel activities (e.g., locating tourist spots and estimating waiting time of rides).

Though the application of smartphones in tourism and hospitality is still in its infancy stage, the emerging literature on travel and tourism coins the huge potential of smartphones for travellers' touristic experience transformation. Drawing on the 202 customer reviews on the 100 most popular travel-related smartphone apps, Wang et al. (2012) found that travellers with the help of smartphones could get a good value out of their trips and became more efficient in travel planning. In another study on the travel-related smartphone apps, Wang and Xiang (2012) concluded that smartphones have comprehensively extended the Internet-enabled service including information search, reservation and eCommerce, multimedia content consumption and creation, as well as social communications to the mobile platforms. In a recent survey with American smartphone and tablet owners, eMarketer (2013) reported that approximately 98 % of these owners took their devices with them on vacation. Moreover, nearly 80 % of the respondents used them all the time. This demonstrated the use of smartphones and tablets during travel cannot only

enable them to construct a better sense of travel destination, but also reconnect them with their daily lives.

Besides discussing the impact of smartphones on travellers' touristic experience, a number of academic and industry research studies noted the potential of smartphones in business applications and advocated the importance of incorporating smartphones into the tourism and hospitality industry (Rasinger et al. 2007). Dickinson et al. (2012) reviewed 164 top visitor attraction apps and demonstrated a range of technical functionalities varying from basic systems delivering web contents to mobile devices to more sophisticated context awareness tools. In an examination on the adoption of smartphone apps by airlines, Liu and Law (2013) posited that smartphone apps could be used as a strategic tool to help generate revenues, increase the efficiency of communication with customers, and enhance customer loyalty. Morell (2013) also empirically demonstrated how smartphone apps could improve the quality of customer service in theme or amusement parks through showing the exact location of rides, checking on wait times at different attractions, reserving a place in line at a ride and other ways.

In the hotel context, the application of smartphones has received much attention in the practitioner literatures (Schaal 2012; Stehle 2013). Nevertheless, there is a woeful lack of research on this issue in academic journals. Despite the existence of smartphone-related studies on the tourism domain, academic researchers largely concentrated on smartphone apps. Mobile websites, another platform for content, applications, and service on mobile devices (Lobo et al. 2011; W3C 2013), have remained under-investigated in scholarly research. As noted by Wisniewski (2011), smartphone apps are recognised as more responsive and convenient than websites from user experience perspective. However, the platform-specific nature and time-consuming cyclical update of smartphone apps make some users prefer visiting company websites via the pre-installed browsers in the smartphones (e.g., Safari on iPhone) (Wisniewski 2011).

Technically, mobile website browsing with a smartphone is similar to desktop website browsing with a desktop or a laptop computer. Yet, some researchers posed the concern regarding accessing desktop websites with smartphones. As noted by Lobo et al. (2011), desktop websites are originally designed for a large monitor. Due to the relatively small screen size, smartphones are limited in some features and unable to display some information, which is available on desktop computers. Han and Mills (2006) stressed that travellers are less likely to form a good impression about a destination which, in turn, negatively influences their decision making process if its website is not user-friendly. As the visibility of websites on smartphones plays a critical role determining the ultimate success of online business of a company, it is of importance to examine the visibility of hotel websites on different smartphones in order to sustain the company's competitiveness in the smartphone era.

Chung and Law (2003) empirically evaluated the information quality of 80 hotel websites in Hong Kong across different hotel classes. The result indicated that the websites of luxurious hotels were more comprehensive than those of mid-priced and budgeted hotels. Abrate (2011) noted the rating system indicates a

tangible commitment made by firms to particular levels of service provision and quality. Since higher star ratings relate positively to enhanced physical attributes and higher quality in all aspects (Abrate et al. 2011), hotels with higher star ratings may offer more comprehensive service and better online experience for consumers in order to maintain their service standard and reputation.

In addition to star rating, hotel's brand affiliation is another decisive factor which is frequently discussed by previous researchers in the dissimilar adoption of information technology and website effectiveness. Siguaw et al. (2000) examined the utilization of information technology in hotels from the United States, and found that chain hotels made larger investment in information technology. Klein and Saft (1985) noted that a brand name implies the creation of a standardized product or production process. Barrows and Powers (2008) suggested that chain hotels are able to acquire financial and technical support from their corporate headquarters. They have a better quality assurance policy and implementation scheme. As the management of chain hotels are more familiar with Internet technology and the way to satisfy customers' information needs, they are able to outperform their independent counterparts in terms of website functionality performance. Since star ratings and brand affiliation are found to be important factors affecting hotel's inclination to technology adoption, this study would also examine if the visibility of hotels on smartphones is associated with their star ratings and brand affiliation.

3 Research Method

3.1 Data Collection

To recap, the research objective of this exploratory study is to examine the visibility of hotels on smartphones through: (1) examining the visibility of all Hong Kong hotel websites on smartphones using different operating systems; and (2) examining the availability of smartphone apps developed by all Hong Kong hotels in different smartphone application stores. Data collection was conducted in July 2013, and all 122 hotels in Hong Kong, which are members of the Hong Kong Hotels Association, were analysed in this study. To achieve the study objectives, three major mobile operating systems were selected for analysis. According to the latest *IDC Worldwide Mobile Phone Tracker Report* (International Data Corporation 2013), the top three smartphone operating systems are Android (79.3 %), iOS (13.2 %) and Windows Phone (3.7 %) in terms of their market share in 2013. Despite the relatively low share of Windows Phone, this system posted the largest year-over-year growth among the top five smartphone platforms from 2012 to 2013. The Program Manager with IDC's Mobility Tracker Programs also posited that the increase in adopting Windows Phone will continue in the coming quarters. Since these three systems account for more than 95 % of the market share, the

Fig. 1 Mobile website

inclusion of smartphones with these three systems could enhance the representativeness of the findings. Hence, three smartphones, which are Samsung Galaxy SIII (using Android), Apple iPhone 4S (using iOS) and Nokia Lumia 610 (using Windows Phone), were used for data collection.

To achieve the first objective, the Uniform Resource Locators (URLs) of all 122 hotel desktop websites were firstly typed in the address bars of the pre-installed browsers in the three chosen smartphones. The visibility of the hotel websites were then coded based on pre-determined trichotomous scales (i.e., 1 represents "convert to mobile website", 2 represents "convert to desktop website", and 3 represents "invisible"). Figures 1 and 2 exhibit the examples of "mobile website" and "desktop website". All coding results were cross-verified by two researchers to ensure their validity. Consequently, the coding results by multiple researchers were consistent and no variation was found.

Regarding the second objective, the smartphone apps developed by all Hong Kong hotels were searched via the designated application stores for the three operating systems (i.e., Google Play for Android; Apple App Store for iOS; Windows Marketplace for Windows Phone). The names of the 122 hotels were typed in the search bars of those smartphone application stores. The availability of the smartphone apps was recorded based on the written instruction (1 represents

Fig. 2 Desktop website

"smartphone app is available" and 2 represents "smartphone app is unavailable"). To ensure the data validity, another round of searching was conducted on the website versions of those three application stores and no variation was found.

3.2 Data Analysis

To examine if star rating and brand affiliation are associated with the visibility of hotels on smartphones, hotels were firstly divided into three sub-groups based on the average agency ratings provided by Hotels.com, Expedia.com and Booking.com (i.e., 3-star or below, 4-star and 5-star). Hotels in the study were also divided into two sub-groups based on brand affiliation (i.e., chain and independent). Afterwards, frequency analysis was carried out to exhibit the visibility of hotel websites and availability of smartphone apps across hotels with different ratings and brand affiliation. Moreover, a number of Chi Square tests were conducted to investigate the relationship between visibility of hotels on smartphones as well as star ratings and brand affiliation.

4 Results

4.1 Visibility of Hong Kong Hotel Websites on Smartphones

Since the star ratings of five hotels could not be identified from all three sources, only 117 hotels were included for analysis in this study. Table 1 exhibits the visibility of Hong Kong hotel websites on smartphones using different operating systems.

When these 117 hotel websites were browsed on the iOS smartphone, only one hotel website was found to be invisible. More than half were directed to mobile version (n = 68, 58.1 %), and another 41 % (n = 48) were directed to the desktop version. It is surprising that the only hotel that was invisible on the iOS smartphone was a 5-star hotel. Since that hotel website has many Flash-based applications, non-support for Flash and Java by iOS makes that website invisible on that device. The visibility of hotel websites on the Android smartphone is largely similar. Except one website owned and managed by a 4-star property, nearly all hotel websites were visible on either mobile version (n = 67, 57.3 %) or desktop version (n = 49, 41.9 %). Though the majority of hotels in Hong Kong have developed mobile websites for iOS and Android smartphones, the proportion of hotels supporting Windows Phones was relatively low. Among those 115 hotel websites that are visible on the Windows Phone smartphone, only 45.2 % (n = 52) were directed to the mobile version. In contrast, users are often directed to visit the desktop version (n = 63, 54.8 %). While smartphones are gradually becoming the primary Internet access device for travellers to research and purchase hotel accommodations, the findings reflect there is still a large group of Hong Kong hotels that did not acknowledge the potential usability problem of presenting desktop website on smartphones.

Regarding the association between the visibility of hotel websites on smartphones and star ratings, dissimilar findings were found across different operating systems. As shown in Table 1, the Chi Square test result suggests there was a significant association between star ratings and mobile website for iOS ($\chi^2(4) = 8.98, p < 0.1$). Another Chi Square test also reflects the association between hotel ratings and mobile website for Windows Phone was significant ($\chi^2(4) = 11.92, p < 0.05$). However, the association with mobile website for Android was found to be insignificant ($\chi^2(4) = 6.58$, *ns*). One interesting finding is that the proportions of 4-star hotels having mobile websites for iOS (47.8 %) and Android smartphones (47.8 %) were lower than those of 3-star hotels (iOS: 57.5 %; Android: 55.0 %). One possible reason for this phenomenon is that over 80 % (80.4 %) of 4-star hotels are affiliated with local hotel chains such as Harbour Plaza Hotels & Resorts and Sino Group of Hotels. In contrast, one third (35.0 %) of 3-star hotels are affiliated with international hotel chains such as Ramada Hotels and Best Western Hotels. Given that international hotel chains generally have the advantage in financial, human and technical resources (Barrows and Powers 2008), the corporate headquarters of international hotel chains may

Table 1 Visibility of Hong Kong hotel websites on smartphones

	Total (N = 117)	Star ratings[a]				Brand affiliation[b]		
		3-star (n = 40)	4-star (n = 46)	5-star (n = 31)	χ^2 [c]	Chain (n = 96)	Indp. (n = 21)	χ^2 [c]
iOS smartphone								
Mobile	68	23	22	23	8.98*	58	10	1.51
Website	(58.1 %)	(57.5 %)	(47.8 %)	(74.2 %)		(60.4 %)	(47.6 %)	
Desktop	48	17	24	7		37	11	
Website	(41.0 %)	(42.5 %)	(52.2 %)	(22.6 %)		(38.5 %)	(52.4 %)	
Invisible	1	0	0	1		1	0	
	(0.9 %)	(0.0 %)	(0.0 %)	(3.2 %)		(1.0 %)	(0.0 %)	
Android smartphone								
Mobile	67	22	22	23	6.58	57	10	1.31
Website	(57.3 %)	(55.0 %)	(47.8 %)	(74.2 %)		(59.4 %)	(47.6 %)	
Desktop	49	18	23	8		38	11	
Website	(41.9 %)	(45.0 %)	(50.0 %)	(25.8 %)		(39.6 %)	(52.4 %)	
Invisible	1	0	1	0		1	0	
	(0.9 %)	(0.0 %)	(2.2 %)	(0.0 %)		(1.0 %)	(0.0 %)	
Windows phone smartphone								
Mobile	52	15	18	19	11.92**	46	6	3.36
Website	(44.4 %)	(37.5 %)	(39.1 %)	(61.3 %)		(47.9 %)	(28.6 %)	
Desktop	63	25	28	10		48	15	
Website	(53.8 %)	(62.5 %)	(60.9 %)	(32.3 %)		(50.0 %)	(71.4 %)	
Invisible	2	0	0	2		2	0	
	(1.7 %)	(0.0 %)	(0.0 %)	(6.5 %)		(2.1 %)	(0.0 %)	

Note [a] *3-star* represents hotels with 3-star level or *below*; *4-star* represents hotels with 4-star level; *5-star* represents hotels with 5-star level

[b] *Chain* represents hotels affiliated with a hotel chain; *Indp.* represents hotels not affiliated with any hotel chain

[c] $*p < 0.1$; $**p < 0.05$

provide their affiliated hotels with more support in establishing mobile websites. This may partly explain the higher percentage of 3-star hotels having mobile websites. While the mobile website was found to be associated with hotel ratings, its relationship with brand affiliation was not confirmed regardless of the operating systems (iOS: $\chi^2(2) = 1.51$, *ns*; Android: $\chi^2(2) = 1.31$, *ns*; Windows Phone: $\chi^2(2) = 3.36$, *ns*).

4.2 Availability of Smartphone Apps Developed by All Hong Kong Hotels in Smartphone Application Stores

Based on the content analysis on hotel smartphone apps available in three smartphone stores, the findings exhibited that trend of developing smartphone apps was obscure in the Hong Kong hotel industry. As shown in Table 2, one third of

Table 2 Availability of smartphone apps of all Hong Kong hotels in smartphone application stores

	Total (N = 117)	Star ratings[a]				Brand affiliation[b]		
		3-star (n = 40)	4-star (n = 46)	5-star (n = 31)	χ^2 [c]	Chain (n = 96)	Indp. (n = 21)	χ^2 [c]
iOS smartphone								
App is Available	43 (36.8 %)	10 (25.0 %)	12 (26.1 %)	21 (67.7 %)	17.44***	40 (41.7 %)	3 (14.3 %)	5.56**
App is Unavailable	74 (63.2 %)	30 (75.0 %)	34 (73.9 %)	10 (32.3 %)		56 (58.3 %)	18 (85.7 %)	
Android smartphone								
App is Available	35 (29.9 %)	10 (25.0 %)	10 (21.7 %)	15 (48.4 %)	6.97**	33 (34.4 %)	2 (9.5 %)	5.076**
App is Unavailable	82 (70.1 %)	30 (75.0 %)	36 (78.3 %)	16 (51.6 %)		63 (65.6 %)	19 (90.5 %)	
Windows phone smartphone								
App is Available	5 (4.3 %)	2 (5.0 %)	0 (0.0 %)	3 (9.7 %)	4.32	5 (5.2 %)	0 (0.0 %)	1.143
App is Unavailable	112 (95.7 %)	38 (95.0 %)	46 (100 %)	28 (90.3 %)		91 (94.8 %)	21 (100 %)	

Note: [a] *3-star* represents hotels with 3-star level or below; *4-star* represents hotels with 4-star level; *5-star* represents hotels with 5-star level

[b] *Chain* represents hotels affiliated with a hotel chain; *Indp.* represents hotels not affiliated with any hotel chain

[c] $^{**}p < 0.05$; $^{***}p < 0.01$

Hong Kong hotels have developed smartphone apps for iOS smartphones (n = 43, 36.8 %). Despite the high market share of Android smartphones, the proportion of hotels having smartphone apps for Android is less than 30 % (n = 35, 29.9 %). For Windows Phone system, only five hotels (4.3 %) in Hong Kong were found to have compatible smartphone apps. As Windows Phone has a relatively short history comparing with that of iOS and Android (Kenlo 2012), hoteliers may avoid taking risk on making a significant investment on smartphone apps for this platform.

Same as the findings pertinent to visibility of hotel websites on smartphones, the results from Chi square tests exhibited that the association between the availability of smartphone apps and star ratings vary across different operating systems. To iOS smartphones, there was a significant association between the availability of smartphone apps and star ratings (χ^2 (2) = 17.44, $p < 0.01$). Table 2 also shows that the percentage of 4-star and 3-star or below hotels having smartphone app were 26.1 % (n = 12) and 25.0 % (n = 10) respectively, but the corresponding number of 5-star level hotels was as high as 67.7 % (n = 21). Similarly, another Chi Square test verifies the significant association between hotel ratings and the availability of apps for Android smartphones (χ^2 (2) = 6.97, $p < 0.05$). The availability rate of apps is relatively higher for hotels with 5-star level (n = 15, 48.4 %) than their counterparts with 4-star level (n = 10, 21.7 %) and 3-star level or below (n = 10, 25.0 %).

While brand affiliation was not associated with the visibility of hotel websites on smartphones, the empirical findings show there is a significant association between brand affiliation and the availability of smartphone apps. According to the "Brand affiliation" column in Table 2, the proportion of independent hotels having smartphone apps for iOS and Android smartphones was 14.3 % (n = 3) and 9.5 % (n = 2), respectively. Yet, more than one third of chain hotels had their smartphone apps for iOS (n = 40, 41.7 %) and Android smartphones (n = 33, 34.4 %). The results from another two Chi Square tests also suggest that brand affiliation were significantly associated with the availability of apps for iOS devices (χ^2 (1) = 5.56, $p < 0.05$) and Android devices (χ^2 (1) = 5.08, $p < 0.05$).

5 Discussions and Conclusions

Over the last few decades, information and communication technologies offer travellers a wide range of tools to facilitate and improve travellers' decision making process (Buhalis et al. 2011). In the post-personal computer era, this trend continues as travellers are now equipped with cutting-edge smartphones. As many people now spend more time online on their smartphones than on their computers (Kao 2013), hotel and tourism suppliers have to devise their online marketing tools and practices in order to enhance their visibility on smartphones and gain a share of the burgeoning online market.

Being one of the two proxies representing the visibility of hotels on smartphones, empirical findings in this study revealed that hotels in Hong Kong generally acknowledge and adapt to the smartphone wave by developing mobile websites for promoting, distributing, and connecting with consumers on different smartphone platforms. Yet, the exploitation of smartphone technology in the Hong Kong hotel industry is still not prevalent. As noted by Gil (2013), most desktop websites are designed for desktop monitors with 19-inch to 24-inch diagonal size. Browsing a desktop website on a smartphone with a typical 4-inch diagonal size would make the text unreadable, and eventually make a website less user-friendly. Au Yeung and Law (2004) posited that unpleasant online experiences would inevitably lead to a reduction of online sales and a loss of potential customers. It would eventually have a negative effect on the credibility of the hotel company. Since a "user-unfriendly" website would discount consumers' interest to view, purchase and re-enter it (Hasan and Abuelrub 2011), hoteliers and developers of hotel websites are necessitated to assure that their websites are smartphone-friendly and thereby able to accessible to a much larger audience. Comparing with the proportion of hotels having mobile websites, the trend of developing smartphone apps in the hotel industry is relatively less eminent. Only a handful of hotels in Hong Kong have developed their apps for smartphone platforms in general and for Windows Phone smartphones in particular. Apparently, the development cost of smartphone apps is much higher than that of mobile websites. But since smartphone users' preference is strongly in favour of smartphone apps over mobile

websites owing to their high usability (Moth 2013), there is more than enough evidence for hotels to develop their smartphone apps for distributing products to and creating a close connection with current and potential customers.

Besides exhibiting the trend of developing mobile websites and smartphone applications, this study exhibits a significant association between star ratings and mobile websites (for iOS and Windows Phone smartphones) as well as smartphone apps (for iOS and Android smartphones). Chain hotels were more likely to invest on mobile technology and develop smartphone apps than their independent counterparts. Though previous studies generally suggested that brand affiliation plays a tremendous role on the hotel's inclination towards technology adoption (Siguaw et al. 2000), website design quality (Au Yeung and Law 2004) and website information quality (Leung et al. 2013), to our knowledge, this study is the first attempt examining the association between brand affiliation and the visibility of hotels on smartphones. Au Yeung and Law (2004) posited that the discrepancy in the website usability performance could be explained by the difference in financial and technical support between chain and independent hotels. Future research may further explore whether the difference in financial resources may explain why chain hotels are capable of building different mobile interfaces in order to enhance the mobile presence for their companies.

Despite the insightful implications, this study has several limitations. First, as only member hotels of the Hong Kong Hotels Association were consulted and cross-sectional data collected in July 2013 were analysed, the generalizability of this study's findings may be limited. Besides, as other mobile operating systems, particularly BlackBerry OS by BlackBerry and Symbian by Nokia, were excluded for analysis in the current study, this study cannot claim to be widely generalizable. To redress these limitations, a natural extension of this study is to analyse hotels in other countries and different types of mobile devices should be included for analysis. Examining the quality of mobile websites and smartphone apps owned and managed by hotel companies is another direction for future research. Since the adoption of mobile websites and smartphone apps vary across hotels with different star ratings and brand affiliation, qualitative research examining the factors contributing to the difference in the adoption may certainly benefit researchers and practitioners to realise hoteliers' rationales of adopting mobile technologies.

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Mobile Devices as a Tourism Distribution Channel: Perceptions of Visitors to National Parks in South Africa

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Abstract The use of mobile devices in the tourism industry is growing and travellers' intentions or willingness to use them for specific purposes need to be recognised. This study looks at visitors' support of South African National Parks' (SANParks) mobile website for booking purposes, their level of satisfaction with the interaction and their propensity to adopt a mobile application, should SANParks provide one. It also investigates what visitors deem important in mobile devices. The results confirmed that mobile devices as a booking channel for SANParks is still in its initial stages, with relatively few visitors having used the SANParks mobile website or any type of mobile application. The results also indicated the level of satisfaction that visitors experience with the SANParks mobile website, and features they deem important when using mobile applications for accommodation bookings.

Keywords Distribution channels · Mobile applications · Mobile websites · Nature based organisation · SANParks · South Africa

1 Introduction

The use of mobile devices (such as hand-phones, personal digital assistants (PDAs) and handheld computers) has grown significantly in recent years, and when compared to traditional channels (both offline and online) these devices

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serve as an alternative channel of information, providing travellers with more choices while at the same time changing the way in which information-related activities are conducted. By using their handheld devices, users can browse the web, monitor emails, read news, do bookings and make transactions. Mobile devices have also enabled suppliers to adjust promotional messages faster than through traditional media (Lee and Mills 2010).

A number of research studies have been conducted on the use of mobile devices in the tourism industry (Rasinger et al. 2007, 2009; Lee and Mills 2010; No and Kim 2013), with a few having investigated how mobile devices are used to distribute the tourism product (Wang and Wang 2010; Christou and Kassianidis 2010). Wang and Wang (2010) found that where travellers' perceived innovative mobile features it significantly influenced their choices and practices in adopting mobile devices. They also identified two more dimensions that determine travellers' choices in adopting mobile devices namely compatibility with a person's values and previous experience with the product category. The results of Christou and Kassianidis (2010) showed that perceived value was a predictor in explaining customers' adoption of mobile devices when making hotel reservations and perceptions of information quality and system quality were the two critical components significantly influencing perceived value of mobile hotel reservations. No and Kim (2013) recognised a need to investigate travellers' intentions or willingness to use mobile devices since, despite numerous studies on information technologies in tourism, only a few attempts to successfully clarify travellers' acceptance and usage of mobile devices have been made.

A distinction must be made between mobile websites and mobile applications. A mobile website is comparable to any other website in that it is made up of browser-based HTML pages that are interconnected and accessed via the Internet (for mobile typically WiFi or 3G or 4G networks). The obvious feature that differentiates a mobile website from a standard website is the fact that it is intended for the smaller handheld display and touch-screen interface. Similar to any website, mobile websites can show text content, data, images and video while also accessing mobile-specific characteristics for example location-based mapping. Mobile applications are actual applications that are downloaded and installed on a mobile device, instead of being rendered within a browser. Users access device-specific portals for instance Apple's App Store, Android Market, or Blackberry App World with the purpose of locating and downloading applications for a particular operating system. The application may access content and data from the Internet, similar to a website, or it may download the content to be accessed without an Internet connection (Summerfield 2011). Lewis says that travel is the seventh most downloaded application after planning, photography, social, deals and bookings, maps/navigation (mainly offline maps), TripIt, itinerary planning and recommendations (Mickaiel 2011). Statistics from TripAdvisor support this, by indicating that 60 % of mobile device users downloaded travel applications, while 45 % used the applications to arrange and find information on their trips (Mickaiel 2011).

The purpose of this study is to assess the use of mobile devices to make reservations at a nature-based organisation in South Africa (SANParks) and to determine their level of satisfaction with the mobile website as well as their propensity to use a mobile application, should SANParks provide one. The study also identifies the features which visitors deem important when transacting via mobile devices with SANParks, and ascertains whether significant relationships exist between visitor characteristics and the level of use of mobile devices. The paper has four parts: First it reviews the extant literature relevant to distribution of tourism services using mobile devices, then the research methodology is presented and data analysis techniques discussed. Finally, the findings are discussed and summarised.

2 Tourism Distribution and Mobile Devices

According to Buhalis (2001, p. 8): "The primary distribution functions for tourism are information, combination and travel arrangement services. Most distribution channels therefore provide information for prospective tourists; bundle tourism products together; and also establish mechanisms that enable consumers to make, confirm and pay for reservations". Distribution channels range from traditional offline channels to various online channels and platforms (both desktop and mobile), which include, amongst others, supplier websites, online intermediaries, consolidators and social media. Due to the increasing importance of mobile devices in the market, their use for tourism distribution and the extent to which suppliers and customers interact via this channel must be recognised. The effectiveness of any tourism distribution channel lies in its ability to perform all the distribution functions related to traveller buying behaviour as shown in Table 1 so as to achieve specific communication objectives from creating awareness, providing information for knowledge and comprehension, stimulating interest and creating choices through product bundling, to persuasion to purchase and provision of transaction capability.

A number of studies have confirmed that mobile devices have a significant impact on the travel cycle, and offer opportunities to support tourists in every phase of information search (Kenteris et al. 2009; Brown and Chalmers 2003), while also having an influence on their travel choices (Kramer et al. 2007). The supplier has the advantage that mobile communication offers an opportunity to communicate directly with consumers anytime and anywhere. Mobile services offer a number of benefits such as high availability, being able to use e-commerce services irrespective of time or place and movability and location awareness capabilities (Siau et al. 2001; Varshney and Vetter 2002). Due to less transportation, waiting and planning time, mobile shopping is quicker than in-store shopping and this provides travel suppliers with new ways to improve customer loyalty, create additional income sources and decrease operational costs (Kim et al. 2008). According to SA Tourism's estimations, more than 30 % of all

Table 1 Tourist buying behaviour

Buying process stages	Communication objectives
Awareness, attention	Exposure
Knowledge, comprehension	Transmission of information
Attitudes, interest, liking	Attitude change
Evaluation, preference, desire	Creation of preferences
Intention, conviction	Initiation of action
Purchase, trial, action	Purchase
Adoption	Repeat purchase

Source Adapted from Mill and Morrison (2006)

travellers have downloaded an application related to travel on their mobile devices, and these applications range from getting transport and locating tourist attractions, to sharing experiences through social media platforms. With these figures in mind, tourism suppliers are increasingly looking at using mobile devices to communicate with their travellers. According to Jeff Lewis, Vice President of Engineering at Viator in the USA, an online retailer of day trips and tourist attractions, suppliers who are dependent on the internet for business must adapt their offerings to suit mobile devices instead of desktop PCs, or stand a chance to lose business, Lewis adds that customers are moving away from computers and are rather using mobile devices, and predicts that suppliers who will still be using internet on computers in two years' time will be attending to the minority of users. He pointed out that a quarter of mobile web users in America do not even own computers (Mickaiel 2011). This prediction that only a minority of users will still be using computers in 2 years' time should be tested in different settings as it may not be a realistic prediction, even in the USA.

While other industries view mobile communication as yet another convenience to consumers, for the tourism industry, mobile commerce is a vital ingredient of the travellers' complete travel experience (Eriksson 2002; Schmidt-Belz et al. 2003). M-commerce provides the benefits of the Web, but also permits for distinctive services made possible by the merging of the Internet with mobile technology. M-commerce for travel services has, when compared to in-store travel agency shopping, two core benefits. First, it provides travellers with a higher level of convenience (Lin and Wang 2006; Mallat et al. 2008) since they do not encounter any transportation or physical barriers as they can conduct the transaction and book tickets and receive confirmations from the comfort of their home or anywhere else (even on the move and while travelling). Second, on-line reservations and check-in over a mobile device save travellers time (O'Connor and Frew 2001; Sigala 2006).

Mobile interaction with a supplier at any point during the travel cycle should enhance the customers' travel experience. According to No and Kim (2013), travellers who are content with the experiences they have had with travel websites, are keen to look for travel activities information by making use of their mobile devices for their trips. Mobile devices combine the characteristics of computing

and mobile telephony. They explain that since mobile devices "have the same or similar features of computer networks, theories or models which explain the phenomena on the computer network, might be applicable to the situations on the smartphones". This parallel is applicable to tourism websites as well. Factors deemed important when finding tourist information are the same, whether using a mobile device or a tourism website, and thus the research on factors deemed important when using a tourism website, can also be used to explain factors important when using a mobile device. Information quality has to do with the quality of information presented on the system. Delone and McLean (2003) say that the information on a web system should be personalised, complete, relevant, easy to understand and secure if potential buyers are to make transactions through the web. Wang and Wang (2010) add that the information should be detailed, timely, accurate, reliable and selective in order for travellers to make a comparison between alternatives, make bookings and make more appropriate buying decisions. Travellers' satisfaction with websites can be measured in various ways, one of the most well-known is the E-SAT model developed by Mills and Morrison (2003) where they identified characteristics of e-consumer satisfaction with travel websites based on three main constructs: travel website interface (TWI), the perceived quality of a travel website (PQTW) and the perceived value of a travel website (PVTW). TWI is defined as: "the means by which the consumer interacts with the travel website and includes first-order factors such as access, loading, appearance, navigation, interactivity, search, and security". PQTW is defined as: "the consumer's opinion of the overall excellence of travel website services and includes first-order factors such as incentives, feedback, and information reliability". Lastly, PVTW is defined as: "the consumer's overall assessment of the utility of travel website services and includes first-order factors such as involvement, shopping convenience, transaction utility, and price" (Mills and Morrison 2003).

Kim et al. (2008) suggest that the needs of travellers using mobile devices have more to do with the perceived usefulness of the device (i.e., convenience, effectiveness and productivity) than the device's ease of use (e.g., interaction with the devices and ease of use). They appeal to industry marketers to pay close attention to the need for effective functionalities and an extensive array of mobile services in tourism and hospitality locations, especially with frequent travellers', who have a higher inclination to make use of mobile devices (Kim et al. 2008). They suggest that marketers of travel and tourism services should use mobile technology as an important feature when enticing frequent travellers because this will make their properties and facilities more attractive, appropriate, effective, and significant. Other factors also influence a traveller's willingness to use a mobile device for travel activities. These include demographics for example age, culture, and personality traits, technological self-efficacy, and the apparent importance of mobile applications to travellers (Lubbe and Louw 2010). Lubbe and Louw (2010) further postulate that there is a significant correlation between a traveller's "mobile readiness" and the mobile device's perceived value across the travel cycle, and that "mobile readiness" is also correlated to the purpose of the trip and the frequency of travel.

The overall aim of this study is to determine the use of mobile devices by travellers to seek information and transact with a specific organisation and their perceptions of their experience in this regard. The selected organisation is South African National Parks (SANParks) which has a mobile website on which visitors can make bookings. SANParks is the leading environmental conservation authority in South Africa, and acts as the umbrella organisation responsible for 20 National Parks covering 3,751,113 hectares of protected land. In the first 10 years of democracy, SANParks focused on making the parks more accessible for visitors while contributing to the economic and social development of the rural and local areas. SANParks has three main aims; firstly, the conservation and protection of various samples of the biodiversity of the country. Secondly, to maintain a relationship between the community and the parks which will lead to social upliftment and thirdly, to provide a recreational hub for visitors to experience and enjoy the natural environment provided by the parks.

Apart from determining the level of use of mobile devices in interacting with SANParks, the study also aims to determine visitors' level of satisfaction when using mobile devices to transact with SANParks, identify the features which customers deem important when transacting via mobile devices with SANParks, and ascertain whether significant relationships exist between visitor characteristics and use of mobile devices.

3 Methodology

Past visitors to SANParks, who had made use of their distribution channels, were selected. A self-administered, web-based questionnaire was developed and the link to the questionnaire posted on the SANParks website, with an invitation to participate in the research. In total, 418 usable responses were gathered from the online survey. Paper-based questionnaires were also distributed at the head office walk-in reservation office, as well as a satellite walk-in reservation office where 121 paper-based questionnaires were collected, which resulted in a total number of 539 responses. The purpose of the questionnaire was to determine the effectiveness of all the distribution channels used by SANParks, including their mobile website. In this paper, the results of only two areas of investigation covered in the questionnaire will be discussed: interaction with SANParks' mobile website and the extent to which respondents used any type of mobile accommodation application. Data were analyzed using frequency analysis and measures of central tendency and dispersion to determine the visitors' experience with these channels. Chi square tests were done to investigate relationships between variables of which only those that proved significant are reported in this paper.

Table 2 Respondents' profile

Profile	Percentage	Profile	Percentage
Gender		*Frequency of visits*	
Male	50	More than once a year	65.34
Female	50	Once a year	30.46
Age		I haven't stayed at any of the SANParks in the last 2 years	3.57
18–35	17.17	I haven't stayed at any of the SANParks in the last 5 years	0.63
36–50	31.11		
51–60	24.68		
Over 60	27.04		

4 Data Analysis and Results

A description of the profile of respondents is presented in Table 2. An equal number of males and females responded to the questionnaire. All adult age groups were represented in the sample, and almost all respondents visit one of the SANParks at least once a year.

One of the objectives of the study was to measure the extent to which mobile devices are currently being used as a distribution channel when making a reservation with SANParks, and so the first question asked respondents to indicate whether they are aware of the fact that SANParks has a mobile website. Only 139 respondents answered this particular question and of these 32 % said that they were aware that SANParks had a mobile website. Thirteen percent of the total number of respondents said they had used the mobile website to make a SANParks reservation before. A second objective was to ascertain the level of satisfaction that respondents currently experience with the SANParks mobile website and these results are presented in Table 3. Most respondents (81 %) were satisfied with finding the mobile webpage with fewer (68 %) being satisfied with the credibility of the reservation channel and finding the online booking facility. Approximately 62 % were satisfied with ease of payment, availability of information and time taken to make the reservation. Most respondents were neutral or dissatisfied with aspects (unrelated to the website) such as price of accommodation and accommodation availability.

The third objective related to mobile applications, and visitors' general use of it. Although SANParks does not currently have a mobile application, respondents were asked whether they would use such a facility should SANParks decide to provide one. Thirty percent of respondents said they would make use of the application to facilitate reservations, 28 % said no, and 42 % were unsure. Respondents were then asked whether they have ever made use of an application to book any accommodation and of the 473 who responded 13 % agreed, 79 % disagreed, and 8 % were unsure. The respondents, who had used a mobile application before to make accommodation bookings, were requested to indicate the features that they deem important when making an accommodation booking via a mobile application, with the results indicated in Table 4. As can be seen from

Table 3 Level of satisfaction with SANParks mobile website

	Very satisfied/ Satisfied	Neutral	Very dissatisfied/ Dissatisfied	Mean	Std dev	Mode
Finding the SANParks page	81.81	18.18	0	1.82	0.72	2.00
Reputation (credibility of reservation channel)	67.85	32.14	0	2.09	0.75	2.00
Ease of finding the SANParks online booking facility	67.85	28.57	3.67	2.13	0.81	2.00
Security of payment process	66.07	33.93	0	2.13	0.74	2.00
Simplicity of self-help process	64.29	33.93	1.79	2.16	0.78	2.00
Recognition of your personal details	64.29	33.93	1.79	2.16	0.78	2.00
Ease of payment process	62.50	33.93	3.57	2.18	0.83	2.00
Information available on the mobile site	62.50	35.71	1.79	2.20	0.77	2.00
Time taken to make the reservation	62.50	33.93	3.57	2.23	0.79	2.00
Availability of accommodation	41.07	42.86	16.07	2.70	0.93	3.00
Price of accommodation charged	37.50	41.07	21.43	2.80	0.94	3.00

Note n = 55 for "Finding the SANParks page"; n = 56 for other dimensions

Table 4 Features deemed important when using a mobile application

	Very important/ Important	Neutral	Very unimportant/ Unimportant	Mean	Std dev	Mode
Quality of information n = 65	96.92	1.54	1.54	1.29	0.65	1.00
Ease of navigation n = 65	92.30	6.15	1.54	1.35	0.74	1.00
Ease of use n = 66	93.94	1.52	4.55	1.36	0.85	1.00
Interaction and engagement n = 65	84.61	13.85	1.54	1.69	0.83	1.00
Price of application n = 65	78.46	15.38	6.16	1.74	0.99	1.00

the results the overwhelming majority of respondents who actually have used mobile applications before agreed that the quality of information, ease of navigation and use, ability to interact and engage as well as price of the application were very important to facilitate use.

Chi square tests were then conducted to ascertain the relationships between certain identified variables. The first test aimed to establish whether a relationship exists between a customer's skill in using the internet and their use of the mobile website to make a reservation with SANParks. Table 5 shows the results at a probability greater than 95 % ($p < 0.0338$) thus a significant relationship exists.

Table 5 Skill in using the internet versus use of mobile website for reservations with SANParks

Level of skill	Use of mobile website		
	Yes	No	Total
Low skill			
Frequency	10	125	135
Percent	2.19	27.35	29.54
Row percent	7.14	92.59	
Column percent	17.54	31.25	
High skill			
Frequency	47	275	322
Percent	10.28	60.18	70.46
Row percent	14.60	85.40	
Column percent	82.46	60.75	
Total			
Frequency	57	400	457
Percent	12.47	87.53	100.00

Table 6 Skill in using the internet versus willingness to use SANParks mobile application (if they had one)

Level of skill	Willingness to use SANParks' mobile application			
	Yes	No	I don't know	Total
Low skill				
Frequency	25	44	64	133
Percent	5.47	9.63	14.00	29.10
Row percent	18.80	33.08	48.12	
Column percent	17.99	35.48	32.99	
High skill				
Frequency	114	80	130	324
Percent	24.95	17.51	28.45	70.90
Row percent	35.19	24.69	40.12	
Column percent	82.01	64.52	67.01	
Total				
Frequency	139	124	194	457
Percent	30.42	27.13	42.45	100.00

Table 6 shows that a customers' skill in using the internet is significantly related ($p < 0.0023$) to their willingness to use mobile applications had SANParks had this facility.

A correlation was also drawn between a customer's level of internet skill and their use of mobile applications to make accommodation bookings and the results are presented in Table 7 which shows a significant association ($p < 0.0088$) between the level of internet skill of a customer and their use of mobile applications to make accommodation bookings.

Table 7 Skill in using the internet versus use of mobile applications for accommodation bookings

Level of skill	Use of mobile application			
	Yes	No	I don't know	Total
Low skill				
Frequency	8	113	15	136
Percent	1.74	24.57	3.26	29.57
Row percent	5.88	83.09	11.03	
Column percent	13.56	31.13	39.47	
High skill				
Frequency	51	250	23	324
Percent	11.09	54.35	5.00	70.43
Row percent	15.74	77.16	7.10	
Column percent	86.44	68.87	60.53	
Total				
Frequency	59	363	38	460
Percent	12.83	78.91	8.26	100.00

Table 8 Use of mobile website versus willingness to use mobile applications

Use of mobile website	Use of mobile application			
	Yes	No	I don't know	Total
Yes				
Frequency	36	11	11	58
Percent	7.83	2.39	2.39	12.61
Row percent	62.07	18.97	18.97	
Column percent	25.71	8.46	5.79	
No				
Frequency	104	119	179	402
Percent	22.61	25.87	38.91	87.39
Row percent	25.84	29.60	44.53	
Column percent	74.29	91.54	94.21	
Total				
Frequency	140	130	190	460
Percent	30.43	28.26	41.30	100.00

Subsequently, we checked to see whether a customer using the SANParks mobile website to make accommodation bookings, would also be willing to use a mobile application to make bookings if SANParks had one. The results showed a significant correlation at a p value <0.0001 (Table 8).

5 Discussion and Conclusion

This study determined the extent to which visitors to a nature-based organisation, more specifically South African National Parks (SANParks), uses mobile devices in their distribution activities. The study looked at both the use of the mobile website by visitors and the propensity to use a mobile application as a booking channel, should SANParks provide such an application, The study also measured customers' level of satisfaction with using the mobile website to transact with SANParks and identified the features which customers deem important when transacting via mobile websites and mobile applications.

In so far as the extent of the use of mobile devices is concerned the results of this study seems contrary to those of particularly industry-related sources. It has been predicted by a number of industry sources that the use of mobile devices will quickly overtake the use of desktops for travel-related activities such as bookings. One of these already mentioned was Viator in the USA (Mickaiel 2011). Another is Google who predicted in 2012 that the number of mobile users using their devices to find travel information, would have grown more than 50 % by the end of 2012 (Engineernews 2012). Oxygen8 Group, a global provider of integrated mobile solutions, also reported that 67 % of frequent leisure travellers have made use of their mobile device to locate local services, while a quarter of mobile device users have used their device to make a hotel booking (Oxygen8 2013). In our research only 13 % of respondents had used the SANParks mobile website before and a further 13 % stated that they had made use of a mobile application before to make an accommodation booking. As mentioned in the literature overview, Mills and Morrison (2003) identified characteristics of e-consumer satisfaction with travel websites based on three main constructs: travel website interface (TWI), the perceived quality of a travel website (PQTW) and the perceived value of a travel website (PVTW). Our results showed that respondents were most satisfied with the TWI, in other words how easy it was to find the SANParks mobile webpage, followed by the reputation of the booking channel and the ease of finding the online booking facility on the mobile page, and least satisfied with the PVTW, relating to time it took them to make the mobile reservation, the availability of accommodation on the site, and the price of accommodation charged on the mobile page. According to No and Kim (2013), travellers who are content with the experiences they have had with travel websites, are keen to look for travel activities information by making use of their mobile devices for their trips. Results from our research confirm this by showing significant relationships between a traveller's skill in using the internet and their use of mobile websites and mobile applications respectively.

Should SANParks decide to implement a mobile application, there are several technical/commercial aspects to consider, some of which are (Hsieh 2007): an application is about integration and cooperation, good product design is imperative, it is important to consider how and when users will be charged for using the application, it is vital to understand the needs of the user and what the application

will be used for, security and privacy is vital- for applications that involve monetary transactions and personal data transmissions, security is always the prime consideration and lastly, separation of enterprise data from personal data is critical.

In reviewing the results it must be mentioned that while a fairly large response was received for the entire questionnaire, the sections on the use of the mobile website and mobile applications received far fewer responses. This response rate, while valuable in pointing to the frequency of use (and non-use) of mobile devices must be taken into account when viewing the results, particularly pertaining to the satisfaction aspects of the questionnaire. Nevertheless, this study does confirm the needs of travellers in terms of requirements from mobile devices and aid tourism suppliers in developing their mobile strategy more effectively to meet the needs of travellers. The findings of this study cannot be generalisable to the global population of visitors who use mobile devices for accommodation bookings as the sample was non-random. The findings do nonetheless show some significant trends that could indeed probably be an indication of the needs and satisfaction levels of the global population of visitors who use mobile devices for accommodation bookings.

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A Web Platform to Generate and Deliver Mobile Web Contents Without Programming Skills

David Martín, Ortzi Torices, Hugo Salas, Carlos Lamsfus and Aurkene Alzua-Sorzabal

Abstract The massive adoption of smartphones and the increasing popularity of QR codes to access mobile web sites are motivating the creation of new tools to generate these kinds of contents. This is especially important in information-intensive industries such as the tourism sector, where visitors consume tourism information and services everywhere with their smartphones. This way, it is essential to empower tourism stakeholders with tools in order to be self-sufficient to generate tourism web contents adapted to mobile devices. This paper presents a web platform designed for people without programming skills. The platform allows the creation and delivery of mobile web contents using QR codes. The results of the user evaluation process are discussed and some guidelines to develop these kinds of toolkits are detailed as well.

Keywords QR · Mobile · Web · Tourism

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1 Introduction

The recent advances in mobile technologies and their rapid adoption worldwide, enable the creation of new ways of interaction between mobile users and their environment. According to Gartner (Pettey and van der Meulen 2010), in 2013 the number of smartphones will exceed 1.82 billion all over the world.

In addition to this, the communication technologies and Internet connectivity have significantly been improved in mobile environments. Mobile Internet data coming from mobile devices already exceeds 13 % of the overall traffic (Cisco 2013). Furthermore, this traffic increased 70 % in 2012 and it is expected to be 13 times higher in 2017, with more than 10 billion connected mobile devices (Cisco 2013).

The tourism industry needs to be aware of this new reality (Gretzel 2011). Nowadays, visitors can access information and services with their mobile devices at any time and place (Wang et al. 2012). This implies that tourism web contents have to be adapted to these kinds of devices. Also, it has to be taken into account that the mobile environment is radically different from a desktop one (e.g. mouse, screen size and keyboard). This means that the access to mobile web contents has to be eased and adapted.

In this sense, the usage of QR codes in order to access mobile web sites is increasing in recent years. For instance, the amount of European smartphone users who scanned a QR code with their mobile devices grew 96 % over 2011, with 17.4 million users in July 2012 (Mohamud 2012).

The aim of this research work is to evaluate if non-technical people are self-sufficient to create mobile web contents. This way, a web platform has been designed and implemented to support individuals without programming skills to create mobile web contents, that is, contents that can be adapted to the screen size of any smartphone or tablet in order to ensure a good user experience (Höpken et al. 2010). This approach enables tourism stakeholders such as hotels, shops, restaurants or tourism offices, to create web contents (e.g. promotions, information and discounts) adapted to mobile devices and to deliver them using QR codes.

Most of the existing platforms to generate mobile web sites are designed for programmers and their use may be difficult for non-technical people. Apart from that, not all of these tools use QR codes in order to properly deliver the created web sites to people on the move. Thus, the proposed approach also provides tourism stakeholders with an analytics layer that obtains the location of mobile users when a QR code is scanned. The platform has been tested with real users, both programmers and non-programmers, in order to evaluate the usability of this approach.

The paper is organized as follows. In Sect. 2, the related work is discussed. Section 3 contains the description of the architecture and the functionalities of the platform. Section 4 describes the methodology and the results of the user evaluation. Finally, the paper concludes with some guidelines for the development of these kinds of systems and brief concluding remarks.

2 State of the Art

QR codes have been widely used in the tourism industry (Canadi et al. 2010) in order to provide additional information of points of interest (Alshattnawi 2012), events (Chen and Weng 2010) or exhibits (Emaldi et al. 2012). The advantage of using a QR code to deliver content is that it can easily be read by any smartphone. Apart from that, these kinds of two-dimensional codes usually offer information related to the location, the thing or being they are stuck in. The challenge here is to promote the creation of mobile contents by tourism domain stakeholders in order to be delivered using QR codes.

In this sense, End-User Development (EUD) (Lieberman et al. 2006) research field defines some methods and techniques to ease the creation and modification of software components by non-programmers. In addition, previous research works evidence that the involvement of people without programming skills in the development of software systems is possible and desirable (Martín et al. 2013).

Several tools have been implemented in order to enable users to create mobile web sites without programming skills. For instance, Microsoft created TouchDevelop (Athreya et al. 2012) in order to develop mobile applications using a simplified scripting language that can be learned by non-technical people. Another example is MIT App Inventor (MIT Centre for mobile learning 2012), a platform that empowers users to implement Android applications using the puzzle metaphor (Danado and Paternò 2012). This technique simulates the different functionalities, controls and content types that are available to the system designer in order to be mixed and create an application. Other approaches like TapCanvas (2013), are based in predefined web site templates that the user can modify. These kinds of platforms are less flexible than others because its structure is predefined. Other platforms like AppFurnace (Calvium 2011), are designed to be used by both non-technical users and programmers because it allows the modification of the generated source code.

The main drawback of these approaches is that users still need some technical skills in order to create mobile contents, which can be quite confusing and challenging for people without technical skills. Apart from that, none of them has an integrated functionality to deliver the generated contents using QR codes.

This research work proposes a mobile web page creation platform specifically designed for non-technical people. The platform also allows the creation of a QR code in order to ease the access to the designed mobile web page. The next section describes the implemented system.

3 Description of the Platform

The implemented platform, which is called qrrrify, allows the creation of mobile web pages in order to provide visitors with travel and tourism information (e.g. points of interest, restaurant menus and hotel service descriptions). These web sites

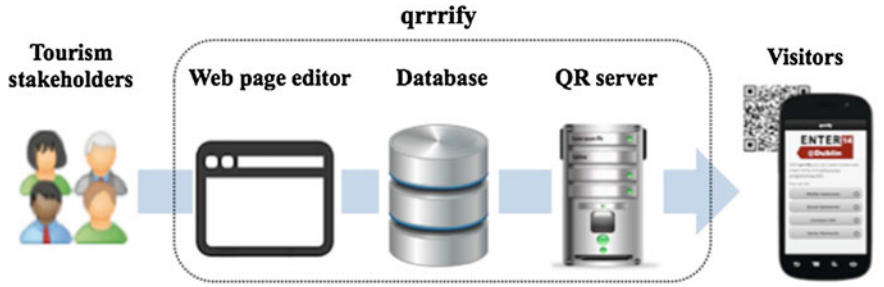

Fig. 1 Architecture of the platform

can then be accessed scanning a QR code that the platform generates. This way, the consumption of information can be easier for visitors on the move.

The architecture of the platform (Fig. 1) is composed of three main modules: the web page editor, the database and the QR server. Tourism stakeholders can use the page editor to create and manage mobile web sites and obtain the QR codes to access them. The editor is designed to compose a web page without coding any programming line. The database stores the information of the platform users and the created web pages. It also stores the location of visitors every time they scan a QR code. This information can then be analysed in order to obtain visitor mobility patterns. Finally, the QR server manages the access to the generated web pages.

As mentioned before, the platform has been designed for people with no programming skills. This way, the web page editor provides users with a visual environment to compose mobile web pages. As shown in Fig. 2, the web page editor is made up of three main areas. The left side of the editor shows the elements that can be used in order to design a web page. In the right side of the screen the selected web element can be edited.

All the elements that are used to design a web page and the changes that are performed in such elements are reflected in real-time in the middle of the web page editor. Here, the user can see a preview of the designed page. This is helpful for non-technical users because they can preview the designed page in the mobile device emulator that is provided with the platform.

The tourism product is intangible (Werthner and Klein 1999), so it is important to provide a vast variety of web elements in order to enrich the information that visitors consume with their mobile devices. This way, the platform provides users with multimedia components such as images, audio and video. Also, text resources are available, like headers, footers, paragraphs or titles.

Apart from that, social networks are gaining popularity as an alternative source of tourism information (Sigala et al. 2012). Visitors are increasingly adopting them in order to search for products or as a recommendation source. This way, the web editor provides users with social media web elements in order to embed Facebook and Twitter widgets in the created mobile web pages. These components connect

Fig. 2 Mobile web page editor

tourism stakeholders with visitors on the move and they can be used as a social recommendation channel.

Telephone and email contact elements can be added to the designed mobile web pages as well. Another important feature that can be used is the map editor. This tool supports the creation of custom maps where different tourism resources can be placed.

Finally, one of the most powerful features is the web page linking editor. The users of the platform can create as many web pages as they want, linking them each other with this editor. This way, users can create a simple web flow between different pages in order to offer more detailed information.

Once the mobile web page has been designed, a QR code can be obtained like the one in Fig. 3. This QR code can be scanned in order to quickly access the designed web page. The system also gathers the location of the visitor that scans the QR code and it stores the number of times that it is scanned. These data can be used to obtain mobility patterns, analysing the most visited places, the most checked information and the location of the visitors on the move.

Fig. 3 Example QR code

4 Evaluation

In order to test whether the implemented platform can be suitable for people without programming skills, a user evaluation has been designed. Next sections describe the methodology and the results of the user evaluation.

4.1 Methodology

The platform has been evaluated with 20 people. Half of the participants were technical users, that is, they had programming skills, while the rest of the participants were non-technical users. The evaluation has been focused on the measurement of the usability of the platform. The System Usability Scale (SUS) (Brooke 1996) has been used because it is the most used questionnaire for measuring perceptions of usability.

This way, participants had to complete four tasks using the platform, where they had to design four different mobile web pages. An external observer annotated all the problems that the participants found using the platform. Also, once a task was finished, the time spent in its configuration was annotated. The main objectives of the designed tasks were the following.

- First task. To evaluate the proper usage of some of the web elements (image, text, map, social media widget and contact buttons) in order to create a simple mobile web page.
- Second task. To evaluate the adaptation of the user to the platform, considering the basic skills achieved by the user after completing the first task, and to test the reusability of the previously created web page.
- Third task. To test the web page linking functionality with the previously created web pages.
- Fourth task. To evaluate the general performance of the platform. This way, users had to create a personal web page with the tool.

Table 1 Average rating of tasks

	Non-technical		Technical	
	First	Second	First	Second
T1	50.80	66.50	74.10	71.40
T2	38.80	52.80	70.60	71.40
T3	44.00	62.00	77.80	84.00
T4	49.00	68.40	74.00	76.00
Average	45.65	62.43	74.13	75.70

After the evaluation, the external observer calculated the completion level of the tasks based on a 100 points scale. These points were assigned based on the used web elements and the carried out actions in each of the tasks. 50 points were considered as a sufficient score to mark the task as completed, based on the weights that were assigned to the different subtasks that participants had to carry out in order to successfully complete a task.

This evaluation process was divided in two stages. In the first stage, an early prototype of the platform was evaluated with 10 participants, 5 technical users (programmers) and 5 non-technical users (people from the tourism industry). With the conclusions of this first stage, some improvements were made in the prototype and it was evaluated again with the rest of the participants.

The improvements of the second version were focused on the redesign of the layout of the user interface. Also, some changes were made in some of the functionalities of the platform that were confusing for the users. The error alert messages were improved as well.

4.2 Results

The results of the evaluation have been analysed based on the level of completion of each of the tasks, the time spent to finish them and the obtained SUS scores. The two versions of the prototypes have been differentiated in the analysis of the obtained results as well.

4.2.1 Level of Completion

According to the level of completion of the tasks (T#), the results show that technical users have significantly less difficulty while using the platform than non-technical users. As shown in Table 1, the average score of technical users is near 75 points, while the score for non-technical users does not reach 65 points in any of the versions of the platform.

Apart from that, it is meaningful that the improvements of the second version of the platform had a positive impact in the scores of the users. For instance,

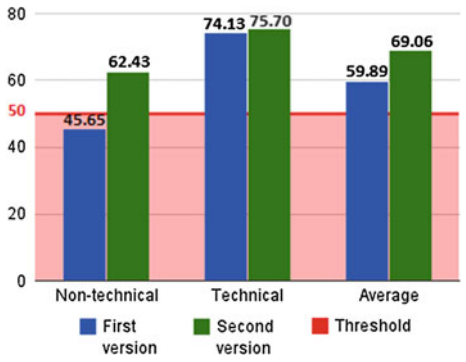

Fig. 4 Overall level of completion of the tasks

non-technical users augmented their average score in more than 16 points and all of the participants successfully completed their tasks.

It is also relevant that there is a difference of 15 points for the first task in the case of non-technical users between the first and the second version. This is meaningful since the first task is where participants use the tool for the first time and they learn the basic functionalities of the platform. Not only has the score of the first task been improved, but also the rest of the tasks have a higher score in the second version of the platform.

Task number four evidences that the improvements of the second version have contributed to provide users with a more useful platform. For instance, in the first version of the platform, non-technical users did not reach the minimum score, while in the second version they completed the tasks smugly, with more than 19 points of difference in comparison with the previous version. This is the highest score improvement between the two versions of the platform.

The positive impact of the improvements of the second version can be better differentiated in Fig. 4, where the average scores for all the tasks are shown. For instance, the figure clearly shows that in the first version, non-technical users did not reach the minimum score, while in the second version they successfully completed the tasks. It is also significant that technical users did not improve the scores as much as non-technical participants. The reason for this could be that they can be easily adapted to the platform functionalities regardless of its level of usability, thanks to their technical skills.

Also, it is meaningful that the overall score of non-technical participants in the second version of the platform is more than 12 points above the established threshold. This means that they can also design high quality mobile web contents with the tool.

4.2.2 Time

Regarding the time spent in the completion of the tasks shown in Table 2, the difference between the two versions of the platform is especially significant. With

Table 2 Average time spent by the users in the completion of the tasks

	Non-technical		Technical	
	v1	v2	v1	v2
T1	20′28″	13′57″	20′26″	9′40″
T2	6′06″	7′41″	8′05″	7′13″
T3	6′06″	6′34″	6′22″	5′52″
T4	7′59″	7′37″	8′13″	7′15″
Total	40′40″	35′51″	43′07″	32′31″

the improvements of the second version, non-technical users spent an average of 6′31″, which is about 32 % less time, and technical users spent an average of 10′46″, which is about 52 % less time, to complete the tasks.

There is an odd result that can be observed regarding the first version of the platform. Here, technical users spent 2′27″ more than non-technical users. Two are the main reasons for this. The first one is that technical users explored all the functionalities of the platform in order to design better web pages. The second one is that non-technical users did not understand some of the functionalities of this first version of the platform and they finished their tasks with a lower completion scores (see Table 1). In the second version of the platform, all the participants spent less time to complete their tasks and they improved their scores as well.

It is also relevant that the time spent for the completion of the first task is higher than the time spent for the rest of the tasks. This evidences that the users get more confident with the platform as they use it.

4.2.3 SUS Questionnaires

After the evaluation, all the participants had to fill out a SUS questionnaire in order to get the usability scores for the platform. This scale establishes that the scores that are over 68 points state that the platform is usable.

The original SUS questionnaire has ten statements that have to be evaluated using a likert scale between 1 and 5. For the scope of this research, the likert scale was designed from 1 to 10, in order to avoid neutral answers. The results were then normalized according to the original SUS scale in order to calculate the final score.

As seen in Fig. 5, the improvements of the second version of the platform have contributed to achieve better results. Technical users obtained a satisfactory score in both versions, which is nearly 10 points above the threshold established by the SUS scale. This is because of their experience using these kinds of web platforms and their technical knowledge in general.

On the other hand, the improvements of the second version also contributed to get better scores by the non-technical participants. The first version was rated with an average of 55.5 points by non-technical users, 12.5 points below the threshold, while the second version was rated with 73 points. This way, the platform is usable for both, technical and non-technical users.

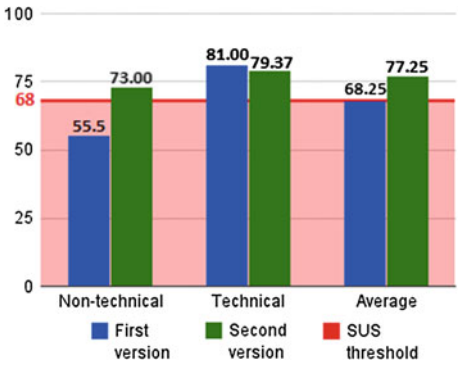

Fig. 5 SUS scores

The overall score of the non-technical users is about 6 points below the score of the technical participants in the second version of the platform. This evidences that they consider that the tool is usable in a similar way to technical users.

5 Conclusions and Implications

This paper presents a platform in order to create mobile web pages designed for people with no programming skills. The users of the platform can obtain a QR code to ease the access to the created web pages as well. The tool has been tested with 20 people. The evaluation tests were carried out in two stages. In the first stage, 5 technical users and 5 non-technical users carried out the evaluation. With the results of the first stage, some improvements were implemented in the platform. The second version of the tool was tested again with other 10 participants.

This section summarizes the obtained conclusions based on the analysed results, giving some guidelines to be considered when developing software systems oriented to non-technical people. Also, the future work is described.

5.1 Design Guidelines

Based on the analysis of the evaluation results and the observed behaviours of the participants, some basic guidelines are presented for future developments of these kinds of systems.

- Users act impulsively. They do not usually read the texts that appear in the user interface (e.g. labels, info messages, error alerts and help dialogs), so they usually make unexpected mistakes. This way, it is convenient to use visual resources like icons and colours instead of long texts. They should be as self-descriptive as possible.

- Avoid technical terminology. Not all the users have the same knowledge about technology, so it is recommended to use a clear and easy language. Specific domain terms should be avoided.
- Users are unpredictable. They use the tool in many different ways. This way, the functionalities have to be implemented in order to easily guide users in their tasks. For instance, it is not recommended to have more than one way of doing the same action because they get confused.
- Give examples when specific information of the user is required. For instance, there are several ways of requiring a twitter account, by URL, by username and by "@username". This way, the system has to provide an example of the required parameter.
- Usability improvements increase the effectiveness of non-technical people. As it has been observed, the second version of the platform increased the completion and usability scores of the non-technical users, while the scores of the technical users where almost the same. This way, if the tool is designed with non-programmers in mind, the usability of the system has to be well analysed and tested.

In this particular research work, some technological gaps were found in non-technical users. For instance, not all of them had Internet skills like getting images, social media sites, audio files or video links from the Internet. This was an important skill to complete the tasks successfully. Furthermore, not all of the participants realized that the tool provided them with a web gesture like drag and drop.

Finally, the most important lesson that has been learned from this research work is that the final users of the system have to be involved since early stages of the development process.

5.2 Future Work

As the results of the user evaluation have evidenced, the second version of the platform is more friendly and easy-to-use for the users. However, there are still some improvements that can be implemented in order to increase the obtained scores. For instance, contextual tips can enhance the usability of the tool, as well as the option to upload multimedia resources (e.g. images, audio files and videos) from the computer of the user instead of having to find the link of the resource from the Internet.

As mentioned before, this platform is also able to get the location of users that scan the generated QR codes with their consent. This way, it is planned to analyse and visualize these data in order to understand visitor mobility patterns.

Finally, as mentioned in the guidelines, the involvement of the final user in the development process is quite important. There are some development methodologies that are going to be used in future developments, like the ones related to User Centred Design (Bødker et al. 2007).

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Constructing a Data Warehouse Based Decision Support Platform for China Tourism Industry

Xiangjie Qiao, Lingyun Zhang, Nao Li and Wei Zhu

Abstract Rapid development of China's tourism industry has brought new challenges to tourism public management and service systems. How to adapt to highly complex tourism market changes, to formulate reasonable development strategies, to meet the demand of independent, flexible, personalized tourism service requirements, and to acquire long-term sustainable development and maintenance of the tourism industry have become major issues for developing the current tourism industry in China. The big data based concept has provided research ideas and solutions for the innovation of tourism public management and service systems. A decision-making support and data analysis platform based on data warehousing is put forward in this paper; business intelligence is introduced into the platform as well. The framework of the platform, some key steps of implementation, and application cases are discussed in the paper. Through our research, it is expected to provide a resource for other countries who are trying to build a similar data warehouse application for their tourism industry.

Keywords Data warehouse · Business intelligence · Data mining · Big data · Tourism decision support platform

1 Background

With the rapid development of Information & Communication Technology (ICT) application in every aspects of our whole society, how to better manage and utilize large amounts of data in highly efficient ways has become a major challenge for academia, industry and government agencies (Bryant et al. 2008). However,

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Research and application of the big data concept is still in its infancy (Nature 2008; Science 2011). The in-depth studies on changes and impacts of big data from the view of management and intelligent decision-making are very limited (Feng et al. 2013). The application of big data in the tourism industry, particularly by tourism enterprises, is even more limited and very rare in industrial development policy making by government (Mayer and Kenneth 2013; McDonald 2013).

A destination can use big data to predict the contribution and impact of visitors to the local economy, culture, and environment (Law et al. 2007). Governmental bodies can project public revenues from tourism and ensure that appropriate capacity and infrastructure can be maintained. Therefore, we put forward a framework for tourism public management and service systems based on big data. By collecting different kinds of data from various sources like government's management data, tourist-based data and industry data to form a tourism data centre, applications like a tourism safety emergency command, tourism demand forecasting, tourism resources carrying capacity monitoring, tourism environment monitoring and pubic information services can be implemented based on data analysis technologies such as machine learning, data mining or mathematical statistics.

Business Intelligent is a set of theories, methodologies, processes, architectures, and technologies that transforms raw data into meaningful and useful information for business purposes. It can be understood as a general application of data warehousing, On-Line Analytical Processing (OLAP) and data mining technology. Due to the deficiency of handling integrated, historical and aggregated data, the On-line Transaction Processing (OLTP) System cannot meet decision making needs. Data warehouse is a copy of transactional data that facilitates decision support. It is subject-oriented, non-volatile, integrated, time-variant and oriented towards users who are decision-makers (Inmon 1996). A data warehouse based decision support system in tourism improves decision making with timely, accurate and complete information (Kirkgöze and Tjoa 1998). So this mode of data organization provides a good means to analyze, evaluate or predict development of the tourism market and economy. A data warehouse based tourism decision support platform is constructed and discussed in this paper. Section 2 presents related research on data warehousing and data mining that is used in the tourism industry. The platform's technical architecture, implementation steps, and selected applications will be discussed in Sect. 3. Section 3 concludes the paper and offers thoughts for future work.

2 Related Research

There is little research literature or related works on data warehousing for the tourism industry. Although huge amounts of data are available at tourism destinations, these valuable knowledge sources typically remain unused (Danubianu et al. 2009; Hendawi and El-Shishiny 2008). However, there exists high demand in

electronic publishing of market research results in the tourism industry, which has been proved by tracking and analyzing 256 tourism managers using the log of an online database called TourMIS for a period of 12 months (Wöber 1998). Some literature has discussed concepts and the value of data warehouse use in the tourism industry. Danubianu et al. (2009) presents the need for a data warehouse in the Romanian tourism industry which would provide an analytical tool for decision makers in the tourism industry to make decisions more effective and timely. Kirkgöze and Tjoa (1998) offers cases on how data warehousing and data mining can be applied in the tourism industry. A web-based data warehouse and DSS architecture are also discussed. Other literature introduced a data warehouse prototype and implementation for the tourism industry. Hendawi and El-Shishiny (2008) present a data warehouse prototype from Egypt using data sources from the Egyptian Ministry of Tourism. Höpken et al. (2013) apply methods of BI and data warehousing into a destination management information system (DMIS). Indicators for decision support involve economic performance, customer behaviour and customer perception and experience. Australia's National Tourism Data Warehouse (NTDW) is mainly used for destination marketing. Its objective is to provide consistent and reliable products and destination information for trade partners and consumers at home and abroad (Daniele et al. 2000). This is significant for a destination's marketing to build a public platform such as this because it can save IT resources and manage information in a unified, standard way. By reviewing the literature on data warehousing applied in the tourism industry, we find that it is still not popular to develop decision support systems for government or industry managers. Maybe more requirements analysis or successful applications need to be developed to demonstrate its efficiency in the tourism industry before it will be generally accepted by managers.

Data mining's application in the tourism industry can be grouped into the following five categories: automatic predicting trends or behaviours (Zhang and Zhang 2012), association analysis (Zhou et al. 2008), clustering, concept description (Tichter et al. 1999) and deviation detection. A typical example for automatic predicting is the tourism demand analysis. Based on a literature review, the methods for predicting may can be classified into two. One is traditional methods, such as delphi, time series (Burger et al. 2001), and econometric methods (Akis 1998). The other refers to modern methods which usually adopt artificial intelligence technologies like artificial neural network (Law et al. 1999), rough set (Goh and Law 2003), fuzzy time series (Wang 2004), grey theory and support vector machine (Chen and Wang 2007). It indicates that neural networks often outperform others. Law et al. (2007) has found that compared to the traditional econometric or statistical modelling techniques, data mining is still at its infancy. However, summarizing the literature on forecasting tourism demand, they mainly focus on forecasting methods while other issues like how to apply these methods to the real world or how to help tourism destinations improve their service quality and capacity are rarely involved. These are very important for a destination and also should be the aim for research of demand forecasting. Other methods are more widely used for tourism marketing (Zeng and Xiong 2002), such as market

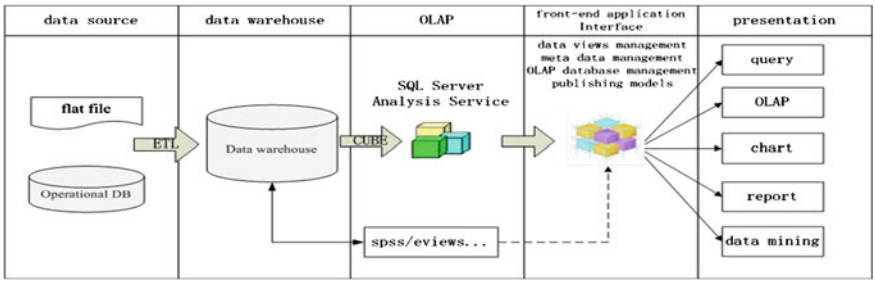

Fig. 1 Technical architecture

segment (Dolnicar 2002), cross selling, and Customer Relationship Management (CRM). Over the past few decades, rapid development of the Web has made it the biggest data source. The aim of web mining is to find interesting patterns from hyperlinks, web content and web logs (Wöber 2007; Pitman et al. 2010). Its application may include building a personalized web site, clustering customers, improving customer loyalty, and destination or products recommendations (Saraee et al. 2005; Zanker et al. 2008).

3 Data Warehouse Based Decision Support Platform for Tourism Industry

3.1 Technical Architecture

The platform's technical architecture is shown in Fig. 1. The data may variously come from flat files or any other database systems. The system will establish a data source connection through Open Database Connectivity (ODBC), Object Linking and Embedding Database (OLEDB) and drivers for specific databases. After data is cleaned, converted and loaded by ETL tools, all integrated data will be imported into a data warehouse. Based on Microsoft SQL Server Analysis Service, we developed a front-end application interface to deal with data views management, metadata management, OLAP database management, model publishing and presentation with a visual user interface. Through this application interface, a developer can easily build a data warehouse and multi-dimensional data model for analysis and publish them as reports or charts. Moreover, we can develop the Application Program Interface (API) to connect our platform with analytical software programs like SPSS or Eviews to make a more professional analysis then present the results in a web explorer.

3.2 Data Source

The data source is the foundation and root of the platform. To assure that data is authoritative, reliable and accessible, we primarily select data issued by authorities and social media. The indicators used in our platform and their access channel are listed in Table 1.

3.3 Implementation Steps

Requirements Analysis and Subject Identified. Because a data warehouse is subject-oriented, before building it we should take an overview of all the data and indicators to determine the correlations among them to identify the subjects. Once the subject is constructed, the OLAP model will be built based on it. So the requirement analysis is significant in the whole process of modelling. However, we find that the original data are not always arranged together, even though these data describe the same subject. So we need to take time to study the data. For example, in the inbound tourism data provided by UNWTO, we find that there are four spreadsheets describing the arrivals for accommodation: (1) Arrivals of non-resident tourists in hotels and similar establishments, by country of residence; (2) Arrivals of non-resident tourists in all types of accommodation establishments, by country of residence; (3) Overnight stays of non-resident tourists in hotels and similar establishments, by country of residence; (4) Overnight stays of non-resident tourists in all types of accommodation establishments, by country of residence. Moreover, by summing every region's data we find that they are equal with the yearly summary data which is stored in another sheet. So we can confirm that these four spreadsheets are all about the arrivals for accommodation, only in different views. Therefore, we combine these spreadsheets to form a subject. Thus, when users view these data, they can discover the correlation among them and the data will be more meaningful.

Data Preparation. Much of our data comes from yearbooks, such as The Yearbook of China Tourism Statistics published by China's national tourism administration, and electronic data stored as Excel datasheets, such as Compendium of Tourism Statistics, Yearbook of Tourism Statistics published by UNWTO. So before importing the data into the data warehouse, we should code each country and dimension first and fill in the corresponding data value according to its code.

Design data warehouse. This step includes the logical structure design and physical structure design. The main task for logical structure design is to model the fact and dimension table. The data in the warehouse are organized by multiple dimensions and put into a structure of dimensional modelling. The fact table contains important numerical measures to the user, as well as the keys to the

Table 1 Data and indicators

Primary indicators	Secondary indicators	Third level indicators	Data source
Market	Inbound tourism market	Inbound tourist arrivals, inbound tourism receipts	National tourism administration
	Outbound tourism market	Outbound visitors number, outbound tourist expenditure	National tourism administration
	Domestic tourism market	Domestic visitors number, domestic tourism income	National tourism administration
	International tourism market	International tourist arrivals, International tourism receipts, international tourism industries, employment, macroeconomic indicators related to international tourism	UNWTO, tourism official web site of the country
Industry	Employment	Employees	Enterprise direct reporting systems
	Tourism investment	The government investment scale, enterprise investment scale	National tourism administration, enterprise direct reporting systems
	Accommodation for visitors in hotels and similar establishments	Star-rated hotels, number of rooms, number of beds, reservations, average room price, room occupancy, total revenue, operating costs, employees, fixed assets investment	Enterprise direct reporting systems
	Travel agencies	Reservations, receptions, total revenue, operating costs, employees, fixed assets investment	Enterprise direct reporting systems
	Tourist attractions	Reservations, ticket price, receptions, total revenue, operating costs, employees, fixed assets investment	Enterprise direct reporting systems
	Listed companies	Reservations, total revenue, operating costs, employees, fixed assets investment	Listed companies' quarterly report
Economy		GDP, exchange rate, per capita disposable income, international economic indicators	National bureau of statistics, the world bank, IMF, the people's bank of china, OECD, UNCTAD

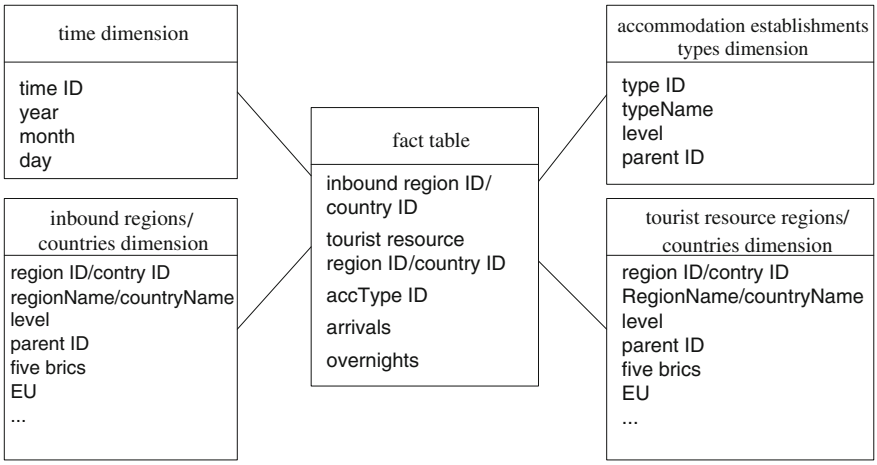

Fig. 2 The logic structure of arrivals for accommodation

dimension tables, which in turn include numerical and descriptive attributes (Gray 2006; Jukic 2006). Two well-known types of dimensional models are the star schema and snowflake schema (Gray and Watson 1998). So the logical structure for the example mentioned in 3.3.1 can be designed as Fig. 2 by using star schema. We define the accommodation type as a dimension, its members will be hotels and similar establishments and all types of accommodation establishments. The number of arrivals and overnight stays can be the measures stored in the fact table. We also have the time dimension and regions/countries dimension. Here the regions/countries dimension has two kinds. One refers to the inbound regions/countries and the other stands for tourist resource regions/countries. The dimension level of regions/countries is designed in accordance with UNWTO.

ETL. Using the Data Transform Service (DTS) provided by Microsoft SQL Server, we completed the data extraction, transformation and load (ETL). DTS tasks have two kinds: data flow task and SQL task. Data flow tasks are mainly used to extract data from a source to the destination database. SQL tasks are used to clean and transform data. In general, a DTS task may include deleting existing destination tables, extracting data from its source and cleaning the data.

Metadata's Definition and Management. Metadata refers to "data about data". It makes the analysis process easier to manage. It describes all objects in a data warehouse. Through metadata's management, we can build a data dictionary and implement its upload/download from a remote Web application Server. Also, some business rules can be defined through metadata, such as incremental update frequency for ETL, whether used to conduct an OLAP analysis or to create an intermediate table. All these can be easily set by the front-end application interface.

OLAP Modeling. OLAP modelling can also be understood as creating cubes for the multi-dimensional data set. The model can be designed after answering

three questions: (1) What needs to be analyzed? (2) What dimensions are needed in this model? (3) Where will these required data be stored and what is the relationship among the related tables?

Then an OLAP database can be built through the following steps: (1) Build data views according to the subject; (2) Create dimensions; (3) Create the multi-dimensional data set; (4) Define the measure values and computing members like the accumulative total, year-on-year comparisons; (5) Design the presentation of management cockpit and multi-dimensional reports.

Publish Models. The multi-dimensional data model previously built should be published to the web server (we used IIS as the web server) so that users can browse it through their web explorer.

3.4 Application Cases

Due to the characteristics of simple, flexible and easy to use, the platform can be useful to policy makers, researchers, planners, or industry practitioners. More importantly, the platform can provide accurate and comprehensive information on tourism markets, industry, and economy. Data can be transformed into useful information for different kinds of users with various analysis needs. Firstly, for decision-makers or policy-makers, the platform can offer an overview of the tourism environment so they can quickly grasp the market's development status and trends. For example, they can easily identify the top ten countries for international arrivals, receipts or expenditures. They can determine China's rank in the world, in East Asia or the Pacific region. A comparison of two countries or regions, even associations or organizations, can be easily generated. To facilitate comparison and queries, we have designed a view mode so that associations or organizations can be viewed like a dimension. We defined these organizations as dimension attributes which include the Association of Southeast Asian Nations (ASEAN), five BRICS, European Union (EU), Schengen, G77, G20, East African Community (EAC), Pacific Community (PC), and Shanghai Cooperation Organization (see Fig. 3). Users can choose any organizations from the attribute list and add them into the row or column area to analyse. All these operations can be available through a simple mouse click or dragging them onto multi-dimensional reports. Also, users can use the management cockpit to capture some key indicators and trends in a few minutes. And the most valuable function for users is to analyse the correlation between data by using the drill operations to mine the in-depth causes for the data. The chart below shows the breakdown of international tourism receipts. When clicking on a pie slice (a region) in the pie chart, the right chart will show the top ten of this region (see Fig. 4). Also, users can drill the chart to discover more details. For example, you can double click on the column in Fig. 4, then a path list related to this subject will appear. Then you can select one path and you will see a report with more details about the subject. Various kinds of

Fig. 3 Multi-dimensional report viewed by five brics

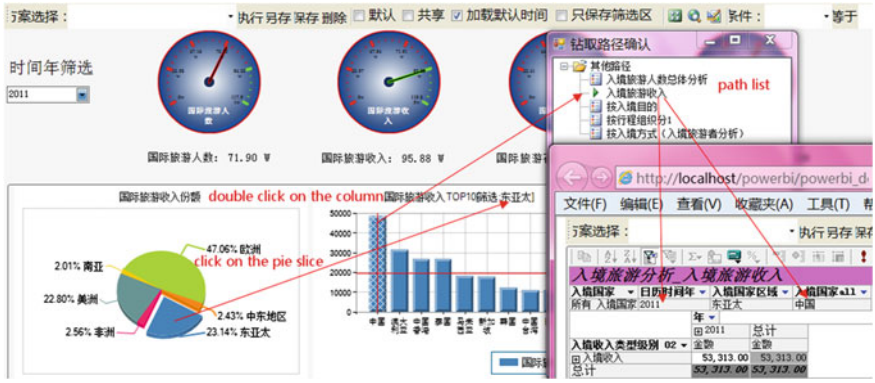

Fig. 4 Correlations and drill path analysis in management cockpit

charts can be found in the management cockpit, such as a dashboard, pie charts, line charts, column charts, and digital maps.

Although data collection is essential, it is not enough to maximize its value. We should adopt more data analysis methods to make full use of these data. On the one hand, we will carry out development of data for service or industry applications, such as a tourism early warning and monitoring system and index models like an industry climate index model, a tourism competitiveness model, and a tourism purchasing power model.

We also hope to collect more external data into the data warehouse. We'd like to collect more customer-based data from e-business enterprises about online tourists' behaviours. The companies may include tourism online agencies like Ctrip and eLong, tourism search sites like Qunar.com and Kuxun.cn, social travel sites like mafengwo.com and daodao.com. Indeed, the analysis will depend on the data we can reach. Issues on heterogeneous data source, semi-structured data and unstructured data should definitely be further explored as well.

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Destination Inspiration Using eTourism Tool

Martin Goossen, Henk Meeuwsen, Jappe Franke and Arjen de Jong Alterra

Abstract In rural areas tourism is often seen as an opportunity for economic development. Policymakers are searching for instruments to measure values of regions for tourism development. As landscape can be an important unique selling point in rural areas, understanding land use preferences of tourists is essential to describe the value of rural areas. For the tourism industry it is important to know if there are similarities among the tourists in terms of landscape preferences to invest in or promote certain regions. The goal of this project is to collect data of landscape preferences for policymakers and the tourism industry. Information was gathered using geographical data in a Destination Discovering System within www.myplacetobe.eu website, where visitors can discover their favourite holiday destinations in Europe according to their preferences. About 7,000 personalized maps are made by more than 3,300 unique visitors. Forest is the most preferred landscape type.

Keywords Destination recommendation system · Maps · Tourism · Land use preferences · GIS

1 Introduction

Many policymakers recognize that tourism is a sector that provides significant potential for economic growth and development. It is believed that tourism consumption has a positive effect on the regional economy and employment and can play a role in maintaining regional identity. In a regional planning process, especially for rural areas, stimulating tourism development can be a challenge.

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Many European rural areas suffer from a decline in regional income, loss of inhabitants and degradation of the natural and agricultural values. Environment and landscape are important attractions for tourists, especially those interested in nature-based tourism. Tourists' expectations of the environment are to a certain extent different: some tourists look for cultural landscapes and a traditional, countryside living, whereas others hope to be able to find nature in a pure and original condition (ETC 2006). Thus, it is important to consider tourists' preferences towards landscape in the regional planning process. The goal of this project is to collect data of landscape preferences for policymakers and the tourism industry.

The use of knowledge from consumers is getting more important in the regional planning process. Until today, in the interaction between professional actors in the planning process, there is a severe lack of information regarding subjective choices, preferences and consumer attitudes when it comes to landscape assessment. Knowledge about the importance of natural values is often derived from ecologists and landscape values are often measured by experts, and not by consumers. Tourism and recreational values offered by ecosystems have been recognized as one of the main cultural services that nature provides to humankind (Marton-Lefevre and Borges 2011). A recent study (Bidoglio and Braat 2012) trying to map these cultural recreational services shows the difficulty of measuring the benefits. What is missing is a systematic and robust knowledge about which ecosystem tourists prefer. This is rather essential in a policy to stimulate tourism development. In tourism the natural environment is a main factor to determine a region's attractiveness as a holiday destination (TNS Political and Social 2012; Breman et al. 2009; Viner and Agnew 1999; Lohmann and Kaim 1999). Of all economic sectors, the tourism industry is the only one that offers natural surroundings as a key component of its product (Mieczokowski 1995). From a research among 64.000 people who answered the "question of the day" on the website of the Dutch commercial bank ING (2010), it is identified that Dutch consumers decide first the destination (45 %) for a holiday, followed by budget (32 %). According to Eurobarometer (1998), scenery (49 %) and climate (45 %) are the two determining factors when a destination is selected. The cost of travel (35 %) and the cost of accommodation (33 %) come next. TNS Political and Social (2012) reported in the European barometer that nature was not the most important factor, but 18 % considered it important.

Institute Alterra, part of Wageningen University and Research centre in The Netherlands, started a project called electronic Information System for landSCAPE preferences (e-SCAPE). Central to the project is the question of how to create a useful European information system on landscape preferences, which gives tourists destination recommendations to get inspired from and gives policymakers and the tourism industry data about landscape preferences and preferred destinations. e-SCAPE system maintains a database of, among others, individual preferences of landscape using a website, www.myplacetobe.eu, which focuses on European destinations, to fill the database. e-SCAPE system is designed to move from a pure expert-based assessment to a true bottom-up preference assessment as a real

participatory approach. e-SCAPE system delivers knowledge about consumer preferences that can be used in the regional planning process, impact assessments and tourism promotion of certain destinations. e-SCAPE system completely depends on the Internet to be successful.

2 The Tourist and Internet

The Internet is a central channel for communications and transactions in the tourism industry today. The European Union found websites and Internet usage to be far more widespread in the tourism sector than in the economy as a whole (Bovagnet 2005). In the travel accommodations sector, 82 % of enterprises had a website or homepage, and 93 % were connected to the Internet. Tourists use the Internet at the pre-sale stage (to provide and obtain information), for online bookings (e.g., of hotel rooms), to be connected with friends and for information on the spot using location based services. In the EU27, 72 % of households have access to broadband at home in 2012, an increase of 11 percentage points compared with 2010 (Eurostat 2012).

The ability to access information is fundamentally changing the tourism industry in terms of how people use information sources. People are shifting to the Internet as their first place to search, supplanting word of mouth as their initial means of gathering information. The Eurobarometer shows that, in terms of organising their 2011 holiday, a majority (53 %) of respondents said that they made their arrangements via the internet (TNS Political and Social 2012). Research by the Netherlands Board of Tourism and Conventions (NBTC 2006) shows that 69 % of foreign tourists use the Internet in making their decision to travel to the Netherlands together with offline information sources. A similar relationship between the Internet and other sources was found in a study by Lee et al. (2007).

Tourists have no complete knowledge on where their favourite natural environments could be found. People mostly ask friends and relatives (TNS Political and Social 2012), but the information they obtain in this way may not always be relevant. They might read an article in a magazine or newspaper, notice a campaign from a local or national tourist board, or see a (sponsored) program on television, but they seldom know whether this information is objective. That is one of the reasons review websites such as Tripadvisor or Zoover are very popular. Tourists filter these subjective reviews for elements they find important. As reviews are used as indicators of quality, decisions are sometimes made upon these reviews.

The potential of the Internet to create more interactive and vivid search experiences has not yet been fully exploited by tourism marketing websites (Hwang et al. 2006). Consumers spend on average seven to 10 h on the internet to find their holiday destination; 16 % spend even more than 20 h (Telegraaf 2010). According to 66 % of the Dutch population, it takes too much time finding the

right holiday on internet (Multiscope 2010). Further, according to a research from Skyscanner (2012) amongst 20,000 international tourists, choosing a destination is the most stressful element in the preparation of a holiday.

3 Destination Discovering System

The beta-version of www.myplacetobe.eu was launched at the Holiday Fair in the Netherlands in 2013. The innovative approach in research methods applied in this project can be encapsulated as 'give first, then ask and save'. That is, this website gives Internet users the opportunity to compile their own landscape preferences, choose their own climate preferences, the types of holiday, and holiday seasons. Using Geographical Information System (GIS) data, the users' preferences are then compared with the actual supply. That comparison leads to a unique personalized map showing where a person's own preferred landscapes for a holiday or a daytrip are located in Europe: 'my place to be'. In the meantime, all preferences entered by the user are saved in the database.

The website can be useful in the orientation phase of a travel plan for a tourist. This strategy has a strong relation with Destination Recommendation Systems (DRS). Recommendation systems are defined as software tools that make recommendations based on learned information about the user's preference function (Häubl and Trifts 2000). Several DRS are operational in major tourism portals (Venturini and Ricci 2006). They acquire the user preferences in order to suggest interesting travel products, hence allowing the users to book their preferred products (Mahmood et al. 2009). This website is not focused on selling products and there are more differences between this website and other DRS. Several DRS's start with the question to which country or which region a tourist wants to go (e.g., *Tripadvisor*, *Visiteurope.com*, *Austria.info*). In the orientation phase, not every tourist has a clear idea which country is interesting. Another difference is that several DRS using semantic strategies (Happytellus.com) or photographs (pixmeaway.com). The information in a semantic destination recommendation system mostly comes from the tourism industry themself. A website visitor is often unsure if the information is trustworthy. Using photographs as inspiration is promising, but not every destination has appealing photographs. Using GIS data has the advantage above semantic destination recommendation systems, that the outcome is more trustworthy. Off course the GIS-data has to be up to date and complete. Not every tourist will be interested in using the website. It is not likely that those tourists who spend their holiday every year on the same spot will use the website. Also, tourists who are more interested in see, sun and sex will probably not use the website, because they are less interested in landscape. Only tourists with an interest in a more active holiday in which nature and landscape are important could use the website. Especially when they do not know where to go, this website could be inspiring and discover destinations they never heard from. Hence, the system is referred to as a Destination Discovering System.

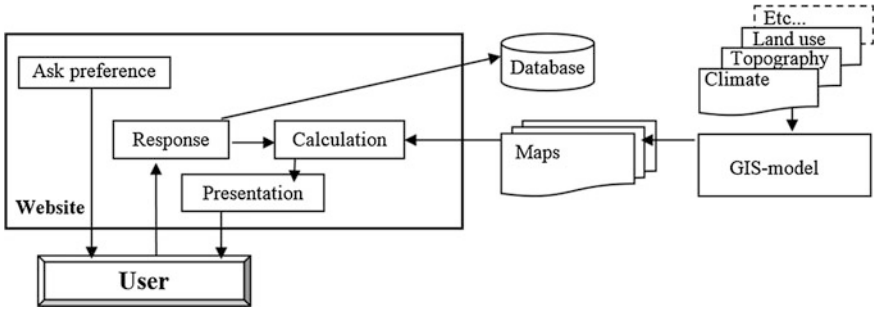

Fig. 1 Schematic presentation of the project

Several findings from the literature influenced the construction of the website. One is that website visitors consider both the outcome of the technology and the process by which the technology operates (Davis et al. 1989). The outcome aspect is captured in 'usefulness' dimension, that is, the user's preferred destinations are shown. The process by which the technology operates tends to be evaluated in two dimensions: ease of use (or lack of effort) and enjoyment (or fun to use) involved in working with the technology (Dabholkar 1996). A website has to be well-ordered, easy to use, succinct in the amount of text to read and intelligible. Internet users do not want to wait, so the outcome or results have to be delivered quickly. To have a successful tool (that means a lot of visitors to get a lot of data) the Technology Acceptance Model (TAM) approach of Davis et al. (1989) together with the Hedonic Information System of Van der Heijden (2004) are used.

4 The technique of e-SCAPE

Figure 1 shows a schematic presentation of the project. The technique is built upon the prior Dutch version www.daarmoetikzijn.nl (Goossen et al. 2009). The database and GIS-model work outside of the website. A GIS is defined as an information system used to input, store, retrieve, manipulate, analyse and output geographically referenced data or geo-spatial data, in order to support decision-making for planning and management of land use, natural resources, environment, transportation, urban facilities and other administrative records.

The building blocks of the GIS model exist in separate spatial databases. Website visitors choose among several features. The website takes the visitors through three easy-to-use steps. Step 1 invites visitors to choose their holiday period and matching climate preferences, and to imagine a landscape that they find attractive, and then to choose what features that the landscape in their potential destination would have, and in what proportions. Step 2 enables the website visitor to choose landscape features in the surroundings of their potential destination and in which proportion of distance (e.g., for daytrips). Finally, for research purposes,

Step 3 solicits information about visitors' gender, age, country, postal code, preferred recreational activities and the attractiveness of the landscape in the visitor's home environment. According to the users' preferences, a map of Europe, unique for each visitor, is then drawn. It takes about 0.75 s to generate a map. This personalized map shows areas where the visitor will find their ideal landscape and also those areas they should rather avoid. It also gives their top five destinations in Europe. Sometimes the map produces exciting and novel choices that are beyond visitors' expectations. This is in line with the hedonic aspects of a recommendation system. The website assists tourists in their decision-making not only by reducing their search efforts but also by improving the quality of their decisions because the recommended destinations fits with their preferences.

Visitors can also zoom in on the map, with overlays Google Maps. With Google Maps there is the possibility to book accommodation in the preferred region and see pictures and videos of their desired destinations. It is possible to look around in 3D with street view. With the use of a routeplanner, the visitor can drive directly to the desired destination. The visitor can send their personalized map also to others with Twitter and Facebook.

Two elements are key in this application: (a) the features and (b) the existence of geographical data on these features. Not all of the main features in organising a holiday, like the security of the destination and price level of the destination are reflected in geographical data. Because there are no geographical database in Europe or incomplete geographical database (for some countries) of these features.

Several geographical data has been used. Most of the data are coming from the land use layer of the European Landscape Classification LANMAP (Mucher et al. 2010). In LANMAP data from CORINE land cover from the European Environmental Agency are combined with PELCOM from Alterra (http://www.geo-informatie.nl/projects/pelcom/) and GLC2000 (http://bioval.jrc.ec.europa.eu/products/glc2000/glc2000.php) from the European Joint Research Centre (JRC). LANMAP is a landscape classification of Pan-Europe with four hierarchical levels; using digital data on climate, altitude, parent material and land use as determinant factors; and has 350 landscape types at the most detailed level. Other data are coming from climate institutes. Also open source data from Open Street Map are used. The data had to be edited to achieve a consistent format. The geographical data was reclassified to a single resolution of 5 by 5 km. This encompasses an area of some 25 km^2, large enough for a walk or cycle tour. For every grid cell a value for the features is known.

The next step was to compute the score of each feature (in percentages) in the area of 25 km^2. A spatial database was constructed per feature for every five percentage points (including 0 %) of the score of an area. This leads in theory to a maximum of 21 separate spatial databases for every feature.

Table 1 Number of visitors per country

Country	N	%
Netherlands	2,169	65.5
France	102	3.1
Canada	97	2.9
Belgium	92	2.8
United Kingdom	91	2.7
Germany	88	2.7
Italy	48	1.4
Spain	44	1.3
Switzerland	41	1.2
United States	41	1.2
Other countries	500	15.2
Total	3,313	100

5 First Results

The first results are promising considering no real promotion was made yet. In addition to the website launch at the annual Holiday Fair in the Netherlands in 2013, presentations were made tourism conferences and a call for participation was posted on TRInet and ATLAS. These resulted in 31,944 visitors to the website. From those, 3,313 unique visitors (10 %) really did make personalized maps. About 57 % of the visitors are male. The average age of the visitors is 41 years. About 6,800 personalized maps are made, which make up an average of two maps per visitor. This could mean that they are not satisfied with the results or they want to "play" with the system and discover which destination they get recommended if they change their preferences. Because the reason for this is not clear, for analysis purposes it is important to review what visitor first stated in terms of his or her preferences. It is believed that their first response represents the most reliable preference.

Most of the unique visitors are coming from the Netherlands (65.5 %), but also from France (3.1 %) and Canada (2.9 %) (See Table 1). Most visitors (46 %) did not fill in their relief preferences. For those who did, they prefer mountains (500–1,500 m) and hills (100–500 m) the most (respectively 20 % and 19 %). Not surprisingly is that July is the most popular holiday month (25 %), followed by August (16 %) and June (12 %). In line with the expectation is that the most preferred temperature is between 20° and 25 °C (68° to 77° F).

Most visitors prefer an active holiday (40 %) or they did not choose a specific holiday (31 %). Regarding the ten countries mentioned above, the visitors from The Netherlands (NL) and Italy (IT) prefer an active holiday more than average. Visitors from Spain (ES), United Kingdom (UK), United States (US) and Italy prefer a beach holiday more than average. A city trip is relatively more preferred by visitors from Spain, United Kingdom and Germany (DE). Visitors from Belgium (BE), Switzerland (CH) and France (FR) prefer a water sports holiday

Table 2 Types of holiday per country (%)

Type	Total	BE	CA	CH	DE	ES	FR	IT	NL	UK	US
Active	40.5	32.6	5.2	41.5	42.0	29.5	24.5	45.8	46.6	33.0	39.0
Beach	11.3	6.5	2.1	7.3	6.8	20.5	4.9	14.6	11.1	16.5	14.6
City trip	7.4	8.7	5.2	2.4	10.2	15.9	4.9	8.3	6.3	11.0	7.3
Other	6.6	8.7	0.0	4.9	3.4	2.3	3.9	2.1	7.9	6.6	12.2
Water sport	3.2	7.6	1.0	4.9	3.4	0.0	3.9	0.0	3.4	3.3	2.4
No specific	31.0	35.9	86.6	39.0	34.1	31.8	57.8	29.2	24.8	29.7	24.4
N	3,313	92	97	41	88	44	102	48	2,169	91	41

Table 3 The amount of visitors (%) with preference of type of land use

Land use	Yes	No	Indifferent
Forest	70.9	2.5	26.6
Villages	56.8	4.0	39.2
Fresh water	52.6	3.4	44.0
Natural grassland	46.5	4.7	48.8
Beaches, dunes and sands	40.6	4.7	54.7
Mixed arable land and pastures	39.6	5.6	54.8
Moors and Heathlands	32.7	5.4	61.9
Pastures	30.5	8.6	60.9
Plantation	28.2	7.2	64.6
Shrubs	23.0	5.4	71.6
Wetlands	20.8	6.6	72.6
Arable land	20.8	10.6	68.6
Glaciers and perpetual snow	20.3	7.6	72.1
Marshes	14.5	7.0	78.5
No vegetation	9.1	11.1	79.8
Industry	4.4	20.3	75.3

more than average. Visitors from Canada (CA) are less specific than average. Visitors who have chosen a beach holiday, city trip or water sports holiday cannot fill in their land use preferences at the destination part of the website. Because those destinations are already selected by the program (Table 2), they only can fill in their land use preferences at the surroundings of beaches, cities, and lakes. Other visitors can fill in their land use preferences for a destination. Table 3 gives an overview of the features visitors prefer. Forest is the most preferred land use type. 71 % of the visitors want some amount of forest in their holiday destination, followed by villages (57 %), fresh water (53 %) and natural grassland (47 %). Industry is less preferred (4 %) followed by no vegetation (9 %) and marshes (15 %).

Table 3 shows that most of the visitors are indifferent to choose a preferred land use type, especially for no vegetation and marshes and less for forest. The reason for this is that the slide by default stands on “indifferent”. The visitors have filled in an average of six features. A third (35 %) of the visitors filled in more than eight

Table 4 Amount of land use features filled in

Amount	N	%	Amount	N	%
0	253	9.8	5	271	10.5
1	67	2.6	6	259	10.0
2	138	5.3	7	263	10.2
3	199	7.7	8–12	696	26.9
4	237	9.2	13–16	204	7.8

Table 5 Average (%) amount of preferred land use*

Land use	Total	Land use	Total
Forest	23	Moors and Heathlands	11
Beaches, dunes and sands	17	Pastures	11
Fresh water	14	Arable land	9
Villages	14	Shrubs	9
Mixed arable land and pastures	14	Wetlands	8
Natural grassland	14	Marshes	6
Glaciers and perpetual snow	12	No vegetation	6
Plantation	12	Industry	2

*Computing the total exceeds the 100 %, because the land use types where filled in by a different number of visitors

land use types (Table 4). The chance of getting a complete red map (i.e., there are no recommendations) is bigger if the visitor fill in a lot of features.

Table 5 shows the amount of preferred land use at a holiday destination for those visitors who are not indifferent. This means that a preference of 0 % for a type of land use is also calculated. The destination is an area of approximately 5 by 5 km. In that area the average amount of forest which visitors prefer is 23 %. Almost a quarter of a holiday destination must be a forest, followed by beach, dunes and sand (as one type of land use) with 17 % and fresh water like a river or small lake (14 %). These results could change if more international visitors visit the website, because the total average preferences are now dominated by the Dutch.

Combining these results gives a map (Fig. 2) with the average preferences. The surroundings of the city Varna in Bulgaria has the most average preferred landscape, with a score of 7.22 out of 10. Number two with an average score of 7.17 is in France, a region between Lyon and Annecy.

An average landscape has something for everyone, but it can be easily stated that an average tourist does not exist. More research have to be done to compile market segments with the database. For example using their preferred activities during their holiday. e-SCAPE gives information about the activities. The ten most preferred recreational activities are listed in Table 6. Walking is the most popular activity during a holiday, followed by visiting natural sites and monuments.

Combining all these data from e-SCAPE gives tailor made recommendations, which could be interesting for the tourism industry. If a Destination Management

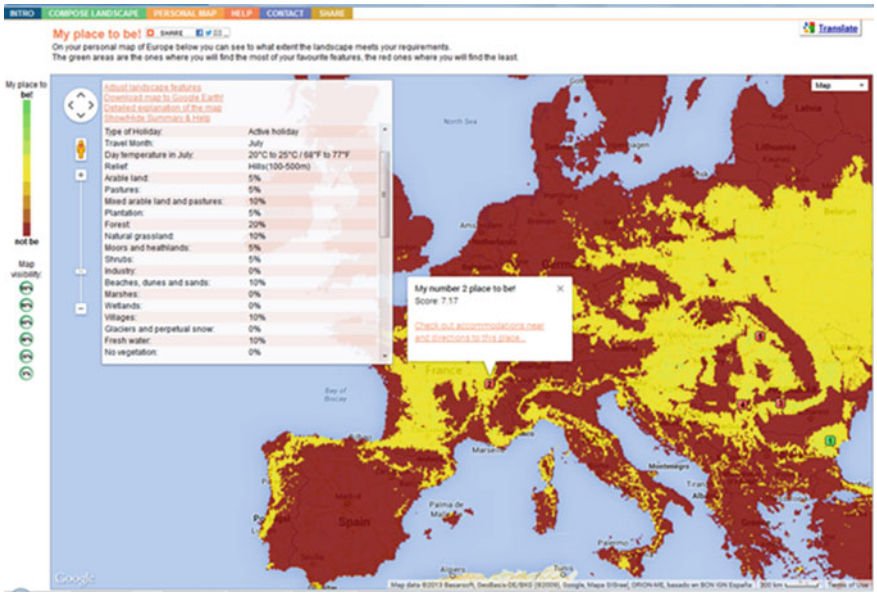

Fig. 2 "Places to be" based on average land use preferences

Table 6 Preferred (%) recreational activities during a holiday

Activity	Percentage
Hiking/walking	50.2
Visit natural sites	48.1
Visit monuments, castles, ruines	39.6
Swimming	39.5
Visit bars, pubs, café	38.3
Visit restaurants	36.3
Photographing	36.3
Visit cities	34.5
Biking	33.8
Relaxing, sunbathing, reading	33.6

Organization (DMO) wants to promote a region with a certain theme, the database of e-SCAPE could provide relevant data. About 15 % of the visitors have completed their email to participate in research. Of those, 66 % (10 % of the total) want to have more information about their preferred destination send by the tourism industry. This result could be interesting for Destination Management Organizations (DMO) for direct mailing strategies.

6 Evaluation

The website gives the opportunity for visitors to make comments. The comments will be used to evaluate the website. The first comments of the visitors are mostly positive, but some visitors are critical about the interface. For some visitors it is too scientific. The design is probably not interesting enough, because only 10 % of the total visitors are encouraged to make a map. It is also important to keep the data up to date. Land use is changing and new data about land use must be incorporated after a few years to remain trustfully. That makes the system vulnerable, because not every change in land use is directly assimilated in GIS on a European scale. More analysis is interesting, especially if there are differences between countries. More visitors are needed to make more national analysis.

The project is based upon a Dutch version called www.daarmoetikzijn.nl, which is the national component of myplacetobe.eu. In theory it is possible to make such an application for every (European) country using more detailed national GIS-data or to make an on-demand tool for the tourism industry, using their own data (e.g., hotel accommodation). The website gives the possibility for visitors to fill in their email if they want more information from the tourism industry and/or to participate in future research. A total of 625 Dutch respondents from www.daarmoetikzijn.nl participated in a study (Kooiman et al. 2008) to analyse their tourism behaviour after they received their map with recommended destinations. Almost 30 % actually visited the recommended destination; 11 % for the first time. About 95 % of those respondents said that the landscape in that destination fulfilled their expectation. About 54 % of the respondents booked a hotel in their recommended destination for at least one overnight stay. About 75 % of the respondents did not visited the recommended destinations but they said they are planning to do in the future. Of these respondents, 20 % actually did search for more information about the recommended destinations. These results in the Netherlands show that the website has a positive effect on tourism.

7 Conclusion and Recommendations

The website can inspire visitors to escape from daily life and find there place to be in Europe and discover new destinations they never heard from. In the meantime science is getting a database full of individual preferences. These ‘big data’ can be used to make all kinds of analysis for the tourism industry and policy makers. Normally social science is getting information about landscape preferences using expensive questionnaires. This innovative participatory approach does not use questionnaires. The website users have their own goal to visit the website and are not being asked by the scientist and therefore their answers or preferences are more trustful. This approach is rather new in science and has to be evaluated in terms of type of visitors, their motives in visiting the websites, socio-economic features,

representative survey, etc. The limitation of this method is that the respondents are not being asked to participate. The researcher has to wait until they visit the website. Promotion efforts and making a lot of publicity are the only methods the researcher can use to get the website known and used. Also making the website more user friendly by introducing more photos and an easier way to fill in the proportions of landscape features, could stimulate the use of the website. For tourism companies, the method can be adjusted to their own website. Combining the data from e-SCAPE gives tailor made recommendations which could be interesting for a Destination Management Organization (DMO) if it wants to promote a region with a certain theme, the database of e-SCAPE could provide relevant data.

By making use of a wide range of additional geo-referenced data sets corresponding with targeted policy or research questions, the data on individual preferences can become an essential information source for the analysis of critical environmental or socio-economic queries. It gives knowledge about consumer preferences which is available and useful for actors in their negotiation and choices. The results could help maintain the identity, landscape and natural beauty of European destinations and could be develop into an attractive tool to promote Europe as a prime tourism destination. This database can be used to analyse a part of the social-economic effects of policy impacts on landscapes in regions. With e-SCAPE it is possible to compute the impact of changing or develop landscapes, for instance the impact on tourism of several agricultural scenarios or the impact of tourism on Natura2000 areas. But also to discover unknown regions with a high potential tourism value.

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