

Alessandro Inversini · Roland Schegg  
*Editors*

# Information and Communication Technologies in Tourism 2016

Proceedings of the International  
Conference in Bilbao, Spain,  
February 2-5, 2016

 Springer

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# Preface

Organized by the International Federation for IT and Travel & Tourism (IFITT), ENTER2016 eTourism Conference takes place in Bilbao, Spain, on February 2–5, 2016. The 23rd annual international conference features the latest research and industry case studies on the application of information and communication technologies (ICT) to travel and tourism. The conference theme, ‘eTourism: Empowering Places’, was an invitation to discuss the transformation in travel and tourism due to the latest development in digital technologies.

The research track of ENTER2016 received a total of 132 submissions, 103 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 members of ENTER2016 Scientific Committee assigned as reviewers. Where issues remained, additional reviews were commissioned. As a result, 56 full research papers were accepted for presentation at the conference and are included in this proceedings.

While still maintaining a broad topic of ICT applications in travel and tourism, the papers presented in this volume advance the state-of-the-art research digital marketing and social media, mobile computing and responsive web design, semantic technologies and recommender systems, augmented and virtual reality, electronic distribution and online travel reviews, MOOC and eLearning, eGovernment and sharing economy. The papers featured in 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 ENTER2016 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 ENTER2016 Overall Chair, Aurkene Alzua-Sorzabal, IFITT President, Lorenzo Cantoni, other ENTER2016 organizers, IFITT Board and

all members of IFITT for their support and for accommodating the many inquiries we have made while managing the research track.

Importantly, we thank all authors for their willingness to disseminate their latest research at ENTER2016. This conference would not be possible without their efforts.

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**Part I**  
**Website Communication**

# Bringing Online Visibility to Hotels with Schema.org and Multi-channel Communication

Anna Fensel, Zaenal Akbar, Ioan Toma, and Dieter Fensel

**Abstract** Now more than ever, it is becoming critical for businesses in the tourism industry to have a strong online presence. In order to achieve this goal, the proper use of multiple communication technologies and channels is crucial. This includes semantic annotations that can be understood by search engines, scalable multi-channel publishing, and feedback collection. We present our approach to improve touristic service providers' online visibility with techniques comprising modelling by means of ontologies, particularly, schema.org, as well as multi-channel communication. Having implemented the approach for *Tourismusverband (TVB) Innsbruck und seine Feriendörfer* as well as hotel pilots, we describe how the above mentioned technologies are being used to achieve the set goal. Our findings and results show that already in the first few weeks of deployment, with eventual decrease of human social media work power in times, the use of schema.org and multi-channel communication solutions by a typical hotel increased its website visibility by 20 %, and the leads generated by social media platforms by up to 40 %.

**Keywords** Schema.org • Hotel • Semantic annotation • Multi-channel online communication • Semantic technologies • Smart data • Social media • Rules • Marketing

## 1 Introduction

Having a good online marketing approach results in higher online visibility and ultimately leads to increased sales. In order to achieve this goal, having semantic annotations on the website that can be understood by search engines is extremely important, as it boosts the online visibility and increases the chances that the website is in the search engines' results to a relevant query. As schema.org was adopted by Google, Yahoo, Bing and Yandex, its uptake on the web has been observed as rapid and intensive (Mika & Potter, 2012). Further, it is essential that multiple communication channels (e.g. social media channels, websites, blogs, etc.)

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and technologies are used, as a large fraction of potential customers are present there.

Almost all the regional tourism boards in the Alps have continued to enhance the quality performance of their websites for the last 10 years (Mich, 2013). However, most touristic service providers nearly fail completely when it comes to using Web technologies (including Linked Data and semantic annotations), either by not using them at all or by using them only minimally and mostly inappropriately (Stavarakantonakis, Toma, Fensel, & Fensel, 2013). Namely, Stavarakantonakis et al. (2013) analysed more than 2000 touristic service providers, namely hotels and hotel chains in Austria. In contrast, intermediaries such as booking engines (e.g. booking.com, hrs.de) have been using these technologies nearly perfectly. In social media, hotels in the European region are still in the first stages of developing strategies that present a moderate level of integration among different media (Minazzi & Lagrosen, 2013), and the use of multiple social media channels is still experimental and not fully utilized within the destination marketing organization of the top 10 most visited countries by international tourists (Hays, Page, & Buhalis, 2013).

In this work, we suggest a new approach and solution to efficient semantic-based multi-channel communication that could bring the highest visibility to the touristic service providers. We have deployed and validated it with the TVB Innsbruck<sup>1</sup> and a number of hotels, demonstrating that using multiple communication channels and the latest Web technologies, including Linked Data and semantic annotations, brings concrete, measurable benefits to online communication in terms of effectiveness and efficiency. Using the Kayzers<sup>2</sup> hotel as an example, we show that our solution of online marketing brings immense benefits to the hotel business owners.

The TVB Innsbruck is one of the biggest tourism boards in Austria. It combines 41 holiday destinations under its umbrella and has more than 12,000 members. Serving touristic service providers, it faces the challenge of being visible at its best in search engines, but also in the constantly growing number of other communication channels. In 2014, it distributed more than half a million emails of monthly newsletters in 5 languages, made 4 regional campaigns in 7 countries, ran 5 websites, 3 mobile apps and 6 social media channels in 9 languages. This was all executed by a team of editors and a blogger network.<sup>3</sup> Given this complexity and scale, the main goal of our cooperation is to improve the visibility of the TVB Innsbruck by enriching the content of its online presence and by developing a simple, and as much as possible automatic, solution to disseminate information and to collect feedback in various communication channels.

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<sup>1</sup> TVB Innsbruck: <http://www.innsbruck.info>

<sup>2</sup> Hotel Kayzers: <http://www.kaysers.at>

<sup>3</sup> Renate Leitner (TVB Innsbruck) and Anna Fensel (University of Innsbruck). “#Love Innsbruck# Ein Erfahrungsbericht”, Mayrhofen, Austria, 16.05.2014, TourismFastForward Conference ([www.tourismfastforward.com](http://www.tourismfastforward.com); Tourismus2020 in the past). Video of the talk: [https://www.youtube.com/watch?v=N34fq\\_frz6A](https://www.youtube.com/watch?v=N34fq_frz6A)

The Kaysers hotel is located in the province of Tyrol, in the area of Mieming, which is ca. 45 km west from Innsbruck. This is a 4-star property, with 48 rooms, and it offers and promotes a large variety of activities in the hotel itself, as well as in the province of Tyrol: golf, skiing, tennis, hiking, city trips, etc. The hotel had a limited web presence before the study: its own website, a presence on booking platforms, and very limited own use of social media, mainly occasional use of Facebook. Therefore, this hotel has been an ideal candidate on which to apply our automated content marketing solution, which helps the hotel generate and distribute relevant content.

Our semantic approach to enhance the TVB Innsbruck visibility is based on two main features: (1) inclusion of semantic annotations in the TVB website and (2) uniform dissemination of content through multiple channels. To achieve this goal we conducted the following activities: (1) Analysis of TVB and hotel content, (2) Design and application of an ontology, primarily reusing schema.org, (2) Mapping of content from the different channels to the common framework, (3) Design of publication rules, (4) Implementation of the TVB and hoteliers' sites and (5) Evaluation.

The paper is organized as follows. Section 2 describes state of the art and related work. Section 3 presents the semantic approach and ontology we have developed in order to provide a unified and integrated framework of all the disseminated content by TVB Innsbruck and Kaysers hotel through their multiple channels. Section 4 describes the implementation of the pilot: TVB Innsbruck alignments between the content published in TVB Innsbruck's social media channels and the developed ontology; the implementation of the semantically-enabled TVB Innsbruck website: mapping of feratel content to schema.org, the content to ontology mapping, and the functional core of publishing: overview of the publication rules we have defined together with the TVB Innsbruck and hotels. Section 5 summarises our evaluation of findings. Section 6 concludes the paper and provides a discussion on the future outlook.

## 2 Related Work

Compared to the existing work in the immense area of leveraging the information and communication technologies (ICT) into the tourism sector, we aligned our work to at least two topics as described below.

**Use of Semantic Web Technologies in Tourism** Data heterogeneity and isolation remain big problems on the web. In the tourism domain, a lot of work has been done to solve the problem by utilising semantic web technologies to enrich information, enabling machine process-able and interpretable data, in a way the data will be easy to find, connected and integrated. There are four application scenarios of applying the semantic web into tourism information systems (Maedche & Staab, 2002): (1) semantic search that allows for querying distributed data, (2) semantic portal



that integrates available information based on topic or location, (3) semantic-based electronic markets that enable matching between providers and requesters, (4) transactional web service that enables automatic web service discovery, execution, composition and interoperation. More specifically, ontology as a formal, explicit specification of a shared conceptualisation (Studer, Benjamins, & Fensel, 1998) has been applied in the e-Tourism area almost since its very appearance. For example, the Harmonise project (Fodor & Werthner, 2005) was one of the early adopters in this area. Further, Cardoso (2006a) introduced an e-Tourism ontology to answer three main questions in developing tourism applications: ‘What can a tourist see?’, ‘What are the interesting places to see and where are they?’, and ‘When can a tourist visit a particular place?’ A hotel matching framework was introduced by Niemann, Mochol, and Tolksdorf (2008) to search and rank hotels in various contexts (location, feature, price, etc.). It uses two main ontologies: person and hotel as well as sub-ontologies point-of-interest, hotel features, passenger transportation, etc., such that the framework can be used to match the available hotels to the user’s context. A prototype system that combines semantic web technologies with traditional e-Tourism applications was developed by Damljanovic and Devedžic (2009) to enable data exchange between different e-Tourism systems in order to ease the process of maintaining the systems for tourist agencies as well as easing the process of searching for perfect vacation packages for tourists. In particular, systems based on modular approaches catering delivery of personalised applications e.g. geo-spatial, have been addressed (Barta, Feilmayr, Proll, Grun, & Werthner, 2009), where a core Domain Ontology for Travel and Tourism (cDott) was introduced as the core domain ontology for the tourism sector for integration of ontologies in a way in which the ontologies could be extended modularly. Particularly in Austria, even though the semantic annotation could improve the visibility of touristic service providers (Toma, Stanciu, Fensel, Stavrakantonakis, & Fensel, 2014), the content itself and machine access to the web content has been lacking up till now (Hepp, Siorpaes, & Bachlechner, 2006), and especially in online direct marketing, the semantic web technologies are not used properly by hotels (Stavrakantonakis et al., 2013).

Here, we follow the best practices of the past, while applying the schema.org extension, as it has become the de-facto standard, and is of clear practical relevance in recent years.

**Multi-channel Communication Solution** In a networked environment such as the web, all organisations in the tourism sector are facing a dynamic and innovative industry. Interoperability and/or integration of multiple platforms have been identified as major issues, and specifically multi-channel communication and advertisement on social web platforms and integration with Customer Relationship Management (CRM) systems (Werthner et al., 2015). Multiple channels (i.e. social media) have shaped consumers discussions in promotional mix, enable companies to talk to their customers on various different channels as well as enable customers to talk directly to one another (Mangold & Faulds, 2009). Social media also improves the quality of travel-related searches (Xiang & Gretzel, 2010), where

they found a significant amount of search results representing social media in Google, indicating that search engines likely direct travellers to social media sites. Multiple online information sources and channels contribute differently in the travel planning process (Fotis, Buhalis, & Rossides, 2012; Stienmetz & Fesenmaier, 2013).

Commercial social media management tools like HootSuite,<sup>4</sup> BufferApp<sup>5</sup> and many more realized the signs of the times and built toolkits to manage communication via Web 1.0 channels (Email, Blog) and via social Web 2.0 channels, e.g. Facebook or Twitter. Most of them provide capabilities to post in many streams via one click, using simple mechanisms to adapt the content to fit the channel output. Additionally, most of the toolkits provide processing of the content, allowing the user to create statistics and publish posts as well as retrieve feedback. However, currently none of the toolkits support the user in offering marketing content, automatic generation of social media posts, showing where to publish, or to whom to deliver the marketing content.

Further applications based on e-Tourism ontologies and structured data include dynamic touristic service packaging (Cardoso, 2006b; Fensel, Kärle, & Toma, 2015). Again, we are able to demonstrate real-life deployment and validation of some of the early theoretical principles, expressed there, e.g. semantic service composition.

**Our Contributions** Compared to the existing work, our work is utilising semantic web technologies in the touristic sector by: (1) increasing the findability of a website through semantic annotation, (2) integrating the distributed and isolated content sources by collecting the annotated content, (3) distributing the collected content to multiple social media channels.

Above all, the last two contributions were performed in a semi-automatic, semantically-empowered way, by utilising a rule-based system.

### 3 Ontology and Its Schema.org Model

In this section, we describe how we have chosen the ontology and its schema.org implementation, basing on the contents from TVB Innsbruck and the Kaysers hotel. The main goal of this analysis was to derive the key concepts to be modelled in the ontology. We have analysed the TVB Innsbruck's and Kaysers's websites and their publication to social media channels, as well as interviewed their personnel.

After the analysis of the TVB Innsbruck's website and TVB Innsbruck's Facebook we found out that relevant information for dissemination can be classified

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<sup>4</sup> HootSuite: <https://hootsuite.com>

<sup>5</sup> BufferApp: <https://buffer.com>

according to the following categories: (1) Hotels, (2) Food and Drink Establishments, (3) Events, (4) Trips, (5) Place of Interest and (6) News.

On the other hand, it was found that the TVB Innsbruck's Facebook page offers short textual descriptions, photos and videos about the following topics: (1) Events, (2) Place of Interest, (3) News and (4) Food and Drink Establishments. These concepts identified in the analysis were initially used as main concepts to be modelled in the ontology, as described in detail in the technical report (Akbar, Lasierra & Tymaniuk 2014b). Further activities included a deep analysis of other organisations' channels and interviews and discussion sessions with TVB Innsbruck's personnel.

From the Kaysers hotel website we have identified six categories of content: The Kaysers, Rooms and Prices, Wellness, Nature and Indulgence, Activities, and Contact, and we classified them into the following categories: (1) Hotels, (2) Offers, and (3) News (Akbar & Toma, 2015). The category Hotels contains information about the entity of the hotel itself such as the address, phone, and email. The category contains various information of offered services from the room as well as other services such as spa, message, tennis, and so on. The last category News contains general information, from information about the weather, latest news from the hotel or information from the surrounding area, and so on.

## 4 Implementation

This section describes the specifics of the TVB Innsbruck and Kaysers pilot and its implementation, namely: (1) Contents to ontology mappings, (2) Semantic enrichment of the TVB Innsbruck and the Kaysers hotel's website, (3) Social media publication rules and process.

### 4.1 Contents to Ontology Mapping

To construct content to ontology mappings—to be used for the rule-based information dissemination, we consider only those classes and properties which have associated information items in TVB's and Kaysers's website and social media channels. Firstly the history of published content was analysed for last 6 months; afterwards, the content was divided into information items and mapped with the vocabulary, namely Schema.org as defined in a technical report by Akbar, Lasierra, et al. (2014b). Of course not all of the schema.org terms are relevant for the tourism domain. For the TVB Innsbruck website in particular the relevant schema.org terms are those that belong to the categories Hotels, Food and Drink Establishments, Events, Trips, Place of Interest and News. Most of the content on the TVB Innsbruck website is pulled from an external data source provider, namely feratel

media technologies AG.<sup>6</sup> More precisely, this includes: Hotels, Apartments, Camping, Restaurants, Bars or Pubs, Cafes, Events and Sightseeing. In the case of TVB Innsbruck's Twitter channel, it was discovered that there were no posts related to Hotels, Food and Drink establishments, rather the posts related to Trips, Place of Interests and News. In the case of TVB Innsbruck's YouTube channel, the published videos are related to Food and Drink establishments, Events, Trips, Places to visit and News items.

In the case of the Kaysers hotel, we mapped three obtained main concepts (Hotels, Offers, and News) into three relevant classes from Schema.org: Hotel, Offer and Article (Akbar & Toma, 2015). Additional classes were used to confirm the class and sub-classes relationships of Schema.org. Those additional classes are: PostalAddress and AggregateRating as sub-classes of Hotel, PriceSpecification and QuantitativeValue as sub-classes of Offer.

## 4.2 *Semantically Enriching the Websites*

In order to inject the semantic annotations into the TVB Innsbruck website, we have extended the integration of the TVB Innsbruck website and the feratel system. The integration is implemented as a Typo3<sup>7</sup> extension plugin, referred to as *seo\_feratel* (Toma et al., 2014). TVB Innsbruck website is built using the Typo3 content management system, and the Typo3 extensions *seo\_feratel* is responsible for periodically getting content from feratel and showing it in the Typo3 website.

In the case of the Kaysers hotel, we found no suitable plugin yet available to inject the annotation into the website. Therefore, the annotation was injected directly through the database (Akbar & Toma, 2015). In total, we were able to annotate more than 200 pages and sub-pages in three different languages (German, English, and French).

## 4.3 *Publication Rules and Process*

We utilised the publication rules (Akbar, Garcia, Toma, & Fensel, 2014a) to determine: (1) what contents will be disseminated to which channels, (2) the sequence of the disseminations of a content to multiple channels, (3) how a content should be disseminated to a channel. Rules are form of knowledge representation where a rule is represented in form **IF** < **Condition** > **THEN** < **Action** >. Condition can be a detection to a particular type of content, while action can be, in particular, a publication action, transformation action.

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<sup>6</sup> Feratel: <http://www.feratel.at>

<sup>7</sup> Typo3: <http://www.typo3.org>

Based on the ontology categories previously considered, we determined the publication rules by answering the following four questions:

1. (Existence) Can we find similar categories in an output channel? If yes, then there is a mapping between the categories to that channel.
2. (Workflow) Is there any data dependency between channels? If yes, then the publication to this channel must hold until the publication to the other channels have been successfully performed.
3. (Content Transformation) How should the content be presented in a channel? This question is intended to determine the required content transformation for each category to fit it into the channel's requirements.
4. (Scheduling) How many contents should be published to a specific channel within a particular time?

The answer for each of the above questions is described as follows.

**Existence of Content to Channel Mapping as Rules** The mapping is representing a relation between the content categories and the available channels. If a similarity between the content of the website and the content of a channel is detected then we conclude there is a mapping between them (Akbar & Garcia, 2014).

**Workflows as Rules** Another important aspect that needs to be considered when determining the publication rules is the workflow. If there is a data dependency between two channels, then we have to make sure the publications of a common content to both channels are in correct order.

**Content Transformation as Rules** While a content item could have rich items, a channel has specific requirements that have to be followed. The process to transform the content items into an accepted format based on the channel requirements is called content transformation. We implemented content transformation as part of publication rules (Akbar, Garcia et al., 2014a), where users are capable of choosing various transformations to be applied to a specific input content whenever the content is published to a particular channel.

Listing 1 shows an example of rules in the form of Drools Rule Language,<sup>8</sup> where the first rule is a mapping rule to detect if there is an Event then publish it to channel Facebook. The second rule is a workflow rule, to detect if there is an Event and it has been published to channel Facebook then publish it to channel Twitter.

### Listing 1

#### Publication Rules

```
rule "Publish Events to Facebook"
```

(continued)

<sup>8</sup> Drools Rule Language: <https://docs.jboss.org/drools/release/5.2.0.Final/drools-expert-docs/html/ch05.html>

```

when
  i : Events()
then
  insert(ItemToBePublished(i, channelFacebookWall));
end
rule "Publish Events to Twitter"
when
  i : Events()
  f : ItemToBePublished(i, channelFacebookWall)
then
  insert(ItemToBePublished(i, channelTwitter, f.url));
end
    
```

**Scheduling as Publication Calendar** Another important aspect in publication is how often a content is published to a specific channel. According to the administrator of TVB Innsbruck’s social media, regular posting to Facebook is 2 posts per day and the publication to Facebook is synchronized automatically with Twitter, but sometimes an independent Tweet is also required. We implemented the scheduling by giving the users a publication calendar where they can define what time the content should be published.

Our implementation of the tool supporting the above functionality is Onlim Tell-it!,<sup>9</sup> and its view of the publication calendar is shown at Fig. 1. It enables users (here, a hotel) to manage their publication schedule by specifying when and where

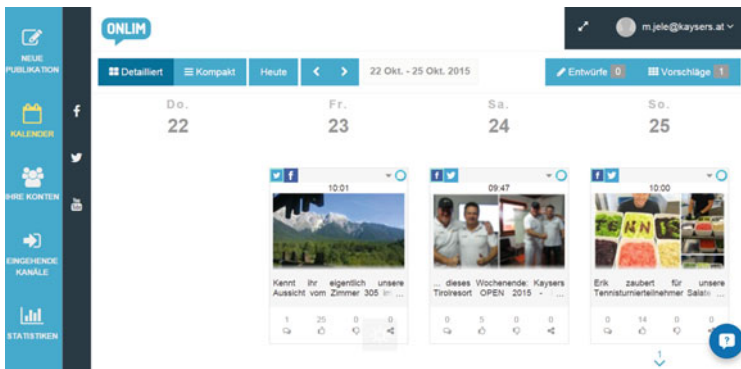


Fig. 1 Publication calendar in Onlim Tell-it!

<sup>9</sup> Onlim Tell-it!: <https://tell-it.onlim.com>

content will be published. The initial publications and their flow are pre-created by the semantic rules, as described above. The default configuration of these rules are pre-defined by social media experts, in consultation with the typical hotel pilots. When published, each posted content is associated with received feedback (e.g. likes, comments) from every channel.

Ultimately, there are two sources of online visibility provided by semantic web technologies. The first source is via search engine visibility through semantic annotation. The second source is from social media visibility through multiple-channel content integration and dissemination, where the integration and dissemination can be performed semi-automatically by using publication rules integrated with publication scheduling.

## 5 Evaluation

We have already performed a preliminary evaluation in order to measure the impact of having deployed semantic annotations according to schema.org on the TVB Innsbruck website. Particularly, we have demonstrated a complete technical feasibility of our solution, as well as an increase in visitors to the website (Toma et al., 2014).

Here, we also analyse the impact on the hotel's visibility which our solution has created, primarily based on the data of Kaysers hotel from Google Analytics and open web sources. We compared data of traffic to the website of Kaysers hotel before and after using Onlim Tell-it!, a multi-channel management tool which leverages semantic web technologies as described in this paper. The Kaysers hotel began using the tool intensively in July 2015, thus in this evaluation we collected data of website traffic from May to June 2015 and July to August 2015 as representation of before and after the deployment of the tool respectively. Both periods fall within the summertime, and the hotel and touristic sector generally observes the same level of touristic activity. Also, no other extra-curriculum activities, apart from using Onlim Tell-it!, have been performed by the hotel. A hotel which is not using any social media marketing tool has typically one employee spending an average 3 h a day on manually managing the hotel social media presence. The tasks performed by such employee include: finding content sources on the web which are relevant to the hotel audience, defining the content of the posts, manually customizing the actual posts to fit in different social media channels, checking feedback on each social media channel, etc. Our approach and tool, Onlim Tell-it!, substantially automate these tasks.

The results of our evaluation, explained in terms of the overall traffic increase to the hotel's website, the direct leads to it from social media platforms, and time spent on social media management by the hotel employee, are as follows.

**Traffic to Website** Figure 2 shows overall traffic to the website during the periods before and after deployment. The number of *Sessions* has increased by 24.97 %



**Fig. 2** Comparison of traffic to website before and after using Onlim Tell-it!

Social Network	Sessions	% Sessions
<b>Facebook</b>		
May 3, 2015 - Jun 30, 2015	50	94.34%
Jun 30, 2015 - Aug 27, 2015	71	97.26%

**Fig. 3** Comparison of traffic to Kaysers website originating from Facebook

(4669–6223), *Users* by 20.63 % (3502–4412), and *Pageviews* by 15.80 % (25,232–29,968).

We also collected about 100 of the latest tweets from Kaysers. Then, we identified what kind of social media tools were used to distribute those tweets. Our result shows that 92.1 % of tweets were disseminated through Onlim Tell-it!, only about 4.5 % were disseminated through the Twitter web client. Thus, the hotel has been clearly and predominantly using Onlim Tell-it!.

**Traffic to Website Originated from Social Media** We observed that traffic originated directly from social media, as it has been especially relevant for our multi-channel communication section. The results for Facebook, as the most common channel, are shown in Fig. 3: the social network sessions created by this platform increased by ca. 40 % after the tool deployment i.e. the pilot has been clearly using the set-up.

It is also worthwhile to mention that the tool has enabled the Kaysers hotel to engage and bring more visitors from Google+ (increase of 37.7 %) and Twitter (increase of 100 %). These are channels that the hotel was not able to serve extensively before due to time restrictions of marketing staff. Here we expect a further traffic increase from these and other social media channels supported by Onlim Tell-it!.

**Work Time Spent by the Hotel on Social Media Management** Taking the concrete example of Hotel Kaysers, they used to spend 2.5 h a day for their social media activities. Since they started using Onlim Tell-it!, they use 1 h only to perform their social media marketing activities.



## 6 Conclusion

In this paper we have presented our pilot with the *Tourismusverband (TVB) Innsbruck und seine Fereindörfer*, and the use of its content by touristic service providers, namely, hotels. The goal was to showcase possible applications and added value of the semantic technologies, particularly, semantic annotations and multi-channel information dissemination, for touristic service marketing stakeholders. We have demonstrated that our approach has facilitated the increase of visibility and customer touch points online for the hotel, and exemplified it with a real-life system user, the Kaysers hotel: a ca. 20 % increase to its website, and up to 40 % growth of the social media leads, and a ca. 2.5 less worktime spent in social media, resulting solely from our approach application.

We have created semantic annotations for the content of the touristic association, as well as for hotels, according to popular vocabularies, specifically, schema.org. We have applied schema.org-based ontologies as a basis for automation of multi-channel communication tasks. Currently we are looking into defining more advanced schema.org touristic vocabulary parts (e.g. exact service offers of hotels) a turning them into official schema.org extensions.

Furthermore, we have created and set up an approach and tool - Onlim Tell-it!, executing dissemination to multiple social media channels. Currently, our tool is capable of automated and intelligent publishing of content in the following channels: Facebook (text, image, link, and video), Twitter (text, image, and link), LinkedIn (text, link), Flickr (image, video), and YouTube (video), creating content based on the sources annotated with schema.org.

Some limitations of the current work included the fact that the insertion of the semantic annotations in the innsbruck.info website is not always integrated with the systems that initially generate the actual touristic data. In this case, we have applied a schema.org annotations plugin that is able to insert annotations not at the destination (e.g. touristic association website), but rather at the source (e.g. feratel).

In the area of multi-channel communication, there are still many relevant channels that need to be integrated; also, in some cases, such integration is complicated by the fact that the APIs of some channels are only restrictively open or non-existent (e.g. as in the case of Google+ and Instagram). When it comes to the content and data, we are working to optimise the automated selection, reuse and spread of the content and data. Also, for dynamic content and data reuse from third-party sources, appropriate licensing models would need to be found.

Thus, we have demonstrated how a touristic association and its' hotel customers can be brought forward and become more automated in their marketing activities, employing the approach of semantic annotations and online multi-channel communication. With more hotels and other businesses using Onlim Tell-it! in the future, we will be able to deliver even more evidence and precision on the added value of the results. Eventually, our expectation is that the touristic structured data will serve as a powerful enabler for the touristic services provided online, and will contribute to the establishment of Tyrol as a role model region for e-Tourism.

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## References

- Akbar, Z., & Garcia, J. M. (2014). *Tourismusverband publication rules*. Technical Report, Semantic Technology Institute, University of Innsbruck. Retrieved from <http://oc.sti2.at/results/white-papers/tourismusverband-publication-rules>
- Akbar, Z., Garcia, J. M., Toma, I., & Fensel, D. (2014a). On using semantically-aware rules for efficient online communication. In A. Bikakis, P. Fodor, & D. Roman (Eds.), *Rules on the web. From theory to applications* (pp. 37–51). Springer.
- Akbar, Z., Lasierra, N., & Tymaniuk, S. (2014b). *Tourismusverband innsbruck ontology*. Technical Report, Semantic Technology Institute, University of Innsbruck. Retrieved from <http://oc.sti2.at/results/white-papers/tourismusverband-ontology>
- Akbar, Z., & Toma, I. (2015). *Annotation of Kaisers.at Website with Schema.org*. Technical Report, Semantic Technology Institute, University of Innsbruck. Retrieved from <http://oc.sti2.at/results/white-papers/annotation-kaisersat-website-schemaorg>
- Barta, R., Feilmayr, C., Proll, B., Grun, C., & Werthner, H. (2009). Covering the semantic space of tourism: An approach based on modularized ontologies. *Proceedings of the 1st workshop on context, information and ontologies* (pp. 1–8). ACM.
- Cardoso, J. (2006a). Developing an owl ontology for e-tourism. In J. Cardoso & A. Sheth (Eds.), *Semantic web services, processes and applications* (pp. 247–282). Heidelberg: Springer.
- Cardoso, J. (2006b). Developing dynamic packaging systems using semantic web technologies. *WSEAS Transactions on Information Science and Applications*, 3(4), 729–736.
- Damljanovic, D., & Devedžić, V. (2009). Applying semantic web to e-tourism. In Z. Ma, & H. Wang (Eds.), *The semantic web for knowledge and data management* (pp. 243–265). IGI Global.
- Fensel, A., Kärle, E., & Toma, I. (2015). TourPack: Packaging and disseminating touristic services with linked data and semantics. In *Proceedings of the 1st international workshop on semantic technologies (IWOST)*, CEUR Workshop Proceedings, Vol-1339, ISSN 1613-0073, pp. 43–54, 11–12 March 2015, Changchun, China.
- Fodor, O., & Werthner, H. (2005). Harmonise: A step toward an interoperable e-tourism marketplace. *International Journal of Electronic Commerce*, 9(2), 11–39.
- Fotis, J., Buhalis, D., & Rossides, N. (2012). Social media use and impact during the holiday travel planning process. In M. Fuchs, F. Ricci, & L. Cantoni (Eds.), *Information and communication technologies in tourism 2012* (pp. 13–24). Vienna: Springer.
- Hays, S., Page, S. J., & Buhalis, D. (2013). Social media as a destination marketing tool: Its use by national tourism organisations. *Current Issues in Tourism*, 16(3), 211–239.
- Hepp, M., Siorpaes, K., & Bachlechner, D. (2006). Towards the semantic web in e-tourism: Can annotation do the trick? In *Proceedings of the 14th European conference on information system (ECIS)*, (pp. 2362–2373).
- Maedche, A., & Staab, S. (2002). Applying semantic web technologies for tourism information systems. In K. Wober, A. Frew, & M. Hitz (Eds.), *Proceedings of the 9th international conference for information and communication technologies in tourism* (pp. 311–319), Springer.
- Mangold, W. G., & Faulds, D. J. (2009). Social media: The new hybrid element of the promotion mix. *Business Horizons*, 52(4), 357–365.

- Mich, L. (2013). The website quality of the regional tourist boards in the alps: Ten years later. In Z. Xiang, & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 651–663). Springer.
- Mika, P., & Potter, T. (2012). Metadata statistics for a large web corpus. *LDOW*, 937.
- Minazzi, R., & Lagrosen, S. (2013). Investigating social media marketing in the hospitality industry: Facebook and European hotels. In Z. Xiang, & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 145–157). Springer.
- Niemann, M., Mochol, M., & Tolksdorf, R. (2008). Enhancing Hotel Search with Semantic Web Technologies. *Journal of Theoretical and Applied Electronic Commerce Research*, 3(2), 82–96.
- Stavrakantonakis, I., Toma, I., Fensel, A., & Fensel, D. (2013). Hotel websites, Web 2.0, Web 3.0 and online direct marketing: The case of Austria. In Z. Xiang, & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 665–677). Springer.
- Stienmetz, J., & Fesenmaier, D. (2013). Online Channel Use and Destination Advertising Response. In L. Cantoni, & Z. Xiang (Eds.), *Information and communication technologies in tourism 2013* (pp. 530–542). Springer.
- Studer, R., Benjamins, V., & Fensel, D. (1998). Knowledge engineering: Principles and methods. *Data and Knowledge Engineering*, 25(1–2), 161–197.
- Toma, I., Stanciu, C., Fensel, A., Stavrakantonakis, I., & Fensel, D. (2014). Improving the online visibility of touristic service providers by using semantic annotations. In V. Presutti, E. Blomqvist, R. Troncy, H. Sack, I. Papadakis, & A. Tordai (Eds.), *The semantic web: ESWC 2014 satellite events* (pp. 259–262). Springer.
- Werthner, H., Alzua-Sorzabal, A., Cantoni, L., Dickinger, A., Gretzel, U., Jannach, D., et al. (2015). Future research issues in IT and tourism. *Information Technology and Tourism*, 15(1), 1–15.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179–188.

# Automatic Persistent Personalization of Ads in Tourism Websites

Alberto Rezola, Aitor Gutierrez, and Maria Teresa Linaza

**Abstract** Information and Communication Technologies (ICT) have dramatically increased the ability of advertisers to target advertising campaigns and make sure that ads are shown to only certain targeted groups of people. Usage of appropriate ads to each visitor may increase Click Through Rates (CTR) and chances of conversion. This paper presents a novel online advertising approach for automatic “persistent personalization” of Web ads on the basis of Web-mining techniques that combine representative parameters for advertising in a unique platform. The functionality of the approach as well as the problems that arose during the implementation are posed and discussed. Finally, the recommendation system has been successfully validated in a travel blog Website. The implemented prototype made it possible to serve the appropriate ads to the targeted audience on the basis of the classification of user profiles. The obtained CTR was the double of the expected common CTR rates in online advertising campaigns.

**Keywords** Ad personalization • Persistent personalization • Supervised learning • Implicit user profiling • Hybrid recommender system

## 1 Introduction

Many studies have generally found a negative public attitude towards advertising, with consumers often annoyed due to intrusive advertising messages (Donnell & Cramer, 2015; Tsang, Su-Chun, & Ting-Peng, 2004; Wang, Zhang, Choi, & Eredita, 2002; Watson, McCarthy, & Rowley, 2013; Zanut, 1984). However, this consumer attitude can change when advertising is personalized and relevant to the lifestyle of the consumer (Goldfarb & Tucker, 2011). Information and Communication Technologies (ICT) have dramatically increased the ability of advertisers to target advertising and make sure that ads are shown to only certain targeted groups of people (Tucker, 2012).

Web advertising personalization controls the visualization of campaigns to appropriate customers at the proper time based on the user preferences. For

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example, users reading articles about traveling regularly may be interested in flight booking. Thus, travel Websites should display ads of airlines offers and discounts. In such way, the usage of appropriate ads to each visitor may increase Click Through Rates (CTR) and chances of conversion. Obviously, the more detailed the representation of the context of the user is, the more effective these approaches become.

This paper presents a novel online advertising approach for automatic “persistent personalization” of Web ads on the basis of Web-mining techniques that combine representative parameters for advertising in a unique platform: most suitable content of the Website of the advertiser; probability of the click-through; advertising targets arising from contracts with advertisers; and fuzzy mechanisms. This approach has been named “*Sistema Publicitario Integrado de Gestión Automática*” (eSPIGA).

The rest of this paper is structured as follows. Section 2 describes the research background related to ad personalization and recommendation. Section 3 describes the research hypothesis that will be validated. Section 4 describes the eSPIGA system which has been implemented to validate such hypothesis, while Section 5 summarizes the validation of the system in a travel blog Website. Finally, Section 6 contains the conclusions.

## 2 State of the Art

While traditional media (e.g. TV, radio station, newspaper, billboards) advertise products and services non-selectively to people, sponsors are more interested in personalized ads that present products and services for their prospective customers. Sponsor interest in personalized advertising lies on ad personalization strategies so as to minimize the costs of marketing campaigns while maximizing their impact. Personalized advertising also has focused the attention from researchers in multimedia, e-commerce and Artificial Intelligence because contents and presentations can be tailored to the user preferences in order to maximize their attention.

Personalized recommendation systems aim at presenting online content tailored to the specific interests of each user (Tucker, 2012). The personalization of ad recommendation has received particular interest from the research community in recent years, since the Internet business model heavily relies on advertising. However, personalizing ad recommendation is challenging, since the lack of the metadata associated to ads makes it very difficult for recommender systems to adequately filter ads.

In a conventional approach for the provision of personalized contents, the ad platform either contains a server that keeps track of the user preferences and interactions (e.g., Webpage visits, search keywords, shopping transactions) or requires that the interaction device of the user (e.g., mobile devices, Web browsers, IPTV) sends his personal information over the network in order to select pertinent ads.

However, these approaches have potential threats to the privacy of the customers. For instance, his personal information could be disclosed in the process of collecting and managing his profile in a system based on a server storing user profiles. If the system is violated, the privacy of thousands of customers will be threatened.

Ad personalization is a challenging research topic for current advertisers, which aims at assigning a suitable ad to a single Web user rather than a group of individuals. To achieve this challenge, personalization systems need to have some input about the user. One of the current approaches to create such profiles takes advantage of the information gained during the registration process or just asks questions to the users about their preferences (explicit user profiles). Many personalized advertising methods have been proposed on the basis of explicit user profiles, which are gathered, maintained, and analysed by the system (Bilenko & Richardson, 2011; Bleier & Eisenbeiss, 2015). However, this process can discourage many users.

On a research level, AdRosa is an advertising tool that works through remote open site agents. It deals with the automatic personalization of Web ads without using explicit user personal information, but their navigation patterns in order to maintain the privacy of the users. The functionality of the system is based on deriving the needed knowledge from Webpage content, previous sessions and current behaviour of users (Kazienko & Adamski, 2007).

Furthermore, Bae, Park, and Ha (2003) developed a system based on Web usage mining to cluster navigation paths to create usage patterns. Pages were manually classified from both the Website of the publisher and the target sites of the advertisers into thematic categories. Appropriate ads were assigned to each active user according to the pages and categories visited during the current session. Such matching was based on fuzzy rules stored in the system.

The commercial online advertising system AdSense (Google Ads) delivers a targeted ad to the Website of a publisher and consists of two options: “AdSense for content” and “AdSense for search.” While the former delivers appropriate text or image ads based on the content of a site of the publisher, the latter encourages publishers to add the Google search box to their pages, so a set of targeted text-based ads are attached to the search result pages in the form of “sponsored links”. The complementary Google program, AdWords, is targeted to advertisers, who define keywords associated with their ad, so that Google matches the available ad subset with all activities in which given keywords occur (Davis, 2006).

Similarly, Rusmevichientong and Williamson (2006) studied algorithms for the selection of profitable search keywords that are especially useful for fixed advertising budgets. Since the AdSense system can access only data available for the Google search engine and the content of Websites, it is able to provide only “ephemeral personalization” of advertising. The ephemeral approach can deliver a different item on every page of a Website but be the same for all users (Schafer, Konstan, & Riedl, 2001). The more adaptive method—“persistent personalization”—uses the history of a user’s behaviour and generates a different item for each user in each context. However, Barford, Canadi, Krushevskaja, Ma, and

Muthukrishnan (2014) analysed the personalization over 175 K distinct display ads from a variety of Websites and they found that while targeting was widely used, there were many remaining instances in which delivered ads did not depend on the profile of the user.

### 3 Research Hypothesis

Technological advances mean that consumer information can be used to personalize the actual content of the ads shown in order to match the interests of the user.

#### **H1: Web ads can be automatically personalized to different user profiles**

Advertising campaigns are generated for specific audience targets, which are based on different demographic parameters such as gender, age range, user preferences and localization of the users. It is assumed that online activities and behaviours of the users are diverse enough to allow the characterization of different user profiles and preferences. Thus, it is possible to serve the appropriate ads to the targeted audience on the basis of the classification of user profiles in an automatic way.

The main objective of the user modelling is to collect as much data as required about the user and then customize the advertising content to fulfil the preferences of the users. In order to build user profiles, only explicit information of the customers will be used.

#### **H2: User preferences can be obtained implicitly from the Web usage data**

As a user navigates the Web, his navigation activity can be obtained and stored. This information, along with the content analysis of each visited Webpage, serves to determine the major topics of interest of the user (i.e. user preferences). Creating an accurate user profile is challenging, since the appropriate set of data about users should be collected in a usable way.

In general, user profiling for advertising purposes is related to the knowledge generation about the gender, age range and user preferences on the basis of the Web navigation. In order to add gender and age range profiling to user model generated from the Web usage data, the following hypothesis will be considered.

#### **H3: Available surveys and statistics about demographics and Internet services can provide a clear insight of the preferences of the users**

The main challenge of the proposed approach is the use of only implicit information. Thus, no personal information about users is known, i.e. all users are considered as non-registered. In this scenario, gender and age range characterization of online users is not obvious. In particular, merging Web usage data of the users with available surveys and statistics that relates demographics and Internet services, aids to solve the cold start problem for non-registered users, i.e. this

system can be used to train and enhance profiling algorithms to infer user profiles when no previous data is available.

### 4 The Concept of the eSPIGA System

The proposed method for automatic “persistent personalization” of Web ads is based on Web-mining techniques that combine representative parameters for advertising in a unique platform: the most suitable content of the Website of the advertiser; the probability of the click-through; the advertising targets arising from contracts with advertisers; and fuzzy mechanisms.

Figure 1 displays the general scheme of the eSPIGA system, which includes both, authoring tool to manage the advertising campaigns and the Websites; and the analytics dashboard to analyse the results of the ad campaigns and users’ profiles. First, Web content data of a publisher is processed using Natural Language Processing (NLP) algorithms to index the content of all pages of the Websites. Terms obtained from the HTML content are filtered on the basis of several categories to classify such pages.

Secondly, the acquisition of HTTP requests and the extraction of the sessions of the users are necessary to determine the usage mining data, which is the set of historical user sessions together with information about the ads clicked during these sessions. The current user behavior consists of data about visited pages as well as

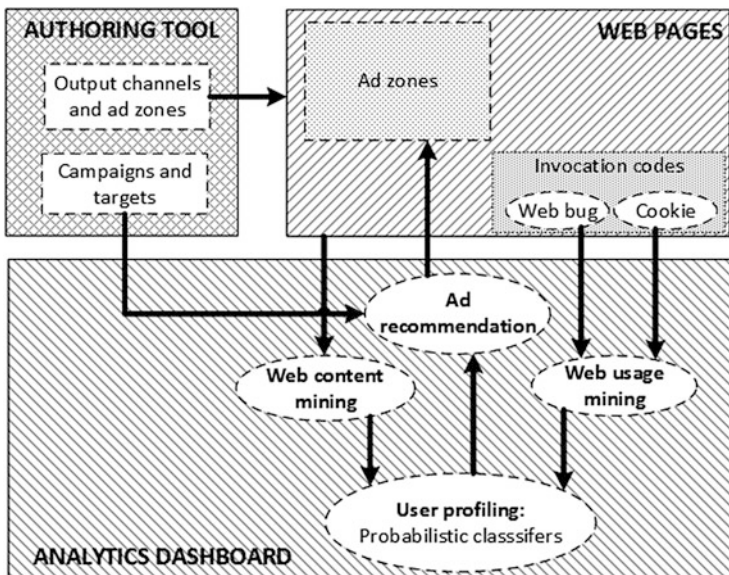


Fig. 1 Overview of the persistent personalization approach of eSPIGA system



the viewed and clicked ads during the active session. Such data is obtained using Web-bugs and cookies to categorize users into user profiles.

Finally, the advertising personalization algorithm selects the most adequate ads for the user on the basis of the Web content mining and usage mining data by means of classification and clustering techniques.

This section details the corresponding functionality of developed modules as well as the problems that arouse during the implementation.

## 4.1 Web Content Mining

Web content mining extracts useful information and Web knowledge from Web sources or Web contents such as text, image, audio, video and structured records. The eSPIGA system captures, pre-process, cleans and categorizes the text content of the Webpages of the publishers into several predefined categories using some Open Source libraries such as crawler4j (Ganjisaffar, 2012), boilerpipe (Kohlschütter, Fankhauser, & Nejd, 2010) and OpenNLP (Morton, Kottmann, Baldrige, & Bierner, 2005).

A content-targeted system relies on matching ads and their associated keywords to the text of a Webpage. In contrast to content-targeted systems, the eSPIGA system categorizes each Webpage into a category label on the basis of a categorization algorithm which requires previous training of a set of predefined categories. The set of categories used in eSPIGA are defined in Table 1 and have been chosen from the main categories of Google Ads.

One of the main difficulties for the method is the multilingualism of Web contents. In particular, the categorization algorithm needs to be trained in all the languages considered to be analysed. Thus, only two languages (Basque and Spanish) have been included for this pilot.

The Web categorization algorithm has been trained with texts from Wikipedia. Based on its categories and lists, the training process has been automated in order to simplify the inclusion of new languages. 14,730 Wikipedia pages have been considered to train the selected 20 categories in Spanish.

**Table 1** Web content categories considered in eSPIGA

Web content categories						
Sports	Finances	Politics	Travel	Arts	Gastronomy	Animals
Cars and vehicles	House and garden	Health and wellness	Science	Online communities	Jobs and Education	Real state
Software and hardware	Companies and industry	Books and literature	Games	Food and beverages	Internet and communications	

However, as there are not many Wikipedia pages in Basque, news from Basque online media has been used to train the categorization algorithm (14,525 pieces of news from 732 Webpages).

Once categories have been trained, the categorization algorithm creates the probabilistic model that calculates the probabilities of a Webpage belonging to each category based on its content. For this purpose, a maximum entropy probabilistic model is generated for each language using the Open Source module Apache openNLP, which selects the most representative words for each category, assigning a specific weight to its ability to classify a trained category. When the classification model is built, the content of the Webpage of the publisher is classified into the best rated category based on its keywords, main text and language. To automate this process, a specific crawler has been implemented so that all the Webpages of a main URL are obtained and classified once a day.

## ***4.2 Web Usage Mining***

Web usage mining is described as the application of Data Mining techniques on Web access logs to optimize a Website for the preferences of the user, exploring new ways to navigate and perform during a visit to a Website. It is mainly based on the sequential analysis of pages visited during a given session, analysing Web clicks.

The first step of Web usage mining is the acquisition of the HTTP requests and the definition of user sessions, which is a list of URLs requested by the user during a navigation period through the Website of the publisher. Once a new Website is registered, an invocation code is generated. When the invocation code is placed on the main Webpage of the registered Website, a cookie is inserted the first time a user visits the Website. Cookies generate specific identifiers and parameters uniquely linked to individual users. However, this user identification technique has several limitations. Particularly, the assigned cookie is different in each browser for the same user. Furthermore, if the user deletes cookies, user will be considered as a new user.

Moreover, a Web-bug is also inserted to follow the activities of the users in any Webpage where this invocation code is inserted. It is a small file embedded in a Webpage that acts like a “spying agent”. It is a tool used to monitor who is visiting a Website, collecting information about the IP address, the type of Web browser used, the URL of the visited Webpages and the time and duration when the Webpage was viewed. Thus, Web-bugs added to the Website cookie, allow tracking the navigation and actions of a specific user within Websites over time.

Once a customer visits a Webpage with a Web-bug embedded, the eSPIGA server receives a request to check whether it is a new user or not. On the one hand, if the user is a recurrent visitor, he has already a cookie assigned and the corresponding navigation information is sent to the server. On the other hand, if the user has no cookie assigned, a new cookie is generated for such user before his

navigation information is sent to the server. Hence, the internet browsing history of the users are stored in the database. Furthermore, each user session is linked up to the set of ads viewed and clicked by the user during the session.

Finally, though stored and processed data does not comprise private information about the users, the system alerts and notifies users about the use of cookies and the purpose of these cookies on each of the registered Websites.

### 4.3 User Profiling

There are several supervised classification techniques for user profiling. A common approach to develop efficient algorithms includes the following steps: (1) obtaining a reasonable set of training and testing data (i.e. actual users gender and age range as well as their navigation patterns or preferences); (2) generating an appropriate supervised classification model trained with gathered data; (3) testing the classification model; (4) measuring the error; and (5) iteratively improving generated model with the last two steps so as to minimize the error (avoiding overfitting). However, as the proposed approach does not consider any information about registered users, neither real users training nor testing data can be considered. Hence, required training data is obtained from a novel approach based on official statistics about the relation between demographics and the usage of Internet.

Developed approach uses Web content mining and Web usage mining to infer users' preferences and link them with official statistics about the relation between demographics and the usage of Internet in order to assign most likely gender and age range to each user based on his/her preferences. Web content mining added to user Web usage mining allows inferring user preferences from visited Webpages topics. The first step is to store the Webpages visited by the users and the corresponding dates into the database. Then, users' preferences are ranked over time and corresponding gender and age range are inferred.

As no data about gender and age range from real users is known, a novel technique based on probabilistic classifiers has been implemented. The relation between population demographics and the usage preferences of the Internet services has been used as training data for supervised learning algorithms. In this scenario, only one sample representing all the population is available for each of the variables considered in the model. Probabilistic classifiers are used for this type of input data as they are usually useful to make simple but effective approaches.

A probabilistic classifier is a classifier that predicts, given a sample input, a probability distribution over a set of categories, rather than only outputting the most likely category that the sample should belong to. In a common classifier, a category is assigned to a sample by a modelled function, i.e.  $\hat{y} = f(x)$ , being  $x$  a sample and  $\hat{y}$  its assigned category label. This function is fitted using the training dataset  $X$  while the category labels form a finite set  $Y$  defined prior to training. Probabilistic classifiers generalize this notion of classifiers: instead of functions, they consider conditional distributions, i.e.  $\Pr(Y|X)$ , meaning that for a given  $x \in X$ , they assign

probabilities to all  $y \in Y$ , being the sum of these probabilities equal to one. Once these probabilities are known, “hard” classification can be done by the selection of the predicted category as the one with the highest probability.

A Bayesian probabilistic classifier has been used to create a probabilistic model of user preferences that predicts the probability of users belonging to each category by means of the training data. In particular, two probabilistic models have been built. While the first model computes the probability of each user of being male or female, the second model calculates users’ probability of belonging to each of the six age ranges (in years old) considered (16–24, 25–34, 35–44, 45–54, 55–64, 65–74).

Furthermore, Bayesian classifiers can be simplified to a Naïve approximation if model characteristics, e.g. user preferences, can be considered as independent, i.e. the probability of a user to have a specific preference does not depend on other preferences. It can be assumed that the correlation between the 20 selected preferences is not significantly high in this case. Thus, independence among preferences is assumed and Naïve Bayesian classifier is considered.

The Naïve Bayesian classifier defined predicts the profile (gender or age range) of each user by means of the probability that each preference belongs to each category, e.g.  $\Pr(\text{preference for sports}|\text{male})$ . Thus, assuming that the preferences of users are independent, these probabilities can be calculated as shown in Eq. (1).

$$P(C_i | P_{j \in (1,n)}) = \frac{P(C_i) \cdot \prod_{j=1}^n P(P_j | C_i)}{P(P_{j \in (1,n)})} \quad (1)$$

Being  $C_i$  the predicted model category  $i$  with  $i \in (1, 2)$  for gender model and  $i \in (3, 8)$  for age range model; and being  $n$  the number of preferences considered ( $n = 20$ ) and  $P_j$  the user preference  $j$  with  $j \in (1, n)$ . For example, to determine if a specific user tends to be male or female according to his main preferences, e.g. “sports” ( $j = 1$ ) and “house and garden” ( $j = 9$ ), the greatest probability from Eqs. (2) to (3) will be chosen.

$$P(C_{i=1} | P_{j=1}, P_{j=9}) = \frac{P(C_{i=1}) \cdot P(P_{j=1} | C_{i=1}) \cdot P(P_{j=9} | C_{i=1})}{P(P_{j=1}, P_{j=9})} \quad (2)$$

$$P(C_{i=2} | P_{j=1}, P_{j=9}) = \frac{P(C_{i=2}) \cdot P(P_{j=1} | C_{i=2}) \cdot P(P_{j=9} | C_{i=2})}{P(P_{j=1}, P_{j=9})} \quad (3)$$

Due to the consideration that the highest probability is finally chosen, i.e.  $\max\{P(C_1 | P_1, P_9), P(C_2 | P_1, P_9)\}$ , and both probabilities have equal denominator, the later can be neglected in order increase computation efficiency. This process is repeated for each age range. Once these conditional probabilities have been computed, most probable gender and age range are selected, i.e.  $\max\{P(C_i | P_1, P_9) | i \in (1, 2)\}$  and  $\max\{P(C_i | P_1, P_9) | i \in (3, 8)\}$ , respectively.

**Table 2** Comparison table between official statistics of population gender and age range and resulting gender and age range statistics from random user profiles with  $k = 1$  and  $k = 6$  for gender and age range models, respectively

	Gender ( $k = 1$ )		Age range ( $k = 6$ )					
	Male ( $i = 1$ )	Female ( $i = 2$ )	16–24 ( $i = 3$ )	25–34 ( $i = 4$ )	35–44 ( $i = 5$ )	45–54 ( $i = 6$ )	55–64 ( $i = 7$ )	65–74 ( $i = 8$ )
Expected	49.2 %	50.8 %	9.8 %	13.7 %	16.9 %	14.9 %	11.4 %	8.7 %
Obtained	57 %	43 %	3 %	30 %	21 %	29 %	4 %	13 %
MSE	$6.084 \times 10^{-3}$		$1.001333 \times 10^{-2}$					

In order to improve the fitting of actual results with official statistics, the  $k$  most relevant preferences must be defined. The number of user preferences  $k$  to be considered in the probabilistic model is determined by generating random user behaviours and minimizing the difference between official and random users' aggregated statistics. In particular, from the 16 preferences evaluated in the official statistics, 65.536 ( $2^{16}$ ) behaviour combinations were generated with random values.

It is important to avoid considering all ( $k = n$ ) preferences as representative as this consideration leads to the same profile for any user.

Thus, best  $k | k < n$ , must be selected so that user profile depends on the most relevant  $k$  preferences. Thus, the most appropriate  $k$  value was selected by minimizing the Mean Square Error (MSE) between the actual official statistics and the statistics inferred from the set of random profiles generated (Table 2). Obtained results were originated by the use of the most relevant preference ( $k = 1$ ) for gender profiling and the six most relevant preferences ( $k = 6$ ) for age range profiling.

Finally, as a user navigates the Web, his profile must be frequently updated. In particular, a user profile is updated every 10 page views. User profiling (gender and age range) algorithms are coded in R statistical software while other automated functions are developed in Java.

#### 4.4 Advertisement Recommendation

The objective of the eSPIGA system is to maximize the utility of advertising campaigns, which can be defined as the value perceived by the users, representing how much users like each ad. Specific ad utility for each user is measured by a positive value if the user clicks on the ad or negative when there is no click. The recommender system considered to maximize the ads utility is as follows.

Consider  $W$  the set of users and  $A$  the set of ads available. Being  $u$  the utility function that measures the utility of an ad  $a$  perceived by a user  $w$ . The recommendation objective is to measure the ad  $a' \in A$  that maximizes the utility for each user  $w \in W$ :

$$\forall w \in W, \quad a'_w = \underset{a \in A}{\operatorname{argmax}} u(w, a)$$

A hybrid recommendation model has been implemented, combining both the data of similar advertising campaigns (content-based filtering) and the utility of the ads within such campaigns for similar users (collaborative filtering). The hybrid model is executed in cascade. In the first step, appropriate campaigns are pre-selected based on content-based filtering, i.e. a subset of similar campaigns whose target properties fulfil user profile (gender, age range, preferences, location). Once this subset of campaigns is obtained, a collaborative filter is applied to select those ads from the pre-subset of campaigns which utility is higher for the subset of similar users defined.

Hence, the objective of the recommendation system is to serve the most valuable ad for each user, taking into account the utility of the ad within the campaigns that better fit the user and campaign targets.

Finally, some additional customizable filters have been added to the recommendation system in order to reduce user rejection to the ads recommended. For example, the same ad is never shown more than five times to the same user, and an ad that is clicked is not shown again.

## 5 Demonstration of the eSPIGA System

The eSPIGA system has been validated on Travel And Twitts Website ([www.travelandtwitts.com](http://www.travelandtwitts.com) [Sept. 10, 2015]). This Website is a travel blog where the Basque Regional Tourism Organization Basquetour ([www.basquetour.net](http://www.basquetour.net) [Sept. 10, 2015]) wanted to insert some marketing campaigns to promote several tourism activities in the Basque Country (Fig. 2).

The validation process was evaluated as follows. First, Basquetour was registered as a publisher in the eSPIGA system to create advertising campaigns and uploading their corresponding creative elements. Several marketing campaigns

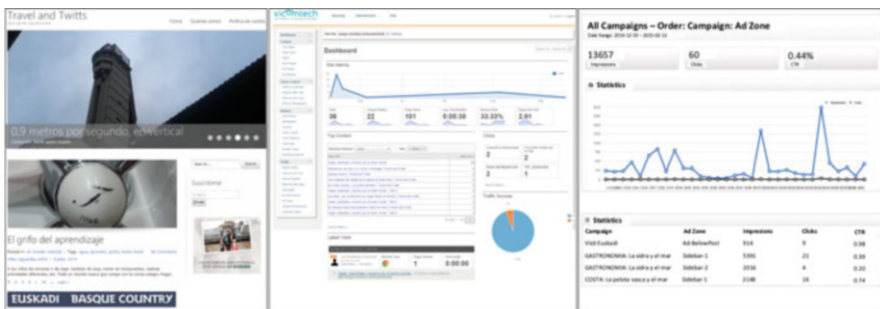


Fig. 2 Travel and Twitts blog and eSPIGAs' analytics and authoring tools

were created related to family, gastronomy or culture events. Each campaign had several creative elements customized for specific user profiles. For instance, while the “Visit Euskadi” campaign was oriented to the general public (it was a general ad about the Basque Country), the remaining campaigns were segmented by age, gender, location and user preferences. Secondly, the administrator of the Travel and Twitts Website registered the main URL of the blog into the eSPIGA system.

Once the Website was registered, all the Webpages of the Website and their contents were processed to assign one category (from the 20 possible) to each Webpage. Note that this process is run each time the classification model is changed. In addition, in order to keep updated the classification of all the Webpages, new pages are daily detected and classified. The validation pilot included three ad zones: two square zones for the right hand menu of  $250 \times 208$  pixels, and one rectangular zone for the bottom end of  $630 \times 90$  pixels. Once the invocation codes have been added to the Website pages, personalized ads are shown to Travel And Twitts Web visitors.

During the 2 months validation process, a 0.44 % Click Through Ratio (CTR) was gained, which represents 4.4 clicks per 1000 visualizations. This CTR may seem too low, but it was higher than expected, as common CTR rates in online advertising campaigns are decreasing steadily (Idemudia, 2014) and usually located between 0.06 % and 0.5 % (Cole, 2008; Luna-Nevarez & Hyman, 2012).

## 6 Conclusions and Further Work

This work presents a novel approach to serve personalized ads to Websites users using their navigation stream. The novel online advertising approach for automatic “persistent personalization” of Web ads is based on Web-mining techniques that combine representative parameters for advertising in a unique platform: the most suitable content of the Website of the advertiser; the probability of the click-through; the advertising targets arising from contracts with advertisers; and fuzzy mechanisms.

Automatic ad personalization is based on user preferences. In particular, online activities and behaviours of the users are diverse enough to characterize different user profiles and preferences, which confirms hypothesis H1. As a user navigates the Web, his navigation activity can be obtained and stored. This information, along with the content analysis of each visited Webpage, serves to determine the major topics of interest of the user (i.e. user preferences), which supports hypothesis H2.

Each Website content is related to its main category. A set of 20 predefined topics were considered. Once user preferences are calculated, presented methodology infers the user gender and age range from his preferences and the relation between demographic and Internet usage surveys and statistics. This last statement serves to confirm hypothesis H3. With the users profiled, a hybrid recommendation system has been proposed to serve ads within the campaigns that better fit the user and other similar users.

Finally, the recommendation system has been successfully validated in a travel blog Website. The implemented prototype made it possible to serve the appropriate ads to the targeted audience on the basis of the classification of user profiles. The obtained CTR (0.44 %) was high compared with common CTR rates in online advertising campaigns, usually located between 0.06 % and 0.5 %.

Future work will be oriented towards most accurate Web content mining techniques based on NLP such as Named Entity Recognition. Such techniques will allow the extraction of additional characteristics to complete the preferences information about the users. Other field of extension is the adaptation of the approaches presented here to mobile applications, where user monitoring is still a challenge.

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## References

- Bae, S. M., Park, S. C., & Ha, S. H. (2003). Fuzzy web ad selector based on web usage mining. *IEEE Intelligent Systems*, 18(6), 62–69.
- Barford, P., Canadi, I., Krushevskaja, D., Ma, Q., & Muthukrishnan, S. (2014). Adscape: Harvesting and analyzing online display ads. *IW3C2*, 597–608.
- Bilenko, M., & Richardson, M. (2011). Predictive client-side profiles for personalized advertising. *Proceedings of the 17th ACM SIGKDD – KDD '11*, 413.
- Bleier, A., & Eisenbeiss, M. (2015). Personalized online advertising effectiveness: The interplay of what, when, and where. *MARKET SCI*, (0).
- Cole, S. (2008). Creative insights on rich media (Tech Rep). *DoubleClick Research*
- Davis, H. (2006). Google advertising tools: Cashing in with adsense. In *Adwords, and the Google APIs*. O'Reilly Media.
- Donnell, K. O., & Cramer, H. (2015). People's perceptions of personalized ads. In *IW3C2* (pp. 1293–1298).
- Ganjisaffar, Y. (2012). Crawler4j–Open Source Web Crawler for Java.
- Goldfarb, A., & Tucker, C. (2011). Rejoinder – Implications of “online display advertising: Targeting and obtrusiveness”. *Marketing Sci*, 30(3), 413–415.
- Idemudia, E. C. (2014). The visual-cognitive model for internet advertising in online market places. *International Journal of Online Marketing*, 4(3), 31–50.
- Kazienko, P., & Adamski, M. (2007). AdROSA-Adaptive personalization of web advertising. *Information Sciences*, 177(11), 2269–2295.
- Kohlschütter, C., Fankhauser, P., & Nejdil, W. (2010). Boilerplate detection using shallow text features. In *WSDM 2010, New York City* (pp. 441–450).
- Luna-Nevarez, C., & Hyman, M. R. (2012). Common practices in destination website design. *Journal of Destination Marketing and Management*, 1(1–2), 94–106.
- Morton, T., Kottmann, J., Baldrige, J., & Bierner, G. (2005). Opennlp: A java-based nlp toolkit
- Rusmevichientong, P., & Williamson, D. P. (2006). An adaptive algorithm for selecting profitable keywords for search-based advertising services. *ACM-EC*, pp. 260–269.
- Schafer, J. B., Konstan, J. A., & Riedl, J. (2001). E-commerce recommendation applications. In *Applications of Data Mining to Electronic Commerce* (pp. 115–153). Springer US.



- Tsang, M. M., Su-Chun, H., & Ting-Peng, L. (2004). Consumer attitudes towards mobile advertising: An empirical study. *International Journal of Electronics and Communications*, 8(3), 65–78.
- Tucker, C. E. (2012). The economics of advertising and privacy. *International Journal of Industrial Organization*, 30(3), 326–329.
- Wang, C., Zhang, P., Choi, R., & Eredita, M. D. (2002). Understanding consumers attitude toward advertising. *AMCIS, 2002*, 1143–1148.
- Watson, C., McCarthy, J., & Rowley, J. (2013). Consumer attitudes towards mobile marketing in the smart phone era. *International Journal of Information Management*, 33(5), 840–849.
- Zanot, E. J. (1984). Public attitudes towards advertising. *International Journal of Advertising*, 3, 3–15.

# Connectivity and the Consequences of Being (Dis)connected

Adrian Tanti and Dimitrios Buhalis

**Abstract** Technology and tourism have worked in tandem for many years. Connectivity is the vehicle that drove the goal of technologically enhanced tourism experiences forward. This study, through an exploratory qualitative research identifies the factors that boost and/or distract travellers from obtaining a connectivity enhanced tourism experience. Four factors can boost and/or distract travellers from being connected: (1) hardware and software, (2) needs and contexts, (3) openness to usage, and (4) supply and provision of connectivity. The research also analyses the positives and/or negative consequences that arise from being connected or disconnected. A Connected/Disconnected Consequences Model illustrates five forms of positive and/or negative consequences: (1) availability, (2) communication, (3) information obtainability, (4) time consumption, and (5) supporting experiences. A better understanding of the role and consequence of connectivity during the trip can enhance traveller experience.

**Keywords** Connectivity • During-trip stage • Disconnection • Selective unplugging • Social Wi-Fi

## 1 Introduction

Visualise a traveller who is embarking on a week holiday. As he makes his way to the airport, he listens to music on *Spotify*, keeps socially updated on *Facebook*, and completes the online check-in for the flight. He boards the flight with a boarding pass that was retrieved on a smartwatch, arrives at the destination, and books a ride with *Uber* to the city centre. After checking-in at the hotel, the visitor chooses and books a restaurant through *TripAdvisor*, and navigates to it using *Google Maps*. Once the food arrives, he captures a photo and uploads it on *Instagram* and *Facebook*, shares his/her location and writes a short insight on *Twitter*, chats on *WhatsApp* and reviews the restaurant on *TripAdvisor*. *Google Now*, suggests a list of attractions in the vicinity that he might want to visit. Once in the recommended attraction, he opens *Periscope* and shares a live stream of the view with people from

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all around the world. All of these activities are possible with current technology and require internet connectivity. Although this, by no means, represents how all travellers use technology, it illustrates functional possibilities that many individuals currently operate. For software and devices that make this picture possible, they all require internet connectivity. The ever-increasing body of work on how information and communication technologies (ICTs) influence travellers during their trip has often focused on how digital media, software, and devices can increase communication, gather information, co-create, and improve experiences (e.g. Buhalis & Amaranggana, 2013; Buhalis & Foerste, 2013, 2015; Lamsfus, Martín, Alzua-Sorzabal, & Torres-Manzanera, 2015; Neuhofer, Buhalis, & Ladkin, 2014, 2015; Wang & Fesenmaier, 2013). On the opposite end of the spectrum, there is also emerging research on the induced experiences and tensions resulting from disconnection or unplugging from technology (e.g. Paris, Berger, Rubin, & Casson, 2015; Pearce & Gretzel, 2012). Connection and disconnection have been studied exclusively in their own respective worlds. Researchers often ignore the fact that travellers have to adjust between the two states of connectivity during their travels rather than be completely connected or disconnected. The influence of technology has primarily been observed solely from a software and/or device point of view (e.g. smartphones and wearable technologies) (e.g. Tussyadiah, 2014; Wang & Fesenmaier, 2013; Wang, Xiang, & Fesenmaier, 2014) but rarely have they specifically concentrated on the main factor that maximises their functionalities: connectivity. This study aims to fill this literature gap by exploring the factors that boost or distract the use of connectivity during a trip and the subsequent consequences of being connected and/or disconnected.

## 2 Theoretical Background

### 2.1 *Connectivity and Technology Enhanced Experiences*

Online communication is increasingly challenging the traditional view where tourists manage to disconnect themselves from their home and move into a potentially rewarding, life-changing or challenging space (Pearce, 2011). This notion of movement between two distant worlds has been substituted with the idea of ‘digital elasticity’ (Pearce, 2011; Pearce & Gretzel, 2012). Contemporary travellers explore the identity and the world of others while remaining electronically connected with their home world (Pearce, 2011; Pearce & Gretzel, 2012). The idea of disconnection whilst travelling has given way to the contemporary travellers’ world where they paradoxically make systematic efforts to keep in touch with friends and family through connectivity (White & White, 2007). Constant connectivity enhance the sense of obligation for travellers to retain the same level of presence, attention, and intimacy with their friends and relatives (Larsen et al. 2007 cited by Hannam, Butler, & Paris, 2014; Pearce & Gretzel, 2012). As a result of increased use of

technology, tasks which were previously fulfilled in the pre-trip and post-trip stages are now being fulfilled during the consumption stage (Wang & Fesenmaier, 2013; Wang et al., 2014). The pre-consumption stage has been shortened as travellers tend to plan less and thus become less rigid and more spontaneous. Travellers are more open to change when an activity becomes unsatisfactory and plan alternatives on the spot. The post-trip consumption has become less necessary since experiences are already being shared live on social networks during the consumption stage (Wang et al., 2014).

Memorable travel experiences increase the likelihood and the variety of content that travellers are willing to publish on social media (Minazzi & Mauri, 2015). As social posts start to become a new form of postcards (Minazzi & Mauri, 2015), the level of friends' engagement with the content uploader can also shape the tourism experience. Kim, Fesenmaier, and Johnson's (2013) research shows a significant relationship between social-media enabled communication and emotion. Tourists can arguably have a more enjoyable and memorable experience if they acquire positive emotional support on social media during their trip. While there are increasingly exciting technological systems to enhance the experience of travellers through technology, one fundamental issue still remains: the ability to connect on the internet efficiently and cost effectively while abroad. Telecommunications and infrastructures are crucial in enabling users to connect online. The cost of connectivity through roaming often dictates users' preference for free Wi-Fi as it offers intermittent high bursts of data retrieval at a low or free cost (Gass & Diot, 2010). Increasingly, the provision of free Wi-Fi is being integrated with social logins (see [www.fusionwifi.com](http://www.fusionwifi.com); [www.purplewifi.net](http://www.purplewifi.net)). This service, termed as Social Wi-Fi, provides users with the ability to seamlessly gain access to connectivity, and also provides valuable social data for organisations. While there is increasing literature on social logins (e.g. Sun et al., 2013; Vapen, Carlsson, Mahanti, & Shahmehri, 2015), there is a significant lack of research on Social Wi-Fi, and especially travellers' perception of this connectivity enabler. The demolition of roaming charges in Europe in June 2017 also will enable travellers to use their data allowance throughout Europe facilitating constant connectivity.

## ***2.2 Disconnection and Unplugging***

The inability to connect online can be either forced on the traveller or it could even be the traveller's own personal decision (Paris et al., 2015). The absence of highly familiar sensory inputs and disconnection creates technology-induced tensions that can potentially evoke both positive and negative feelings (Pearce & Gretzel, 2012). The level of reaction towards being unplugged depends on the original intent of the trip, the perceived need of staying connected and the level of control and choice over the disconnection and there might be marketing potential for disconnection as long as it is the travellers' choice to be unplugged (Paris et al., 2015). If the traveller is originally aware that he/she will be in a dead zone area, or desire to be in a dead

zone area, then the level of anxiety will drop because of the awareness and the preparation which is done beforehand to deal with the eventual disconnection. Induced anxiety from disconnection might be related to the perceived need of staying online, as well as the level of addiction to the internet (Paris et al., 2015). The constant need to check and think about new notifications is often a consequence of smart devices (Harwood, 2014). While it is hard to argue against the convenience that internet brings to modern life, a high proportion of the population have developed an addiction to it (Ko, Yen, Chen, Chen, & Yen, 2005). Addicted users might not only feel higher anxiety or distress than typical travellers because of disconnection, but they might also find their denied mobility as unacceptable (Hannam et al., 2014).

### 3 Methodology

This study employed an exploratory qualitative research by conducting face-to-face semi-structured interviews. The primary research utilised a purposive sample since it represents an effective method for a pre-determined criteria for the selection of participants (Bryman 2008 cited by Neuhofer et al., 2015). The pre-defined criteria required participants to be proficient in technology and have travelled within the last 12 months to recall travel experiences. Sixteen participants were interviewed between 26th of May and 8th of June 2015. Three pilot studies were conducted in the UK prior to executing the final interviews in Malta to minimise ambiguities and confusions in the research. The island of Malta was selected as an ideal location to obtain experiences of international travellers as both locals and tourists have to travel beyond their immediate boundaries to access or leave it, and thus face international enablers and barriers of connectivity. Respondents were recruited through social networks, verbal advertising, and an advert at a local university. The duration of the interviews ranged between 15 and 52 min. Table 1 shows the sample profile of the respondents. Although the participants may seem socio-demographically diverse, the study was not attempting to recruit a representative sample or claiming for generalisability, but to explore the issue of connectivity in a way which is transferable to related contexts (Line, Jain, & Lyons, 2011).

To safeguard the credibility of the findings and interpretation, rigorous and prolonged engagement with the data was conducted through a qualitative thematic approach. The researcher utilised Braun and Clarke's (2006) six phases guide for thematic analysis: (1) Familiarisation with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report.

**Table 1** Sample profile

Number	Pseudonym	Gender	Nationality	Age
1	Tom	Male	Greek	20–29
2	Mary	Female	Maltese	20–29
3	George	Male	Australian	40+
4	Kate	Female	Italian	20–29
5	Jack	Male	Thailand	30–39
6	Sarah	Female	Italian	20–29
7	John	Male	Maltese	30–39
8	Jessica	Female	Chinese	30–39
9	Michael	Male	Taiwanese	20–29
10	Emily	Female	Italian	20–29
11	James	Male	Maltese	20–29
12	Joanne	Female	German	30–39
13	Ryan	Male	Maltese	20–29
14	Victoria	Female	French	20–29
15	Owen	Male	Maltese	20–29
16	Samantha	Female	Austrian	20–29

## 4 Findings

### 4.1 *Factors Influencing an Internet Enhanced Experience*

This study has identified both technological and non-technological reasons that influenced the participants' need for connectivity while travelling. The accumulation of these reasons has been classified in four main factors: (1) Hardware and software, (2) Needs and contexts, (3) Openness to usage and (4) Supply and provision of connectivity. Each of these four main factors has underlying features that can boost or discourage internet enhanced experiences.

**Hardware and Software** The combination of hardware and software enables connectivity to become, to a certain extent, tangible for users. The use of devices and their complimentary software allow users to connect to the internet and make use of resources. The respondents used mobility devices to gain connectivity, and operated a plethora of different software to increase the functionalities of their devices. The speed at which information can be retrieved heavily influences the level of interest in using connectivity to enhance an experience. Users instantly connect online to find information, co-create experiences with friends, relatives and/or suppliers, and consequently become an accompaniment to their trip. While hardware and software enable users to connect, some of their technological deficiencies can at the same time prove to be a barrier for connectivity. Deficiencies included: short battery life, slow and non-intuitive applications or devices. Offline applications were perceived more available, and thus reduced the need for the travellers to find connection. Nonetheless, few applications are able to perform

all of their functionalities while offline and they typically require users to download content prior to utilising them in a destination.

If you have Wi-Fi you can always do something, unless your mobile dies without battery.  
(James)

**Needs and Contexts** Different desires and contexts produce different non-technological factors that can either increase or distract the need to have a connectivity enhanced experience. Effectively the impact of these influences will depend on the traveller's personal characteristics, interests, culture and previous experiences. The respondents highlighted three factors that influence the use of connectivity: travelling party, familiarity of the destination, and purpose of travel. The use of connectivity amplified when respondents were unfamiliar with the destination, travelling alone and/or accommodated the purpose trip (and vice-versa). Familiarity includes factors such as: knowledge of spoken language, previous experiences in the destination, and prior preparation. In case of unfamiliarity, connectivity was a mediator and a tool to become rapidly more familiar with the destination.

Without Wi-Fi you speak with people, you ask people in the street because they can help you, they're like your offline internet, but when you don't speak the language, you don't know the city, so you are just pretty lost. (Emily)

**Openness to Usage** The study has observed three particular voluntary approaches to connectivity: (1) Actively connected, (2) Selective unplugging, and (3) Self-Imposed total disconnection. The first approach, *actively connected*, refers to users who desired to be connected throughout their trip: they desire to keep socially updated, keep up with work developments, co-create their experiences, find tourist details and reviews about particular places. Some respondents even admitted that, during their travels, they often become even more active than usual on social media. This also supports Minazzi and Mauri's (2015) claim that memorable travel experiences can increase the amount and variety of content that travellers' publish on social media.

I don't post photos or status normally, but, when I travel well it's the time to brag you know [laughs] so I quite often upload photo, but that's also for my family, I want to share my experience – like real time experience with my family and friends as well. (Jessica)

The second approach to connectivity, *selective unplugging*, refers to being partially active or inactive. Users, rather than being completely disconnected from the internet, are selective in what and/or when they want to disconnect from. Selective unplugging may be blocking work e-mails from the typical use of connectivity. Moreover, selective unplugging can also refer to restrict online usage to specific time of the day. Selective unplugging becomes an increasingly important approach as travellers start to recognise the side effects of being completely connected online. This stems from a conscious effort to reduce overdependence on technology and to enrich the physical and emotional experience in a destination. As certain functionalities and abilities of connectivity are able to complement the travel experience, travellers still connect at certain moments or for specific features.

Hence, travellers strive to find a balance between connection and disconnection in the type of usage and level of consumption.

When I am on vacation I normally decide not to see any emails, still I search the internet, check the news, log on my Facebook, Twitter, but not emails so that at least I don't see what work is coming for me when I return home" (George); "When I was in a bar, I was looking at places where we could go, and then I just realised, why not just enjoy the moment and I will look up places before sleeping. (James)

The third approach, *self-imposed total disconnection*, refers to users that decide to completely block internet connectivity. This is not referring to dead zone areas where users are unable to connect online because of insufficient infrastructure (Pearce & Gretzel, 2012). On the contrary, it is the travellers' personal choice to avoid internet connection with the aim to fully escape from technology and every day realities.

If I'm travelling, with my backpack then I don't use internet – I don't like using it. There is some point where I really need to be disconnected. (Sarah)

**Provision and Supply of Connectivity** While participants have different options to connectivity during their trip, the ability to connect online remains under the prerogative of the suppliers of connectivity. Provision and supply of connectivity through suitable telecommunications infrastructure (data networks, Wi-Fi) enables users to connect (Neuhof et al., 2015). The availability and cost of connectivity often discourages travellers from obtaining a connectivity-enhanced experience. Preference is often given to free Wi-Fi hotspots even with their limited coverage. Wi-Fi is typically free-to-access and tends to provide faster and more reliable connection than data networks (Gass & Diot, 2010). Participants who used 3G/4G networks during their trips often restricted their usage to essential activities and avoided certain functionalities (e.g. social networking, viewing multimedia) to limit the amount of data downloaded and costs. International mobile information search behaviour is constrained by not only the availability of networks but also the cost of network access (Dewan & Benckendorff, 2013).

Yeah I use Wi-Fi wherever it is: the hotel, hostel or restaurant or coffee shop. I am not trying to use the 3G that I have because it costs money and I don't want to spend money when there is Wi-Fi. (Sarah)

With the proliferation of social network users and the consumers' increasing value for provision of connectivity, it is not surprising that organisations are starting to fuse the two together and offer 'Social Wi-Fi' (see: [www.fusionwifi.com](http://www.fusionwifi.com); [www.purplewifi](http://www.purplewifi)). The term *Social Wi-Fi* integrate social logins with the accessibility and provision of Wi-Fi. Social Wi-Fi provides a convenient way to access connectivity and, provision of connectivity no longer remains a service which is valuable solely for consumers, but it also becomes a product which is equally valuable for suppliers. Permitting users to utilise Wi-Fi through logging in their respective social networks allows organisations to increase engagement with customers and retrieve valuable data. Social Wi-Fi received mixed feedback by the respondents. Social



Wi-Fi was praised for being more convenient as it is faster to connect to and also avoids password fatigue—benefits which are similar to the perceived benefits of social logins on websites (Gafni & Nissim, 2014; Sun et al., 2013). However, users were also concerned about the intrusiveness of these services, as these services retrieve data from their social network accounts and felt privacy invasiveness (Vapen et al., 2015). Privacy concerns on Social Wi-Fi perpetuate over and above the typical social logins concerns because travellers lack knowledge on the operators that provide the Social Wi-Fi service, whilst locals may trust an established brand in the marketplace.

This study identifies four factors that influenced the willingness of the participants to connect to Social Wi-Fi: (1) users’ attitude towards privacy, (2) availability of substitutes, (3) perceived value of connectivity, and (4) perceived reputation of supplier. The stronger perceived value of connectivity and reputation of supplier, the more likely participants were willing to connect to Social Wi-Fi. The stronger the care for privacy and the availability of substitutes, the less likely were respondents to use Social Wi-Fi. Figure 1 presents four main influences that can boost or discourage the need and use of connectivity.

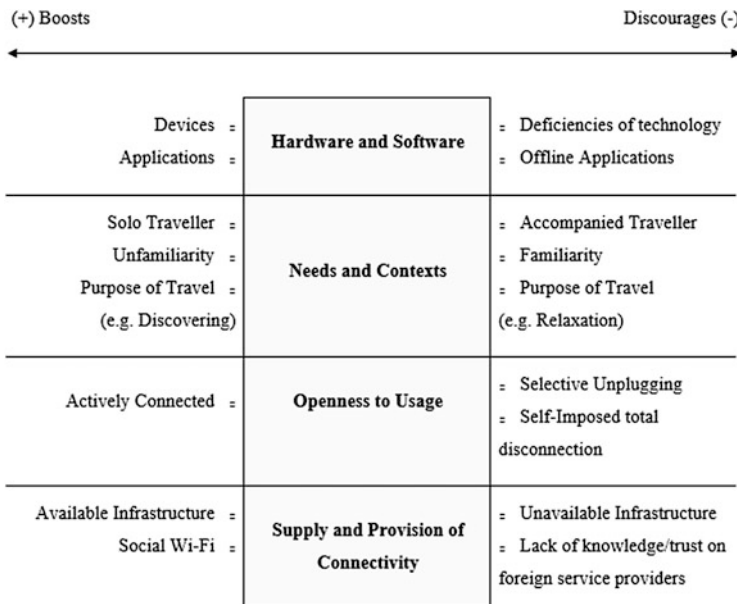


Fig. 1 Factors that boost or discourage use of connectivity

## 4.2 *Consequences of Connection and Disconnection*

The state of being connected or disconnected imposed a number of positive and negative consequences on the respondents. The research classifies five forms of consequences: (1) availability, (2) communication, (3) information obtainability, (4) time consumption, and (5) supporting experiences. In each of these consequences, the research highlights both positive and negative attributes that arise from connection or disconnection.

**Availability** refers to the presence of the traveller in the online and physical world. The ability to connect online provides tourists an opportunity to maintain a link with normal life. This allows them to maintain contact with friends and relatives and work. Being available is important and a relief to some but a hindrance to others: once connected there is an ever-present expectation to maintain regular contact as if the traveller were still at home. This expectation has also manifested itself in a form of addiction where users constantly keep checking for new notifications. The cognitive and behavioural need to constantly check for notification updates is often linked to smart devices (Harwood, 2014). The advantage of being disconnected is that it provided the respondents the chance to truly escape and immerse in a destination. Whether this escape from connectivity was temporal or throughout the whole course of the trip, it gave the travellers unique moments to leave behind the typical thoughts and challenges of their everyday life and immerse themselves in the travel activity or place. Nonetheless, a degree of contact with “home” was still perceived as important.

Ten years ago no one expected you to be available. And now when you don't answer a WhatsApp message within some hours, it's like are you alive? So not sure if this is good or bad. (Samantha)

**Communication** While ‘*availability*’ focuses on the presence and accessibility to converse, ‘*communication*’ refers to face-to-face or text-based conversations. Online connection provides the ability for travellers to communicate on a number of different platforms. Respondents made use of these to share texts, images, videos, experiences—either publicly or with friends and relatives. Connectivity allows relationships and networking to grow and flourish rather than stagnate because of temporal distance. The practice of ‘digital elasticity’ (Pearce, 2011; Pearce & Gretzel, 2012) was a common feature, as respondents remained electronically connected with their home. One potential disadvantage of connectivity is the risk of neglecting people who are surrounding the traveller during his/her trip. This can refer to either the people who are accompanying the traveller, or tour leaders, guides, residents and other travellers. Respondents often admitted that it was far less challenging to get lost on social media than trying to converse with other immediate personnel during the trip. This potential disadvantage of connectivity becomes the positive consequence of disconnection. Without access to online communications tools, travellers needed to become more sociable and thus interacted through face-to-face conversations. The integration with accompanied

travellers, natives or other travellers can provide the tourist a more immersed experience. Respondents have often shown disappointment in facing situations where connectivity managed to replace face-to-face conversations.

We are always with our mobile phones in our hands, it's annoying, because, people are speaking with people that they are not there, and then when they are with those people, they are speaking to us. (Kate)

**Information Obtainability** As tourists continue to plan less before travelling to a destination (Wang et al., 2014) and rely on connectivity to find information at the right time and at the right moment, information obtainability becomes increasingly important. One major positive consequence of an internet enhanced experience is the incredible amount of information. Respondents recalled how during their travels they used their devices to obtain assistance with tourist details, navigation, reviews and instant information. However, one negative consequence is that information can be so vast and detailed that at times it can become overwhelming or has the ability to take away experiences that are otherwise typically enjoyed differently. Disconnection provides a compelling reason to wander around a destination and enjoy experiences that are sometimes made redundant by connectivity. Some respondents argued that unplanned discoveries are perhaps even more rewarding than pre-planned activities. Nonetheless, there are occasions where retrieval of information remains essential. The inability to find swift information is one of the main disadvantage of disconnection. Being disconnected provides limited sources and detail of information. Disconnection and unfamiliarity with a destination is a combination that can induce frustration and even cause stressful moments for travellers when information is needed.

The amount of information that you can get at every moment, every time, in whatever situation. You make the most of the experience, you do not miss anything. . . While when you don't have internet, you are a bit lost, and you wander around. (Emily)

**Time Consumption** Travellers are often constrained with a limited time during their trips. Connection or disconnection can influence the time consumed on performing certain activities. Connectivity can provide efficiency in information search as it offers access to a large database of information and enable travellers to retrieve information swiftly. Online connectivity can also lead to inefficiency and time wastage, when users not only connect to the internet for holiday purposes but also for non-holiday activities: socialising online, keeping up with work, news and so on (Wang et al., 2014). Travellers can potentially end up spending time on the *online* world and neglect the opportunity to discover the *physical* world. The advantage of being disconnected revolves around the idea that time can be exclusively spent on the holiday experience as they are less likely to be distracted if there is no connectivity. Disconnection can also be time consuming when travellers require retrieval of information. Without the assistance of online content, users have to resort to more traditional, time consuming approaches to seek information.

I would be walking like I'm a resident there – like I already know what's happening – so that (connectivity) saved me time. (Ryan)

**Supporting Experiences** The online world is able to support users on information, entertainment, and communication requirements. Connectivity provided the travellers a sense of security in knowing that any needs could be addressed instantly. Minazzi and Mauri (2015) discussed how tourists reduce the perception of risk through the availability of online information and enrich their experiences with instant decisions using mobility devices. This reduces the conventional stress that arises from temporarily living in a different and unknown environment, often with its different culture, language, norms, especially when visiting for the first time. However, this can also become detrimental when travellers over-depend on it, as connectivity can become inconvenient and stressful when it is unavailable. While connectivity has the ability to aid and increase the personal development of travellers, it can also cage the traveller in his/her own online world and miss out on potential learning experiences.

Disconnection can provide travellers with a unique opportunity to be engaged with the present company and place. Disconnection can stimulate (sometimes dormant) skills and be able to enjoy "...dead zone time, space and immediate companions" (Pearce & Gretzel, 2012, p. 12). Nevertheless, respondents felt that lack of connectivity provoked a sense of missed opportunities. Connectivity complements the travel experience as it provides a sense of immediacy and assistance. Following the analysis of the consequences of being (dis)connected, Fig. 2 presents a Connected/Disconnected Consequences Model.

Connected		Consequences	Disconnected	
Positive	Negative		Positive	Negative
Engaged with home	Creates expectation to keep contact	Availability	True escape	Disengaged from home
High online presence	Offline Unsociability	Communication	Offline Sociability	Low online presence
Ample Information	Overload of information	Information Obtainability	Unplanned discoveries	Lack of instant information
Efficiency	Time wasted on non-holiday activities	Time Consumption	Time exclusively spent on holiday	Inefficiency
Additional dimension	Excessive reliance on connectivity	Supporting Experiences	Personal skill development	Missed Opportunities

Fig. 2 Connected/Disconnected Consequences Model

Not necessarily an advantage at time because it might distracts you, however, overall I think it's a plus because it's a service that is available there and you never know what you might need off the internet. (Mary)

The model illustrates how the five forms of consequences can potentially possess positive and/or negative attributes for both connection and disconnection. The consequences of being (dis)connected depend on the level of control over the decision to have connection or disconnection, the openness for usage and the context of the traveller. The positives from being disconnected are amplified if the disconnection is the traveller's own personal decision through blocking access to connectivity or knowingly travelling in unplugged areas. The negatives will intensify if the disconnection was not a personal decision made by the traveller but was imposed on him/her. The negative consequences of both connection and disconnection can be reduced if the traveller is able (and is allowed to) strike a balance between both approaches. Being connected did not necessarily make the participants unsociable or unable to enjoy the immediate presence or companionship. The respondents' degree of control over the use and duration of connection or disconnection played a huge role in augmenting or decreasing the negative consequences. Selective unplugging was often the respondents' preferred attitude towards connectivity in order to strike a balance between the online and offline world.

## 5 Conclusion

This research explores the technological and non-technological issues that influenced the adoption of connectivity during the trip. This research presented findings from a qualitative exploratory research based on a small number of travellers. The results are not generalisable, but explore the consequences of connectivity. A *Connected/Disconnected Consequences Model* identifies the different forms of positive and/or negative consequences of connectivity. The proliferation of Wi-Fi and network connectivity will allow travellers to connect when required to enhance their experience. While Social Wi-Fi can prove to be useful for both the supplier and the traveller, it still has to overcome certain challenges, including willingness to adopt such service. The research identified three different approaches to connectivity: actively connected, selective unplugging and self-imposed total disconnection. Selective unplugging enables travellers to strike a balance on the usage and dependence on the internet and its supporting tools. When it comes to the decision of providing connectivity, marketers have to consider target markets and approach to connectivity and ensure that they are equipped with the right infrastructure. There may be marketing potential for disconnection as travellers seek refuge from their everyday context (Paris et al., 2015). For disconnection to be considered as a competitive advantage, businesses with this approach need to be open about their lack of connectivity infrastructure. The success of

disconnection relies on the travellers' control over the decision to be disconnected. As technology enhanced experiences, co-creation, smart destinations continue to emerge and grow (e.g. Buhalis & Amaranggana, 2013; Buhalis & Foerste, 2015; Neuhofer et al., 2014, 2015), both academics and marketers need to ensure there is the right level of infrastructure. Effectively, destinations and organisations need to ensure their telecommunications infrastructure is capable to address the needs of the market. They also need to ensure that their (technological) goal matches the (experience) goals of their target market.

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## References

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Buhalis, D., & Amaranggana, A. (2013). Smart tourism destinations. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 553–564). London: Springer International Publishing.
- Buhalis, D., & Foerste, M. (2013). SoCoMo marketing for travel and tourism. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 175–185). London: Springer International publishing.
- Buhalis, D., & Foerste, M. (2015). SoCoMo marketing for travel and tourism: Empowering co-creation of value. *Journal of Destination Marketing and Management*. Available from: <http://www.sciencedirect.com/science/article/pii/S2212571X15000207>
- Dewan, I., & Benckendorff, P. (2013). Impact of tech savviness and impulsiveness on the mobile information search behaviour of young travellers. In L. Cantoni & Z. Xiang (Eds.), *Information and communications technologies in tourism 2013 [Online]*. London: Springer.
- Gafni, R., & Nissim, D. (2014). To social login or not login? Exploring factors affecting the decision. *Issues in Informing Science and Information Technology*, 11, 57–72.
- Gass, R., & Diot, C. (2010). An experimental performance comparison of 3G and Wi-Fi. In A. Krishnamurthy & B. Plattner (Eds.), *Passive and active measurement springer passive and active measurement* (pp. 71–80). London: Springer International Publishing.
- Hannam, K., Butler, G., & Paris, C. M. (2014). Developments and key issues in tourism mobilities. *Annals of Tourism Research*, 44(1), 171–185.
- Harwood, J. (2014). Constantly connected – The effects of smart – devices on mental health. *Computers in Human Behavior*, 34, 267–272.
- Kim, J., Fesenmaier, D., & Johnson, S. (2013). The effect of feedback within social media in tourism experiences. In A. Marcus (Ed.), *Design, user experience, and usability. Web, mobile, and product design [Online]* (pp. 212–220). Berlin: Springer.
- Ko, C. H., Yen, J. Y., Chen, C. C., Chen, S. H., & Yen, C. F. (2005). Proposed diagnostic criteria of Internet addiction for adolescents. *The Journal of Nervous and Mental Disease*, 193(11), 728–733.
- Lamsfus, C., Martín, D., Alzua-Sorzabal, A., & Torres-Manzanera, E. (2015). Smart tourism destinations: An extended conception of smart cities focusing on human mobility. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 363–375). London: Springer International Publishing.

- Line, T., Jain, J., & Lyons, G. (2011). The role of ICTs in everyday mobile lives. *Journal of Transport Geography*, 19(6), 1490–1499.
- Minazzi, R., & Mauri, A. (2015). Mobile technologies effects on travel behaviours and experiences: A preliminary analysis. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 507–521). London: Springer International Publishing.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2014). A typology of technology-enhanced tourism experiences. *International Journal of Tourism Research*, 16(4), 340–350.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Technology as a catalyst of change: Enablers and barriers of the tourist experience and their consequences. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 789–802). London: Springer International Publishing.
- Paris, C., Berger, E., Rubin, S., & Casson, M. (2015). Disconnected and unplugged: experiences of technology induced anxieties and tensions while traveling. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 803–816). London: Springer International Publishing.
- Pearce, P. L. (2011). *Tourist behaviour and the contemporary world*. Bristol: Channel View.
- Pearce, P., & Gretzel, U. (2012). Tourism in technology dead zones: Documenting experiential dimensions. *International Journal of Tourism Sciences*, 12(2), 1–20.
- Sun, S. T., Pospisil, E., Muslukhov, I., Dindar, N., Hawkey, K., & Beznosov, K. (2013). Investigating users' perspectives of web single sign-on: Conceptual gaps and acceptance model. *ACM Transactions on Internet Technology*, 13(1), 2.
- Tussyadiah, I. (2014). Expectation of travel experiences with wearable computing devices. In X. Zheng & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 539–552). London: Springer International Publishing.
- Vapen, A., Carlsson, N., Mahanti, A., & Shahmehri, N. (2015). Information sharing and user privacy in the third-party identity management landscape [Online]. In: *Proceedings of the 5th ACM Conference on Data and Application Security and Privacy – CODASPY'15* (pp. 151–153). San Antonio 02–04 March 2015. New York: ACM.
- Wang, D., & Fesenmaier, D. (2013). Transforming the travel experience: The use of smartphones for travel. In: L. Cantoni & Z. Xiang (Phil) (eds.), *Information and communication technologies in tourism 2013* (pp. 58–69). London: Springer.
- Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research*, 48, 11–26.
- White, N. R., & White, P. B. (2007). Home and away. Tourists in a Connected World. *Annals of Tourism Research*, 34(1), 88–104.

# Generation of Gamified Mobile Experiences by DMOs

Ander Garcia, María Teresa Linaza, Aitor Gutierrez, Endika Garcia, and Ivan Ornes

**Abstract** Gamification, which uses game design elements in non-game contexts, has already proved to be successful in different domains. Within the tourism industry it offers several benefits to DMOs, such as encouraging engagement, enhancing experiences, improving loyalty, or increasing brand awareness of tourists. However, examples of DMOs applying gamification for the on-site phase of the trip and validation of its impact on destinations are still lacking. This could be caused due to the scarcity of tools to generate gamified mobile experiences. This paper focuses on these issues presenting hypotheses about the capacity of DMOs to generate these experiences; and the benefits of these experiences for DMOs. To validate these hypotheses, staff from three DMOs have generated gamified mobile experiences with an authoring tool designed and developed to target their needs and technological knowledge level.

**Keywords** Gamification • Mobile experience • Authoring tool • DMO

## 1 Introduction

The concept of gamification is defined as “the use of game design elements and game thinking in a non-game context” (Deterding, Dixon, Khaled, & Nacke, 2011). Gamification should be distinguished from games, as it only uses some of its elements. It has been applied with several objectives, ranging from increasing brand awareness to encouraging consumer engagement.

The tourism industry has already used game elements during all the trip phases (Negruşa, Toader, Sofică, Tutunea, & Rus, 2015), for example, in the frequent flyers programs, or pre-trip marketing campaigns of some destinations, such as Ski Jump from Visit Norway [[www.visitnorway.com/holmenkollen](http://www.visitnorway.com/holmenkollen) (Aug. 23, 2015)], Jet off experience from Geneva [([www.jetofftogeneva.com](http://www.jetofftogeneva.com) (Aug. 23, 2015))] or the

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Serbian Convention Bureau (Kovačević, Zečević, & Veljković, 2014). However, as gamification is a relatively recent concept, only few Destination Management Organizations (DMOs) have developed gamified experiences for the on-site phase of the trip. Although several benefits of gamified experiences have been highlighted (Negruša et al., 2015; Xu, Weber, & Buhalis, 2014), such as the increase in the visiting duration or the balance in the distribution of tourists through the destination, there is a research gap analysing the impact of gamification in tourism, and a lack of user-friendly tools for DMOs to generate gamified mobile experiences.

To address these issues, this paper focuses on the validation of several hypotheses about gamified mobile experiences as tools for DMOs to promote their destinations in the on-site phase of the trip. One of the main challenges is to implement user-friendly tools for DMOs to be able to develop gamified experiences on their own to influence the behaviour of tourists or improve the brand image of the destination.

This paper has been organised as follows. Section 2 reviews the state of the art of gamification, authoring tools to generate gamified mobile experiences, and their application in the tourism domain. Section 3 presents the research objectives. Section 4 describes the authoring tool and Section 5 focuses on the validation on the previous hypotheses. Finally, Section 6 summarises the conclusions and proposes some future work.

## 2 State of the Art

### 2.1 Defining Gamification

The term gamification was defined by Deterding et al. (2011) as “the use of game design elements in non-game contexts”. Thus, gamification is differentiated from related concepts such as serious games (use of full-fledged games in non-game contexts) or pervasive games (extension of games to new environments). Moreover, gamification aims at changing behaviour of users for wanted and desirable activities through extrinsic and intrinsic motivation. The former refers to activities which are only performed in order to achieve some distinct outcome in forms of rewards, while the latter is defined as the performance of an activity for its inherent satisfaction rather than for some separable consequences (Ryan & Deci, 2000).

Five levels of game design elements, which should be considered in gamification, have been defined (Deterding et al., 2011): design patterns related to the interface of the game (badges, leaderboards. . .); patterns and mechanics for game design (time constraints, turns. . .); principles and heuristics for game design (clear goals, game styles. . .); game models (challenge, curiosity. . .); and methods to design the game (play testing, play-centric design. . .).

Although gamification has been applied in several contexts (Hamari, Koivisto, & Sarsa, 2014), this paper focuses on authoring tools to generate gamified mobile experiences and the application of gamification by DMOs.

## 2.2 *Authoring Tools for Gamified Mobile Experiences*

Bulterman and Hardman (1995) define an authoring system as “a program that assists the user in managing the creative task of specifying the placement and relative order of media object events”. Visual tools for multimedia authoring have been developed during the last decades for both programmers and non-programmers. Arndt and Katz (2010) have analysed the main differences among several tools focusing on the target platform; level of expertise assumed of the user; cost and other characteristics.

With the evolution of technology, the complexity of emerging applications such as mobile Apps requires innovative authoring tools for non-expert users, so that they can generate and update their contents. Researchers have proposed different examples of authoring tools to generate mobile games or tourism guides that can be applied to generate gamified mobile tourism experiences. For example, Spadoni, Tariffi, and Sassolini (2011) have implemented an authoring tool to generate cultural mobile tourism applications in urban areas and archaeological sites of the Tuscany Region of Italy based on dynamic contents from documents semantically annotated and indexed by non-technical users. However, this tool does not include gamification elements and the annotation and indexation processes may be cumbersome for most DMOs.

Still focusing on mobile tourism applications, Rodriguez-Sanchez, Martinez-Romo, Borromeo, and Hernandez-Tamames (2013) have proposed the GAT platform to generate mobile wayfinding applications for indoor and outdoor environments. Points Of Interest (POIs) are retrieved from a worldwide tourism database loaded with contents inserted manually or using an automatic Web tourist crawler. Although they successfully validate it with contents about Spanish POIs retrieved from Wikipedia, these applications do not include gamification elements and do not allow including general tourism information or gathering information from tourists.

Within the examples with gamified elements, Kohen-Vacs, Ronen, and Cohen (2012) present an authoring tool for the generation of mobile treasure hunt games, primarily oriented to outdoor learning activities. In these activities, several locations are defined with at least one clue (text, image or Web page) leading to each of them, and with optional tasks attached (quizzes or information to gather). In this example, players cannot select the next location to visit. Moreover, tourism information cannot be included on these games, and there is no mechanism to collect information from tourists.

A more advanced example, oriented to the generation by tourists of city tours based on mobile games to be shared with other tourists as iOS applications, is described by Grüntjens, Groß, Arndt, and Müller (2013). Tours are based on three

types of locations: geo (basic type), story (where tourists have to solve questions defined for each location to follow the tour), and trigger (which enforce to follow a route but do not have any content to be shown to tourists). The authoring tool has been tested with 17 people, being 87.5 % of them able to generate a tour for the city of Koblenz. As this example is oriented to tourists, it does not allow tackling the needs from DMOs.

Following a more general approach, Holm and Laurila (2014) introduce ActionTrack, an authoring tool focused on general location-based games based on four main concepts: different activities (guided walk, interactive story, real-time competition. . .); checkpoints (locations to be reached); guiding and routing elements (clues, maps. . .); and tasks to be performed at checkpoints. Although these games could be useful for DMOs, some of their functionalities are useless for DMOs and they do not have specific options to include tourism information, as they are not designed for the tourism domain. Some commercial products, such as Locatify [locatify.com (Aug. 23, 2015)] or tripventure [sprylab.com (Aug. 23, 2015)], also allow the creation of similar experiences, presenting similar disadvantages.

Previous examples are not specifically targeting gamification requirements from DMOs. They either include functionalities useless to generate gamified mobile tourism experiences by DMOs; ignore gamification elements; do not include tourism information; or do not gather information from tourists. The authoring tool presented in this paper has been personalised with the requirements of DMOs, coping with these issues.

### ***2.3 Gamification Applied to DMOs***

Taking into account the potential benefits of gamification for the service industry, such as tourism, Huotari and Hamari (2012) have redefined gamification as the “process of enhancing a service with affordances for gameful experiences in order to support users’ overall value creation”. As Xu et al. (2014) outlined, there are several examples of the application of game design elements in tourism, but they might not have been recognised or named as gamification.

Analysing the use of full-fledged games in tourism, Xu, Tian, Buhalis, and Weber (2013) identify some insights of the motivation of tourists and DMOs, which could also be applied for gamified tourism experiences. The games to be played on-site should be simple, relaxed and not very challenging, providing useful information about the destination and allowing the interaction with other people.

Focusing on the use of gamification in tourism, Xu et al. (2014) conceptually identify four main potential benefits which could be useful for DMOs, such as encouraging tourist engagement; enhancing tourist experiences; improving tourism loyalty; and increasing tourism brand awareness. Moreover, after a theoretical analysis, Negruşa et al. (2015) also present several potential benefits of gamification not only for DMOs but also for other stakeholders (tourists, tourism

employees and local community) that could improve the economic, social and environmental sustainability of destinations.

Despite these potential benefits, the level of adoption of gamification among DMOs is very limited (Buhalis, Wagner, & Kingdom, 2013). Focusing on the on-site phase of the trip, the first examples were mainly related to gamified location-based marketing applications such as Foursquare (Cramer, Ahmet, Rost, & Holmquist, 2011). A recent study analysing 44 European destinations found that only seven DMOs have mobile applications integrating gamification techniques (Peretta, 2014).

Some real examples include gamified travel tours for urban and rural environments and initiatives such as the Stockholm Sound project promoted by the Visitors Board [[thinkdigital.travel](http://thinkdigital.travel) (Aug. 3 2015)]. This project consists of an innovative travel guide for mobile phones combining music with gamification, geolocation and Augmented Reality elements. A successful example that has evolved over time is the mobile application Epic Mix (Nunes & Mayer, 2014), launched by Vail Resorts in 2010 (USA), and developed to enhance the experience of skiers and snowboarders. It provides interactive maps, integrates social networks and offers badges to tourists as they explore the ski slopes.

However, even if there are studies about the benefits of gamification in different domains (Hamari et al., 2014), and despite the previous potential benefits of gamification in tourism, there is still a research gap about its real impact (Sigala, 2015). Recently, Nunes and Mayer (2014) analyse the acceptance of tourists of a Brazilian nature area of a gamified mobile experience, identifying the potential of such experiences to enhance the visiting experience. Lim, Taylor, and Gallacher (2015) present a gamified application for walkers and bikers to generate benefits for local communities of rural tourism areas, validating its benefits both for tourists, who become aware of local resources, and for local suppliers, who gain a new advertisement channel.

Although previous examples show the potential benefits of gamification for the on-site phase of the trip, more research and best practices are required to better analyse its impact for DMOs. However, in order to have more experiences to validate this impact, DMOs require more tools to generate them, as the one presented in this paper.

### 3 Research Objectives

As highlighted previously, on-site gamified experiences may include several potential benefits for DMOs. However, there are only few examples about tools for DMOs to generate gamified mobile experiences, and about the real impact of these experiences. To address this research gap, this paper focuses on the validation of the following hypotheses:

### **H1: Gamified mobile experiences can be implemented with user-friendly tools by DMOs to promote their destinations**

DMOs, especially small and medium sized ones, heavily depend on technology providers to define and implement ICT-based experiences. This dependency does not allow staff from the DMOs to generate or update the content of experiences themselves, losing control over the associated deadlines, contents and updates. The availability of user-friendly tools may reduce the technology dependence, increasing the available examples of gamified mobile tourism experiences.

### **H2: Gamified mobile experiences are valuable tools for DMOs for the on-site phase of the trip**

These experiences present benefits for DMOs during this phase of the trip. DMOs can provide tourists with more extended information, giving tourists the chance to discover more deeply the destination. Thus, DMOs may influence the behaviour of tourists, such as choosing POIs to visit or the time spent visiting them, and improve their image of the destination.

### **H3: The more game elements included by a gamified mobile experience, the more valuable it is for DMOs**

Gamified experiences can include game design elements of the five levels defined by Deterding et al. (2011). All these elements add value for DMOs when generating the experiences.

## **4 Tools to Generate Gamified Mobile Experiences**

### ***4.1 Requirements of the Authoring Tool***

The main requirement of the authoring tool is to allow DMOs to autonomously generate gamified mobile experiences, avoiding depending on a technology provider. The tool must be easy to use and minimise the efforts required to perform this task.

Moreover, the authoring tool also should have some requirements related to functionalities of the gamified mobile experiences. Firstly, the mobile experiences must be available offline, so that their main functionalities must work without Internet connection. Secondly, the experiences must be multilingual to be available in the more relevant languages for each DMO, and connected to social networks. Thirdly, the experiences must integrate surveys to gain knowledge about tourists by DMOs, and include practical and contact information about the destinations.

### 4.2 Workflow of the Authoring Tool

The workflow of the authoring process has been divided in several steps that will be further explained in the following sections (Fig. 1). The first step of the authoring tool (load) not only allows DMOs generating new experiences, but also loading, previewing and copying existing ones. In the second step (start), the type of experience (basic, advanced. . .), its name and the desired mobile output platforms (iOS, Android. . .) are selected. The third step (design) is related to the customization of the key points of the visual appearance of the graphical interface of the mobile experiences, including primary and secondary colours, and main fonts of the texts (Fig. 2a). The main content of the experience is defined in the fourth step (define), which includes several tasks such as the definition of the categories for POIs (Fig. 2b); the POIs of the experience (Fig. 2c) and the phases which can optionally further group POIs; mini-games which can be attached to POIs and challenges to group those mini-games; rewards obtained by tourists during the experience; and a story which can enforce the order or conditions in which POIs can be visited (Fig. 2d).

Within the fifth step (inform), the DMO can introduce additional information to be shown to tourists or to be gathered from them. Regarding the former, it includes customizable information about the destination (transportation, gastronomy. . .); information from external providers (weather, news. . .); information about the DMO (description, contact information, social networks. . .); and a tutorial about the mobile application. Regarding the latter, a survey to gather information from tourists can be defined (Fig. 2e).

Once all the content has been inserted, the sixth step (translate) is related to the translation of the experience. In order to efficiently cope with multilingualism, the DMOs has to select the languages of the experience (Fig. 2f). Among them, one has to be marked as the main language. During previous steps, data about the

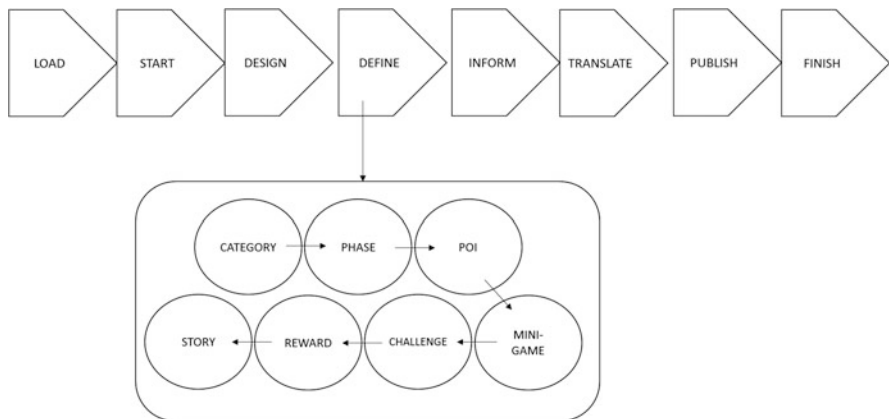


Fig. 1 Workflow of the authoring tool

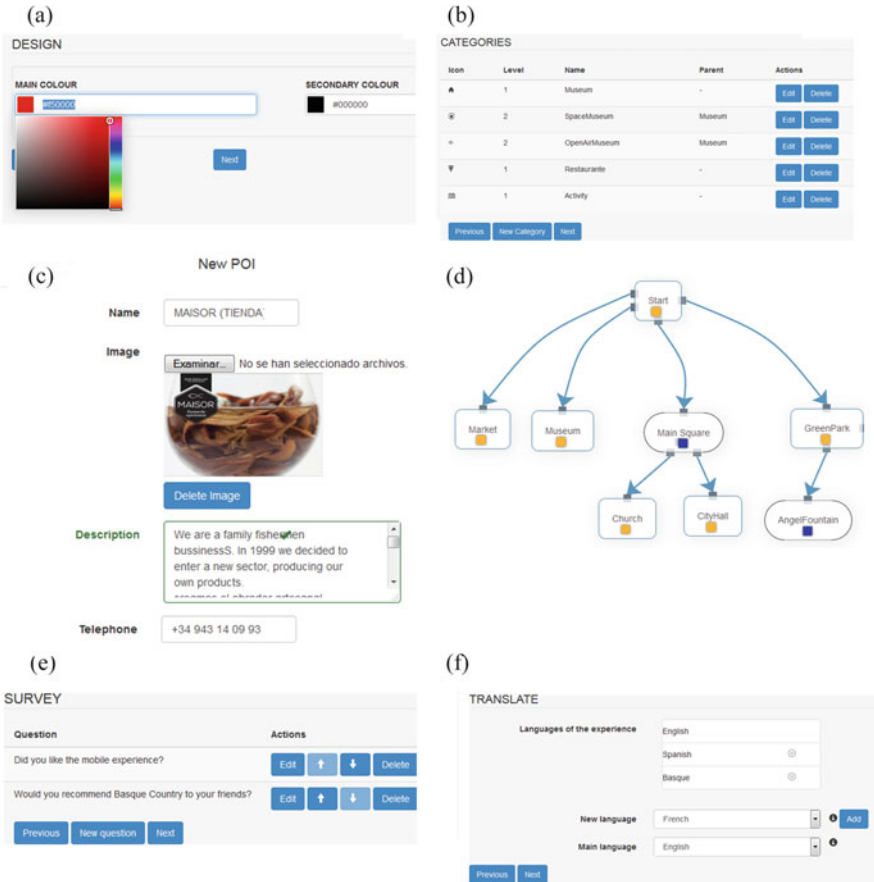


Fig. 2 Screenshots of the authoring tool

experience (names, descriptions. . .) is introduced only in this main language. Then, in this step a CSV file is generated automatically with all the elements to be translated. These elements are mainly texts, but different images and audio files can be defined for each language as well. Once this file has been translated to the rest of the languages of the experience, the DMO can upload the new CSV file to the authoring tool. Translations are automatically persisted and can be generated and uploaded as many times as required.

The final two steps are related to the publication of the generated mobile tourism experience. On the one hand, on the seventh step (publish) the information to be shown on the App stores where the mobile experience is going to be published, such as a description, its category, or the image to represent it, should be defined. On the other hand, although within the eighth step (finish) the mobile experience is automatically generated, it should be manually deployed at the App stores. The deployment has only to be done the first time an experience is published. Each time an

application is launched by a tourist, it automatically checks whether contents of the experience have been updated. Thus, when a new version of an experience is generated, previously installed mobile applications will automatically update their contents.

This general workflow can be adapted to individual needs of each DMO, for example skipping the challenge task when mini-games are not going to be grouped or the design step when both main colours and texts are predefined for a DMO. Different types of experiences can be defined, assigning programmatically to each type a different array that will customize the workflow. Once an experience type is selected, only the steps and tasks included in the array are presented on the authoring tool.

### ***4.3 Architecture of the Authoring Tool***

The authoring tool is a Single Page Web Application based on HTML5, Backbone and Bootstrap. The server is composed of REST services implemented in PHP on the basis of a MySQL relational database. The archetypes of the mobile experiences are based on the Ionic Framework and they are converted to native applications using Apache Cordova. Certain secondary actions of the mobile experiences (surveys, suggestions, codes for collecting prizes) connect to the server to load and save data.

The authoring tool stores all the information related to the experience on the server. Then, during the publication process, auto-contained experiences are generated with their definition (POIs, mini-games. . .) included in a JSON file loaded with the information stored by the authoring tool. For each language of the experience, a JSON file is also generated with the language dependent values. The multimedia files are also bundled with the rest of the experience during this process. Finally, all these files are combined with generic archetypes of hybrid mobile applications. After this process, the final result can be downloaded and transformed into a mobile native application to be manually uploaded to App stores.

## **5 Validation of the User-Friendliness of the Authoring Tool**

The validation of the user-friendliness of the authoring tool has been based on the generation of gamified mobile tourism experiences by the staff from three DMOs, one person from the Regional Basque DMO, Basquetour; and two from Local Tourism Offices (LTO) of sea villages, Getaria and Zarautz in Gipuzkoa (Basque Country).

In order to simplify the evaluation process, three types of gamified experiences have been defined. The first type (basic) is a basic gamified tourism experience where several POIs of the destination, which can be visited in any order, will be



presented to tourists. Mini-games can be linked to these POIs (quizzes, check-in, QR code discovering), while tourists are rewarded once they have achieved them. If the score is above a threshold, tourists win a prize established by the DMO to be collected at its headquarters. Finally, practical information about the destination (weather forecast, transportation. . .) and a short tutorial about the application can also be included.

The second type (advanced) includes more options, such as the possibility of assigning categories to POIs and grouping them into phases. Moreover, mini-games of different POIs can be combined to create challenges to gain more rewards. Furthermore, there are more types of rewards than can be linked to mini-games and challenges, such as badges or extra points. Finally, the third type (professional) allows customizing the order in which POIs have to be visited. Three main options have been defined: POIs can be visited in any order (free mode), in a certain order (navigation mode), or conditionally (conditional mode), where some POIs will be hidden or shown according to the actions of tourists (amount of points, visited POIs, solved mini-games. . .).

The interface of the authoring tool is customized according to each type of experience, hiding some tasks of the definition step: category, phase, challenge and story tasks for basic type; and story task for advanced type.

During the validation session, the staff has been asked to generate a simplified gamified mobile experience (no more than five POIs) for each type of experience using the authoring tool, as the main focus on the validation was related to the workflow and the usability of the Graphical User Interface (GUI) of the authoring tool. After this process, they have been asked questions about gamification related to the hypotheses.

The validation has taken around 45 min for each person. The knowledge level about technology and gamification of the staff participating on the validation was low. None of them knew about the main characteristics or elements of gamification, nor had previously used gamified mobile tourism experiences.

After a short explanation introducing the three types of experiences, the generation of the different elements (POIs, mini-games. . .) caused no major problems to the staff. The workflow was considered very intuitive, and everybody was able to generate a gamified mobile experience of each type. The feedback obtained during this part of the validation confirms the first hypothesis of the paper, when the workflow and the GUI of the authoring tools are tailored to the needs and technological level of the staff. However, the translation process of the experience was not so obvious, with the selection of the main language of the experience and the process to translate and update the content as the main bottlenecks detected. A further more detailed explanation was needed also to implement conditional POIs. All of them agreed on these experiences to be valuable for DMOs, validating the second hypothesis. Firstly, DMOs recognized the capacity of the experiences to influence the behaviour of tourists on the destination. The main changes on the behaviour identified by them were aligned with the ones presented by previous researchers (Negruşa et al., 2015; Xu et al., 2014): increase visiting durations to POIs and balance the distribution of tourists over the destination. Secondly, DMOs

found the experiences could improve the brand image of the destination, increasing the knowledge of tourists about it (history, culture. . .), and offering a better service to niche tourism market (family tourism, active tourism. . .).

Regarding the utility of the different game elements, only basic gamification elements were considered as useful, including scores, simple mini-games, leader boards, progression levels, and rewards. More advanced elements, such as Augmented Reality or mini-games enhancing the information about a POI, were considered less useful. The utility of badges was perceived to have low impact on tourists. Moreover, the generation of stories for an itinerary was perceived useful for closed spaces, but not for their destinations. This feedback rejects the third hypothesis, DMOs found basic gamification elements more valuable. Thus, the inclusion of new gamification elements should be carefully analysed, as it increases the complexity of the authoring process not providing a perceived added-value for DMOs.

## 6 Conclusions

Gamification, defined as the use of game design elements in non-game contexts, has been successfully applied to several domains to change the behaviour of users. However, few examples of DMOs using gamified mobile experiences for the on-site phase of the trip exist. This can be due to DMOs not having the required tools to generate gamified mobile tourism experiences.

To address these issues, several hypotheses have been defined about the capacity of DMOs to generate gamified mobile experiences when they have user-friendly tools available, the benefits these experiences offer to DMOs, and the complexity of the experiences. In order to validate these hypotheses, an authoring tool has been designed and developed based on a customizable workflow and an intuitive GUI.

Staff from three DMOs has taken part on the validation. They have been able to generate three types of experiences (basic, advanced and professional), confirming the first hypothesis of the paper and validating the acceptance and usability of the authoring tool. Moreover, they have also confirmed these experiences being valuable for DMOs (second hypothesis), identifying the main behaviours of tourists that could be influenced, and how these experiences could improve the brand image of the destination. The final hypothesis, linking the number of game elements of the experiences to the value perceived by DMOs, has been rejected on the validation.

Thus, although the application of gamification by DMOs for the on-site phase of the trip is still at an early stage of development, the results of the validation show that there are opportunities to grow both for gamified mobile tourism experiences and for authoring tools empowering DMOs to generate these experiences. Thus, both researchers and industry players are encouraged to further work on these authoring tools tackling the requirements of DMOs; and on gamified mobile experiences providing new services to tourists and allowing DMOs to influence the behaviour of tourists and improving the brand image of the destination.

The main line of future work is related to the validation of gamified mobile experiences generated by DMOs by real tourists. A pilot project devoted to this validation is being defined on the Basque Country. Key indicators of the success of the validation of this pilot will be the opinion of tourists; the number of downloaded experiences; the number of tourists getting enough points to win a prize; the number of POIs visited (globally and per tourist); and the impact and the increase of the number of physical visits to POIs included on the experience. The conclusions obtained in this validation will determine if the gamification pilot is extended to more DMOs of the Basque Country.

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## References

- Arndt, T., & Katz, E. (2010). Visual software tools for multimedia authoring. *Journal of Visual Languages and Computing*, 21(3), 2010.
- Buhalis, D., Wagner, R., & Kingdom, U. (2013). E-destinations: Global best practice in tourism technologies and applications. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism 2013* (pp. 119–130). Austria: Springer.
- Bulterman, D. C. A., & Hardman, L. (1995). Multimedia authoring tools: State of the art and research challenges. In J. van Leeuwen (Ed.), *Computer science today LNCS 1000* (pp. 575–591). Springer.
- Cramer, H., Ahmet, Z., Rost, M., & Holmquist, L. E. (2011). Gamification and location-sharing: Some emerging social conflicts. *CHI Workshop on Gamification* (pp. 1–4).
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining “gamification.” *15th International Academic MindTrek Conference: Envisioning Future Media Environments – MindTrek 2011* (pp. 9–15). ACM.
- Grüntjens, D., Groß, S., Arndt, D., & Müller, S. (2013). Fast authoring for mobile gamebased city tours. *Procedia Computer Science*, 25, 41–51.
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? – A literature review of empirical studies on gamification. *2014 47th Hawaii International Conference on System Sciences* (pp. 3025–3034). IEEE.
- Holm, J., & Laurila, K. (2014). Designing ActionTrack: A state-of-the-art authoring tool for location-based games and other activities. *18th International Conference on Information Visualisation (IV)* (pp. 402–407). Paris.
- Huotari, K., & Hamari, J. (2012). Defining gamification – A service marketing perspective. *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 17–22).
- Kohen-Vacs, D., Ronen, M., & Cohen, S. (2012). Mobile treasure hunt games for outdoor learning. *Bulletin of the IEEE Technical Committee on Learning Technology*, 14(4), 24–26.
- Kovačević, I., Zečević, B., & Veljković, S. (2014). “Gamification” concept: Theoretical framework and destination marketing management practice. *Ekonomika preduzeća*.
- Lim, M. Y., Taylor, N. K., & Gallacher, S. M. (2015). SUMMIT: Supporting rural tourism with motivational intelligent technologies. In C. B. Westphall, J. L. Mauri, & P. Pochec (Eds.),

- UBICOMM 2015 : The Ninth International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies* (pp. 64–69). Nice, France
- Negrușă, A., Toader, V., Sofică, A., Tutunea, M., & Rus, R. (2015). Exploring gamification techniques and applications for sustainable tourism. *Sustainability*, 7(8), 11160–11189.
- Nunes, M. D. O., & Mayer, V. F. (2014). Mobile technology, games and nature areas: The tourist perspective. *Tourism and Management Studies*, 10(1), 53–58.
- Peretta, R. (2014). Evaluating mobile applications for urban tourism. *Journal of Tourism, Culture and Territorial Development*, 1, 13–35.
- Rodriguez-Sanchez, M. C., Martinez-Romo, J., Borromeo, S., & Hernandez-Tamames, J. A. (2013). GAT: Platform for automatic context-aware mobile services for m-tourism. *Expert Systems with Applications*, 40(10), 4154–4163.
- Ryan, R., & Deci, E. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54–67.
- Sigala, M. (2015). The application and impact of gamification funware on trip planning and experiences: the case of TripAdvisor's funware. *Electronic Markets*, 25(3), 189–209.
- Spadoni, F., Tariffi, F., & Sassolini, E. (2011). SMARTCITY: Innovative technologies for customized and dynamic multimedia content production for Tourism applications.
- Xu, F., Tian, F., Buhalis, D., & Weber, J. (2013). Marketing tourism via electronic games: Understanding the motivation of tourist players. *5th International Conference on Games and Virtual Worlds for Serious Applications, VS-GAMES 2013*.
- Xu, F., Weber, J., & Buhalis, D. (2014). Gamification in Tourism. In *Information and Communication Technologies in Tourism 2014* (pp. 525–537). Springer International Publishing.

# Automated Hyperlink Text Analysis of City Websites: Projected Image Representation on the Web

Christian Weismayer, Ilona Pezenka, and Wilhelm Loibl

**Abstract** The objective of this study is to identify the image representations of 75 European cities on the Web. As an effective image positioning strategy this will result in successful differentiation from competitors, given that it is crucial for tourism destinations to regularly examine their image. This study focuses on the supply side of destination-image formation and is therefore concerned with analysing the projected destination image. Hyperlink texts of DMO websites were collected automatically by a crawler. The texts were then edited and filtered. Latent semantic dimensions were generated by applying PCA. A hierarchical cluster approach revealed different groups of hyperlink terms. Finally, the co-occurrence of terms and cities was displayed in a joint map indicating which groups of hyperlink terms are over- or underrepresented for each city. This information permits drawing conclusions regarding the projected images of cities.

**Keywords** Projected image • City website • Crawler • Text mining • Latent semantic

## 1 Introduction

The ITB World Travel Trends Report, 2014/2015 declares that city trips are a boom market segment within the travel industry. Worldwide city trips have increased by 58 % over 5 years to reach 20 % of market share, whereas sun and beach holidays have grown by 18 % and touring holidays by 32 % in the same period. According to

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World Travel Monitor<sup>®</sup>, “this dynamic growth has been supported by the increase in low-cost flights and expansion of budget accommodation” (ITB World Travel Trends Report, 2014/2015).

The growth in urban tourism results in increased competition between tourist city destinations. Since image is considered to be a crucial factor in tourists’ destination choices (Crompton & Ankomah, 1993; Gartner, 1989; Goodall, 1988; Moutinho, 1987), city marketers are required to gain a thorough understanding of their own and competing images in order to be able to promote their products and services more effectively (Baloglu & Brinberg, 1997). Some researchers have demonstrated the importance of travel information in the image formation process (Baloglu, 1999; Baloglu & McCleary, 1999; Beerli & Martín, 2004; Fakeye & Crompton, 1991; Gartner, 1993). Hence it is essential to investigate the sources of information as well as the content presented via these sources. Today, the importance of websites as a source of information prior to a visit is evident (Beirne & Curry, 1999; Wang & Fesenmaier, 2004; Xiang, Gretzel, & Fesenmaier, 2009). However, there are only a few studies on the Internet focusing on the semantic representation of tourism (Choi, Lehto, & Morrison, 2007; Govers & Go, 2004; Mazanec, 2010; Stepchenkova & Morrison, 2006; Xiang et al., 2009).

Therefore, this study puts emphasis on analysing the website content of destination marketing organisations (DMOs) in order to gain insights into the images projected by European cities. Website link text is subjected to an automated search and a subsequent positioning of respective cities.

The underlying hypothesis posits that link denotations refer to website content and therefore permit indications in terms of the image positioning strategy intended by DMOs. The study demonstrates that cities can be positioned according to their link denotations and thus follows a supply-side approach in the context of analysing destination images.

## 2 Literature Review

### 2.1 *Destination Image*

For the purpose of identifying a destination’s competitive market position, the concept of destination image is crucial. Destination image has become one of the most extensively researched domains in tourism studies, resulting in a rich body of literature. This is because past research has demonstrated that destination image has a substantial influence on travellers’ behaviour (e.g. Baloglu & McCleary, 1999; Bigné, Sanchez, & Sanchez, 2001; Gartner, 1989; Gunn, 1972; Hunt, 1975). In addition, image has been shown to be a vital factor in differentiating tourist destinations (Baloglu & Brinberg, 1997). Creating a positive and accurate image is therefore a key factor for a city’s success as a tourism destination.

More recent destination marketing literature differentiates between the image projected by marketers and that perceived by tourists. The former is a combination of the messages and impressions created about a place, while the latter is formed by the interaction between these messages and travellers' needs, motivations, knowledge, experiences and other personal characteristics (Bramwell & Rawding, 1996). In a way, the image projected corresponds to Gunn's (1972) induced image. Gunn (1972) was one of the first to describe the process of destination image formation and distinguishes between organic and induced image. While the organic image is formed as a result of general, non-tourism-specific information, the induced image is influenced by the marketing activities of tourism organizations and agencies. This modified induced image is connected to actual visits to the destination and can be changed by repeat visits. Phelps (1986) differentiates between primary and secondary images. Primary images are developed through visiting, whereas secondary images rely on external information sources, such as brochures, guide books and/or recommendations by relatives and friends. In a sense, Phelps combines Gunn's two types of image formation into one (Gartner, 1993). Several authors (Chon, 1990; Echtner & Ritchie, 1991; Phelps, 1986) emphasise that the primary image tends to be more rational and complex and hence differs from the secondary one.

Gartner (1993), building on the work of Gunn (1972), portrays the process of destination image formation as a continuum of separate agents acting independently, or in combination, to create a destination image unique to the respective destination. He argues that these information agents differ in degree of their control by destination promoters as well as in their credibility to the target market. Gartner (1993) claims that these information agents affect the image formation process in a different way. Therefore, each agent offers certain advantages and disadvantages in terms of cost, market penetration and credibility. That is why destination promoters should also use them in some combination in order to create a unique destination image.

Stabler (1990) argues that consumers' tourist images are influenced by demand factors (tourist) and supply factors (destination). This approach follows the rationale of Dann (1977). This author invented the terms push and pull factors. Push factors encourage tourists to travel to a destination (intrinsic desire), whereas pull factors are those attributes of a destination that attract them towards it (external forces). Destination image, therefore, is a reflection of pull factors. Considering the variety of image concepts, one cannot speak of image per se; rather, one should follow the steps of the decision-making process. The work of most of the aforementioned authors appeared long time before the widespread use of the Internet. Thus, most of these studies do not consider the effects of websites as a source of travel information for image formation. More recently, several authors have been exploring these relationships.

## 2.2 *Travel Websites*

Research on the effects of travel websites has primarily focused on website evaluations (for a detailed review see Buhalis & Law, 2008). Only a few studies deal with website information or content and their influence on destination image (Gretzel, Yuan, & Fesenmaier, 2000; Jeong, Holland, Jun, & Gibson, 2012; Kaplanidou & Vogt, 2006).

For instance, the study by Jeong et al. (2012) reveals that travel website information significantly influences the majority of cognitive and overall destination images. Therefore the authors suggest that “DMOs need to continuously consider the design and content of their official travel websites” (Jeong et al., 2012, p. 25). Kaplanidou and Vogt (2006) focus on customer perspectives of website evaluations. Their study is based on the theoretical framework of the TAM. The structural relationships between website navigation, content and accessibility, user characteristics, website usefulness and intention to travel were explored. As a result, they concluded that content is the most important website characteristic. Thus, travellers look for information about destination features, such as events and attractions, and detailed trip planning support (deals and packages). In other words, DMOs should focus on providing useful information and avoid useless content. Frías, Rodríguez, and Castaneda (2008) explored the effects of information overload in connection with website information. They found that very involved tourists with little Internet experience tend to suffer from information overload. Therefore, the image of a destination is worse when tourists use a travel agency and the Internet together than when they only consult an agency.

In spite of studies indicating the importance of website content in the course of tourists’ decision-making processes, the content itself has not been further explored. The majority of studies dealing with travel website information focus on the customer perspective or demand side. Yet, Tasci and Gartner (2007) claim that more case studies explore the supply side of the image formation process.

## 2.3 *Projected Destination Image on the Web*

So far, literature analysis indicates that perceived image receives much more attention than projected image in research. Only a handful of authors follow such a supply-side oriented approach.

For instance, Govers and Go (2004) analysed the content of twenty Dubai-related websites, including photographic material and text. They found discrepancies in the image projected of Dubai depending on the type of organization—public versus private forms. While DMOs focus on culture and heritage, private sector organisations primarily promote specific facilities and activities and are consequently more product-oriented. Content analysis was conducted manually. Choi et al. (2007) also found a supply-side approach when analysing a variety of online



tourist information sources, including user-generated content such as travel blogs. They identified variations among the different sources and explain them by different objectives and target audiences. For their content analyses they used the CATPAC content analyser. Mazanec (2010) examined the co-occurrence frequencies of connotative nouns and tourism-receiving country names. His study focuses on the supply side of tourism as he explored the image projected on the Web using automated Web queries. The tourism-receiving countries were positioned in a common space according to their connotations conveying positive emotions. Xiang et al. (2009) explored the semantic structure of tourist information provided by the industry (supply side) and compared it with user queries (demand side). The authors used predefined keywords in combination with destination names for their queries. The content of the resulting URLs was analysed. On the other hand, they extracted user-generated log-files from search engines to cover the demand side. They found many mismatches between the two perspectives. As for content, Stepchenkova and Morrison (2006) analysed tour operators' websites about Russia. For automated content analysis they used CATPAC and WORDER. They found that US and Russian sites depicted different images of Russia as a tourist destination.

The study to hand will complement this stream of research and take it further as it analyses the content of the hyperlink text of DMO websites in order to explore cities' projected image.

## 3 Methodology

### 3.1 Data Collection and Description

A pre-selection of 75 European city websites was defined in advance. The cities were selected according to their touristic impact, which is defined by the number of bed nights in excess of one million in 2006. Additionally, Bucharest, Luxemburg, Reykjavik and Sofia were selected as they are capital cities. The aim was to get new insights into the content of hyperlink text and its representation on city websites. A Web crawler<sup>1</sup> used the resulting list of city website URLs as seeds. In July 2015, it browsed the 75 cities' websites and collected all the hyperlink text website users see before clicking on a link pointing to some sub-web page of the same city's website. From these link elements the text visible to human users was extracted. According to Brin and Page (2012) these link texts provide a very accurate description of web pages.

In total, 498,633 phrases of text information were used. The resulting text corpus was imported into the *R* environment for statistical computing (R Development Core Team, 2005). Hyperlink text does not capture full sentences, at most it consists

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<sup>1</sup> See <http://tourismware.com/software/spyglass/javadoc/> for the documentation.

of short phrases, and so the whole text was split up into single terms. No information regarding the tagging of terms, along with their parts of speech (POS), was lost. Upper-case characters were transformed into lower-case ones and numbers were removed, as well as XML tags, such as elements, attributes and some special characters, by making use of the *R* packages *lsa* (Wild, 2015a) and *tm* (Feinerer & Hornik, 2015a). No content was revealed for Madeira which was deleted. The number of different terms contained in a single unadjusted city corpus ranges from 13 (Cascais) to 1834 (Innsbruck). The 143 most prominent terms were revealed by reading in terms that show up in at least one third of the remaining 74 cities.

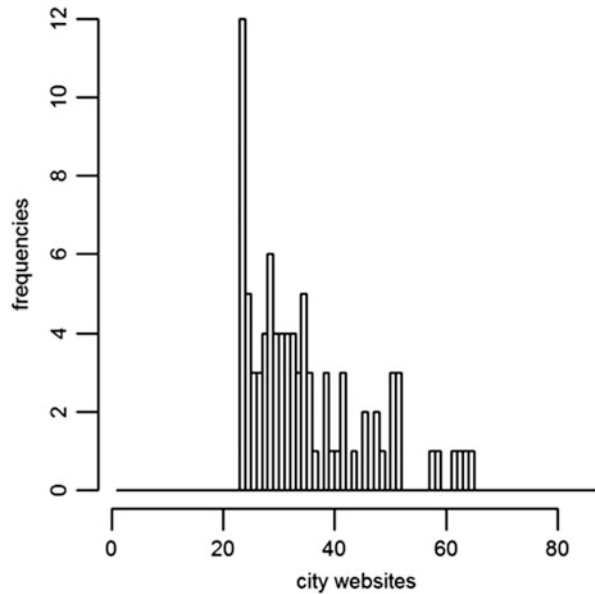
There might be terms that are synonyms of the 143 terms chosen (e.g. American “center” and British “centre”). Transforming synonyms into just one term would increase the term-document overlap. Therefore, *Wordnet* package (Feinerer & Hornik, 2015b) was used to search via the Jawbone Java WordNet API library (Wallace, 2007), offered by Princeton University (2010), for the selected terms. The *ExactMatchFilter* was found not to enhance the reliability as content-wise synonyms sometimes point in different directions. The automatic replacement might distort the results, and manually selecting proper synonyms from the WordNet results would not be worth the effort. Also, the *ContainsFilter* did not offer appropriate solutions (e.g. when searching for ‘car’, such terms as ‘à la carte’ are provided).

Also, *synsets*, terms related to a specific term, did not reveal any useful results, as nearly all of the terms are nouns and, by way of example, the opposites of adjectives fall out of the *synset* logic.

Stemming words was tested using the *Snowball* package (Bouchet-Valat, 2013) containing Porter’s word-stemming algorithm to reduce the complexity of words to their radicals by erasing word suffixes. But unwanted results such as the reduction of ‘parking’ to ‘park’, both in the list of 143 terms, led to usage of the original text. From the separated city.txt-corpora, a term-document matrix was produced with terms in rows and city websites in columns. Cells are filled by the frequency with which each of the 143 terms shows up on each city’s website.

Terms not representing tourist related content were a priori sorted out according to a list of *stopwords*: about, all, amp, and, around, at, best, by, com, de, do, download, en, english, for, from, getting, here, home, how, http, in, international, it, la, legal, more, of, on, open, other, our, see, the, to, top, us, what, where, with, www, you and your. Reducing the number of terms by 43–100 revealed another city without any common hyperlink text, namely Naples, which was deleted too. Thus 73 cities remained. Singular and plural terms (e.g. event and events) or content-wise identical terms (e.g. information and info) were collapsed. These adjustments resulted in a reduction by 13 terms and a final selection of 87 different terms appearing on a minimum of 24 city websites. A minimum appearance constraint on the global frequency of one third resulted in one term (weather) with a minimum appearance on 24 different city websites. The maximum number of websites on which a single term (info) showed up was 65. Figure 1 includes a histogram containing these frequencies.

**Fig. 1** Unique hyperlink term frequencies on city websites

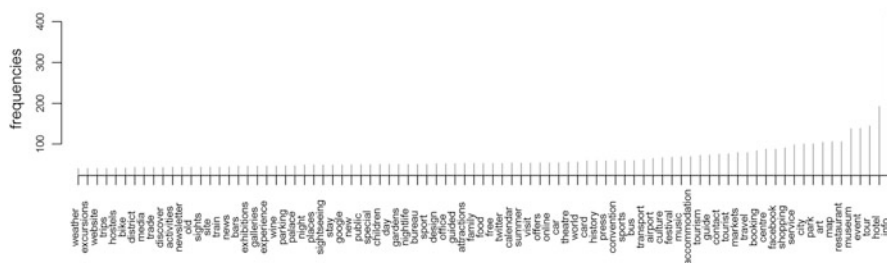


The maximum absolute frequency of a term on all 73 city websites taken together was 456 ('info'). The latter differs from the maximum number of city website appearances, as terms might show up multiple times on a single or on multiple city websites. Frequencies are given in a bar chart in Fig. 2.

Two different weighting options tackling the representation of terms from different perspectives are possible: local and global. The former alters the term frequencies of each single city's website and the latter alters the way in which each single city comes into play when handling the corpora at the website level. Three different local weightings and two different global weightings implemented in the aforementioned *R* packages are in accordance with the thinking behind the data-collection approach.

At the local level, either the frequency of terms is taken into consideration or it is not. If desired, this results in an unmodified text matrix that strengthens the varying appearance frequencies of single terms on different websites. Alternatively, cell frequencies might be transformed into binary values, thus reducing information to the pure fact of whether a term shows up at all or not. The former unmodified one allows for argumentation tackling term strength and its dominance over website content. The latter one eliminates the over- or underrepresentation of terms on a single website. The most frequent term on a single city website showed up 183 times. The minimum gives zero observations. A light version in-between the two takes the logarithms of absolute frequencies and does not stress the dominance of outliers that much.

At the global level, characteristics of whole website corpora are taken into consideration. For websites with many hyperlinks it is more likely that they contain a specific term. But, overall, the detection of certain terms by a tourist is mitigated



**Fig. 2** Overall absolute term frequencies

as this is less likely to happen if they appear on a website next to many other links. It is more difficult to be confronted with a term on a website with a larger website tree compared with a website containing fewer hyperlinks. Correction to achieve a lower weighting for city corpora was done by normalizing cells according to the following rule: “Every cell equals 1 divided by the square root of the document vector length” (Wild, 2015b, p. 23). This corrects cell frequencies according to the overall hyperlink text length of each city’s website corpus and transforms them into a level comparable with other city website corpora. City websites with many hyperlinks are no longer in a dominant position. The website with the most used hyperlink terms is Vilnius, with 402 terms, some of them appearing multiple times. The website with the smallest number of terms is Cascais, with four matches. The second global weighting alternative gives the inverse document frequency, namely “Every cell is 1 plus the logarithm of the number of documents divided by the number of documents where the term appears” (Wild, 2015b, p. 23). This logic “reduces the impact of irrelevant terms and highlights discriminative ones by normalizing each matrix element under consideration of the number of all documents” (Feinerer, Hornik, & Meyer, 2008, p. 52).

## 3.2 Results

All the suggested weightings have their advantages and disadvantages in terms of the desired treatment of the textmatrix. As  $2$  (local)  $\times$   $3$  (global) =  $6$  possible combinations between the above selected local and global weightings have their justification, a rather conservative solution in terms of word frequencies was applied at the local city website level. With the aim of detecting latent semantic dimensions, a binary transformation of observed frequencies was used in the first part of the results chapter. Figure 3 shows squared deviations from a Varimax rotated principal component analysis (PCA), scree plots, of the local binary transformation solution in combination with the two global weightings proposed.

It can be appreciated that global normalization by the document vector lengths extracts one dominant dimension. The aforementioned local weighting in combination with a global weighting, focusing on the discrimination of single terms,

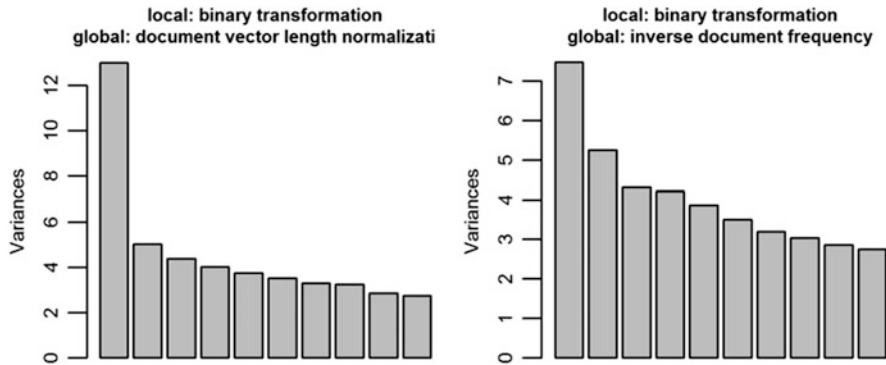


Fig. 3 Variances explained by latent semantic dimensions

extracts much more balanced dimensions in terms of explained variance. The reason for this might lie in the additional power of the less frequent but better discriminating terms that disappear in the course of a normalization approach. Consequently, the latter one, focusing on the discrimination power of single hyperlink terms, is preferred. The location of city corpora in the two-dimensional space, based on the standardized values in Fig. 4, gives a first impression of which latent semantic dimensions each city website's hyperlink content belongs to.

The interpretation of latent dimensions from biplots is quite complex, even if pairs of less dominant dimensions are outlined in several separate plots. Therefore, the latent semantic space will not be interpreted from a continuous level but from a categorical one making use of hierarchical cluster analysis, applying Ward's method. The dendrogram in Fig. 5 distinguishes the various inherent latent dimensions based on hyperlink text connections present in the city websites.

Altogether, hierarchical cluster analysis revealed 21 dimensions with weather and sport representing two single term dimensions. The average number of dimensions per city was 14.34. Thus, a mediocre discrimination between cities based on hyperlink text information can be derived. Several groups of hyperlink terms that can be aligned to some higher source of information and named in an appropriate way are detected (e.g. Online information: google, twitter, facebook; Transportation/infrastructure: bus, airport, parking, car; Going out: district, nightlife, bars, design; Sightseeing: excursions, sights; General information/trip conditions: booking, online, press, guide; Trip planning: day, free, calendar, history; Cultural resources: exhibitions, theatre, wine, website, palace, food, stay, trips, train, discover). Interpretation of some dimensions is challenging as the group of hyperlink terms does not allow for a clear classification to a higher order concept (e.g. card, newsletter, sightseeing, bike). Cutting the tree diagram at a lower stage would result in more specific dimensions afflicted with some narrower content. Some of the dimensions detected correspond with the dimensions found by Serna, Marchiori, Gerrickagoitia, Alzua-Sorzabal, and Cantoni (2015), for instance, infrastructure, trip conditions, natural and cultural resources. The authors used nine dimensions in

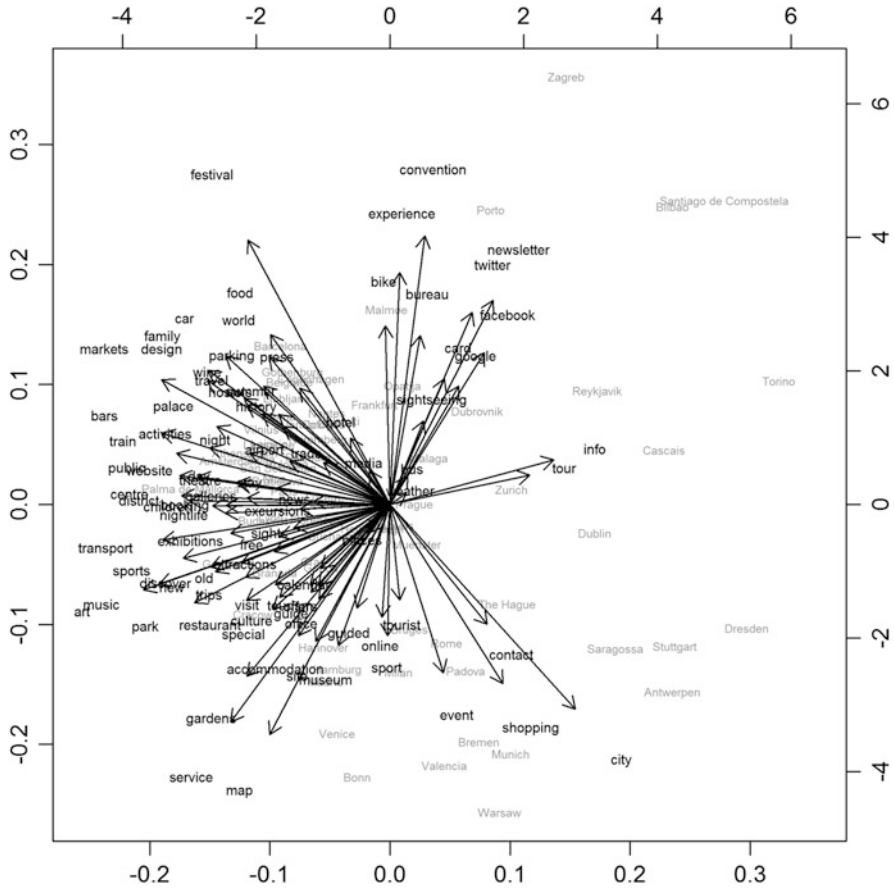
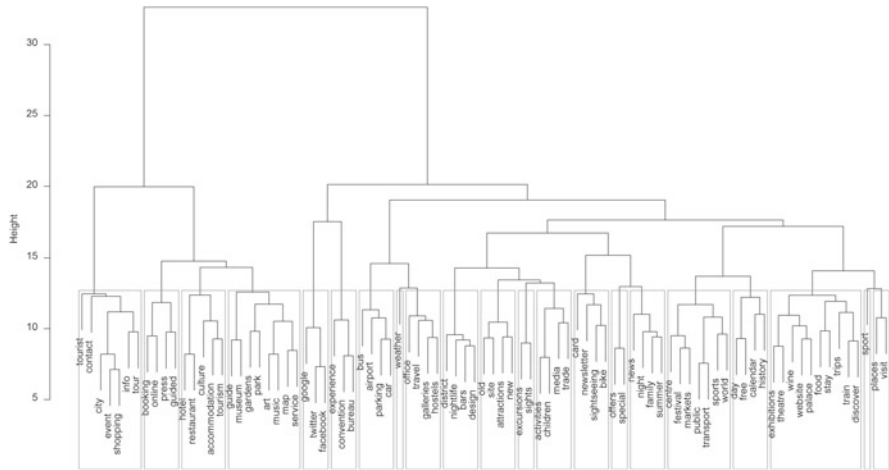


Fig. 4 Latent semantic hyperlink space (terms and city websites)

order to categorise user-generated content. In addition to the cognitive image component, which is referred to as perceptions (e.g. Baloglu & Brinberg, 1997; Crompton, 1979), they also explored the conative or behavioural element of destination image (Dann, 1996; Gartner, 1993; Pike & Ryan, 2004).

As the before mentioned results are based on a dichotomous transformation of the text matrix, no interpretation of the representation strength of single dimensions on each city website is possible but is obtained by analysing the unmodified textmatrix containing the original observed frequencies. Table 1 gives a closing example of two of the aforementioned discriminating term clusters, namely sightseeing and going out, and the different behaviours of two cities, namely, Salzburg and Palma de Mallorca.

Salzburg has an overrepresentation of terms related to sightseeing compared with Palma de Mallorca. Going-out related terms are less represented on the website of Salzburg, yet they seem to be a must on the website of Palma de



**Fig. 5** Hyperlink term dendrogram

**Table 1** Term frequencies exemplified

	Excursions	Sights	Nightlife	District	Design	Bars
Salzburg	2	2	0	0	0	0
Palma de Mallorca	0	2	3	1	1	1

Mallorca. This leads to the conclusion that Salzburg’s DMO is trying to promote the image of a historic place with emphasis on the sights and museums, whereas Palma de Mallorca highlights its nightlife and going-out possibilities.

## 4 Conclusion and Recommendations

As mentioned in the literature review, there are several studies analysing website content. Thus, hyperlink text analysis has also proven to be a promising approach and thus complements the prevalent content analyses of websites. However, only a few studies tackle the images projected by destination managers on the Web. The approach at hand positions cities according to the term frequencies contained in hyperlink texts. The analysed hyperlink text collected by a Web crawler revealed latent semantic dimensions like online information, transportation, going-out, or cultural resources, and indicates that hyperlink text analysis can be regarded as an adequate analytical tool for analysing a destination’s projected image. Furthermore, it exhibits exemplarily how to draw conclusions from the resulting website content.

In addition, this study has practical implications, as hyperlink text analysis provides a quick way of regularly checking the image communicated via websites. DMO managers are advised to be aware of their website content, as it proves to be

one of the most important factors influencing information searches on the Web. Tourism information plays a crucial role in destination image formation and therefore a DMO could present a balanced and deliberated offering of information about its destination. A proportional mix of information on their websites seems to be a reasonable strategy. But in terms of image positioning it can be disadvantageous. Hyperlink text analysis offers an additional way to distance oneself from its competitors if desired.

#### **4.1 Limitations and Further Research**

A limitation of the study is the presumption that hyperlink text, and link denotation, represents website content and therefore permits indications regarding the image positioning strategies pursued by DMOs. In the case that hyperlink denomination is meaningless in terms of allowing conclusions to be drawn about the overall content behind websites, this kind of analysis would distort the perception of the real image of a city presented by its website content. Therefore, it makes no claim to offer a fair interpretation of the cities' online image positioning.

As mentioned in the results section the interpretation of some dimensions is tough because the hyperlink terms do not have any commonalities on the first sight. Categorization could be optimized using adapted ontologies (see Serna et al., 2015).

To test whether this approach is applicable to destinations in general, replication studies should be carried out. Furthermore, a comparison study to verify image aspects—for example an exploration of the demand side—is recommended. However, before fine-tuning the hyperlink text crawler or the analytical steps, first of all the whole textual content of city sub-websites has to be compared with the hyperlink text information to verify the dimensions of the proposed approach.

## **References**

- Baloglu, S. (1999). A path analytic model of visitation intention involving information sources, sociopsychological motivations, and destination image. *Journal of Travel and Tourism Marketing*, 8(3), 81–90.
- Baloglu, S., & Brinberg, D. (1997). Affective images of tourism destination. *Journal of Travel Research*, 35(4), 11–15.
- Baloglu, S., & McCleary, K. W. (1999). A model of destination image formation. *Annals of Tourism Research*, 26(4), 868–897.
- Beerli, A., & Martín, J. D. (2004). Factors influencing destination image. *Annals of Tourism Research*, 31(3), 657–681.
- Beirne, E., & Curry, P. (1999). The impact of the internet on the information search process and tourism decision-making. In D. Buhalis & W. Schertler (Eds.), *Information and communication technologies in tourism*. Wien: Springer.
- Bigné, J., Sanchez, M., & Sanchez, J. (2001). Tourism image, evaluation variables and after purchase behavior: Inter-relationships. *Tourism Management*, 22(6), 607–616.



- Bouchet-Valat, M. (2013). SnowballC: Snowball stemmers based on the C libstemmer UTF-8 library. *R package version 0.5.1*.
- Bramwell, B., & Rawding, L. (1996). Tourism marketing images of industrial cities. *Annals of Tourism Research*, 23(1), 201–221.
- Brin, S., & Page, L. (2012). Reprint of: The anatomy of a large-scale hypertextual web search engine. *Computer Networks*, 56(18), 3825–3833.
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management*, 29(4), 609–623.
- Choi, S., Lehto, X. Y., & Morrison, A. M. (2007). Destination image representation on the web: Contest analysis of Macau travel related websites. *Tourism Management*, 28(1), 118–129.
- Chon, K. (1990). The role of destination image in tourism: A review and discussion. *Tourism Review*, 45(2), 2–9.
- Crompton, J. L. (1979). Motivations for pleasure vacation. *Annals of Tourism Research*, 6(4), 408–424.
- Crompton, J. L., & Ankomah, P. (1993). Choice set propositions in destination decisions. *Annals of Tourism Research*, 20(3), 461–476.
- Dann, G. M. (1977). Anomie, ego-enhancement and tourism. *Annals of Tourism Research*, 4(4), 184–194.
- Dann, G. M. (1996). Tourists' images of a destination—an alternative analysis. *Journal of Travel and Tourism Marketing*, 5(1–2), 41–55.
- Echtner, C. M., & Ritchie, J. B. (1991). The meaning and measurement of destination image. *The Journal of Tourism Studies*, 2(2), 2–12.
- Fakeye, P. C., & Crompton, J. L. (1991). Image difference between prospective, first-time and repeat visitors to the Lower Rio Grande Valley. *Journal of Travel Research*, 30(2), 10–16.
- Feinerer, I. & Hornik, K. (2015a). tm: Text Mining Package. *R package version 0.6-2*.
- Feinerer, I. & Hornik, K. (2015b). Wordnet: WordNet Interface. *R package version 0.1-10*.
- Feinerer, I., Hornik, K., & Meyer, D. (2008). Text mining infrastructure in R. *Journal of Statistical Software*, 25(5), 1–54.
- Frías, D. M., Rodríguez, M. A., & Castaneda, J. A. (2008). Internet vs. travel agencies on pre-visit destination image formation: An information processing view. *Tourism Management*, 29(1), 163–179.
- Gartner, W. (1989). Tourism image: Attribute measurement of state tourism products using multidimensional scaling techniques. *Journal of Travel Research*, 28(2), 16–20.
- Gartner, W. G. (1993). Image formation process. *Journal of Travel and Tourism Marketing*, 2(2/3), 191–215.
- Goodall, B. (1988). How tourists choose holidays. In B. Goodall & G. Ashworth (Eds.), *Marketing in the tourism industry*. London: Routledge.
- Govers, R., & Go, F. M. (2004). Projected destination image online: Website content analysis of pictures and text. *Information Technology and Tourism*, 7(2), 73–89.
- Gretzel, U., Yuan, Y., & Fesenmaier, D. (2000). Preparing for the new economy: Advertising strategies and change in destination marketing organizations. *Journal of Travel Research*, 39(2), 146–156.
- Gunn, C. (1972). *Vacationscape: Designing tourist regions*. New York: Van Nostrand.
- Hunt, J. (1975). Images as factor in tourism development. *Journal of Travel Research*, 13(3), 1–7.
- Jeong, C., Holland, S., Jun, S. H., & Gibson, H. (2012). Enhancing destination image through travel website information. *International Journal of Tourism Research*, 14(1), 16–27.
- Kaplanidou, K., & Vogt, C. (2006). A structural analysis of destination travel intentions as a function of web site features. *Journal of Travel Research*, 45(2), 204–216.
- Law, R., Qi, S., & Buhalis, D. (2010). Progress in tourism management: A review of website evaluation in tourism research. *Tourism Management*, 31(3), 297–313.
- Mazanec, J. A. (2010). Tourism-receiving countries in connotative Google space. *Journal of Travel Research*, 49(4), 501–512.

- Moutinho, L. (1987). Consumer behavior in tourism. *European Journal of Marketing*, 21(10), 3–44.
- Phelps, A. (1986). Holiday destination image – the problem of assessment: an example developed in Menorca. *Tourism Management*, 7(3), 168–180.
- Pike, S., & Ryan, C. (2004). Destination positioning analysis through a comparison of cognitive, affective, and conative perceptions. *Journal of Travel Research*, 42(4), 333–342.
- Princeton University. (2010). About WordNet. Princeton University. Retrieved from <http://wordnet.princeton.edu>
- R Development Core Team. (2005). R: A Language and Environment for Statistical Computing, R Foundation for Statistical Computing, Vienna, available at: [www.R-project.org](http://www.R-project.org) (accessed 16 July 2015).
- Serna, A., Marchiori, E., Gerrikagoitia, J. K., Alzua-Sorzabal, A., & Cantoni, L. (2015). An auto-coding process for testing the cognitive-affective and conative model of destination image. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015*. Cham: Springer.
- Stabler, M. J. (1990). The image of destination regions: Theoretical and empirical aspects. In B. Goodall & G. Ashworth (Eds.), *Marketing in the tourism Industry: The promotion of destination regions*. London: Routledge.
- Stepchenkova, S., & Morrison, A. M. (2006). The destination image of Russia: From the online induced perspective. *Tourism Management*, 27(5), 943–956.
- Tasci, A. D. A., & Gartner, W. C. (2007). Destination image and its functional relationships. *Journal of Travel Research*, 45(4), 413–425.
- Wallace, M. (2007). Jawbone Java WordNet API. Retrieved from <http://mfwallace.googlepages.com/jawbone>
- Wang, Y., & Fesenmaier, D. (2004). Towards understanding members' general participation in and active contribution to an online travel community. *Tourism Management*, 25(6), 709–722.
- Wild, F. (2015a). An Open Source LSA Package for R. R package version 0.73.1.
- Wild, F. (2015b). An Open Source LSA Package for R. Reference manual.
- ITB World Travel Trends Report 2014/2015 (n.d). Retrieved July 25, 2015, from [http://www.it-berlin.de/media/itb/itb\\_dl\\_de/itb\\_itb\\_berlin/itb\\_itb\\_academy/ITB\\_2015\\_WTTR\\_Report\\_A4\\_4.pdf](http://www.it-berlin.de/media/itb/itb_dl_de/itb_itb_berlin/itb_itb_academy/ITB_2015_WTTR_Report_A4_4.pdf)
- Xiang, Z., Gretzel, U., & Fesenmaier, D. (2009). Semantic representation of tourism on the internet. *Journal of Travel Research*, 47(4), 440–453.

# E-Government Relationships Framework in the Tourism Domain. A First Map

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**Abstract** Overlooking the importance of governance features and rapid developments of Information and Communication Technologies (ICTs), surprisingly, there is very little record of academic research on the use of ICTs within destination governance and online communication by tourism governments. This research focuses on the government and policy layer of the tourism domain exploring existing applications, while proposing an Electronic Government (e-Government) framework for the tourism area. The following major stakeholders' interactions were distinguished: Governments to Governments, Governments to Citizens, Governments to Businesses, Governments to Non-profits, Government to Employees, and Governments to Visitors. The proposed framework outlines rules and regulations of ICTs and the tourism industry on regional, national, and international contexts, with cases of ICTs applications for innovating institutional structures and procedures, and ensuring participation in tourism-related governance processes. It provides a common ground for discussing e-Government matters within the tourism domain as well as it outlines future research possibilities.

**Keywords** e-Government • eTourism • Tourism policy • Public governance

## 1 Introduction

ICTs have changed the way in which citizens, companies and governments interact and co-exist. ICTs developments have changed operational and strategic practices of organizations at the global level and have altered the competitiveness of companies and regions globally. The tourism domain is not an exception. ICTs are bringing positive changes and facilitating the tourism visitor experience before,

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during and after the trip, and are changing and enhancing business processes on the marketing, sales and distribution levels. At the same time, new technological developments and their further spread within the tourism domain, such as sharing economy services [e.g. Airbnb [www.airbnb.com](http://www.airbnb.com), Uber [www.uber.com](http://www.uber.com) (Oct. 26, 2015)] have brought up a number of unsolved issues, for instance comparable regulations and taxation, security, safety, as well as waste management. In addition, there are critical concerns related to data privacy, especially with data collected by hotel chains, transportation and telecommunication companies as well as by OTAs.

The tourism domain emphasizes two very critical challenges of (e) Government. On one side, it presents several new cases and business models, which need to be regulated either by applying existing regulations or by developing new ones, particularly related to all those services facilitated by or provided through ICTs. On the other side, it stresses the issue of jurisdiction: while governments rely on given spaces where they have the right to exercise their jurisdiction, digital technologies are ignoring such physical borders (Kulesza, 2015). The above-mentioned issues, along with the use of public goods by private tourism companies; need clear policy practices and regulations, in order to promote a sustainable and harmonious tourism development. In addition to new challenges, and neglecting the increased use of ICTs by Destination Management Organizations (DMOs), responsible bodies for tourism destinations, and other tourism enterprises, a shortage of research and understanding of the development of e-Government practices in the tourism sector has been acknowledged (Gretzel, Fesenmaier, Formica, & O'Leary, 2006; Sigala, 2011; Spyriadis, Buhalis, & Fyall, 2011).

Based on the discussions above, the regulatory and governance cornerstones for the usage of ICTs in tourism related activities should be examined in order to identify problems and challenges to be resolved, best practices to be localized and adopted, as well as to better illustrate the tourism-related issues that might contribute to sustainable development, including environmental, economic, social and cultural sustainability.

The benchmarking and assessment of e-Government applications, as well as the proposal of a framework for such analysis is necessary in order to monitor the performance and progress of the tourism sector, to outline rules and regulations of the ICTs and tourism development on regional, national, and international contexts. Such a framework could assist academics, tourism industry representatives and tourism governance bodies, baffled by the hype of e-Government practices, to create and utilize e-Government initiatives and tools applicable in the tourism domain.

## 2 Literature Review

### 2.1 *Travel and Tourism Industry*

Tourism industry is composed by public and private stakeholders, who are administratively isolated from one another and in several cases might have different and even (partially) conflicting goals. While private companies have corporate perspectives, such as how to increase the number of tourists and generate profit, at the same time they are exploiting public goods, such as green areas, water resources, cultural heritage of the cities, etc. Due to the dynamics of different stakeholders' interests, tourism destinations are very challenging entities to manage. Although the various stakeholders have numerous linkages and interdependencies, cooperation among them is extremely difficult, as stakeholders have different development visions (Padurean, 2010). In that respect, policy is particularly important, and therefore the application of the governance perspective in the tourism domain can be beneficial.

### 2.2 *e-Government*

e-Government is one of the most remarkable notions introduced in the field of public administration in the late 1990s, and initially not “clearly defined and understood among scholars and practitioners of public administration” (Moon, 2002, p. 425).

It refers to the use of ICTs, and in particular, the Internet, by governments and public administrations at all levels to provide digital services to citizens, government employees, businesses and other agencies. E-Government has been defined by OECD as “the use of information and communication technologies, and particularly the Internet, as a tool to achieve better government” (OECD, 2003, p. 23). It is meant to increase effectiveness, efficiency, and transparency of public institutions, as well as to improve relationships with citizens and other stakeholders.

While many authors acknowledge that e-Government applications and services can be mapped according to their complexity and pervasiveness (e.g.: Laynea & Leeb, 2001; Moon, 2002; UN, 2015). Janowski (2015) identifies four many phases of ICTs adoption by public entities, with corresponding goals for each stage (see Table 1).

The latest and most advanced stage, “Policy-Driven Electronic Governance” is not just focused on improving the relationships between government and its constituencies but on improving the conditions of these constituencies by empowering them through “better organization within government and improved relationships with government due to transformative use of technology”. Depending on both location and sector, the stage focuses on considering specific contextual

**Table 1** Digital government evolution (Janowski, 2015, p. 427)

Phases		Context	Goals
Phase 1	Technology in government	Technological	Increasing the quality and efficiency of internal government operations
Phase 2	Electronic government	Organizational	Delivering public services across traditional and electronic channels
			Facilitating administrative and institutional reform in government
Phase 3	Electronic governance	Socio-economic	Engaging citizens and other non-state actors in decision-making processes
Phase 4	Policy-driven electronic governance	Context-specific	Supporting policy and development goals in specific locations and sectors

characteristics and tailoring “its responses to the needs and circumstances of this context in terms of the choice of locally-relevant and/or sector-specific goals, locally-acceptable and sector related -feasible ways of pursuing such goals, and managing the impact of meeting such goals on the local environment and sector involved” (Janowski, 2015, p. 429).

### 2.3 *e-Government in the Tourism Sector*

Tourism and hospitality definitely provide a major application context for Policy-driven Electronic Governance. Already in 2005, a survey done among Americans in order to evaluate citizens interactions and phases of e-Government adoption (Reddick, 2005) showed that getting tourism and recreational information was the most common service obtained by individuals visiting a government web site (77.3 %), followed by doing research for work or school (69.8 %).

Neglecting increasing use of ICTs by managers of tourism destinations, shortage of research and understanding of developing e-Government practices in the tourism sector has been acknowledged (Gretzel et al., 2006; Sigala, 2011; Spyriadis et al., 2011). Furthermore, marketing oriented studies are not taking into consideration “the analysis of the coordination between different hierarchy levels (regional, national and supra-national) of tourism development” (Go & Trunfio, 2011, p. 14). According to Patelis, Petropoulos, Nikolopoulos, Lin, and Assimakopoulos (2005) in spite of the fact that e-Government has enormous potential to improve and advance the interactions between citizens, business and government, the full potential of it in the tourism domain has yet to be determined.

Reviewed literature presents only a few research projects that have explored the use of ICTs for governance related activities within tourism sector.

A case of how ICTs can be related to tourism governance has been proposed by Patelis et al. (2005). They have discussed the importance of tourism online statistical data, as a powerful e-decision support system for tourism demand analysis and forecasting. In their research, a software designed by the Greek National Tourism

Organization for the tourism demand forecasting has been presented. According to Patelis et al. (2005, p. 136), “government is the key holder of the majority of crucial databases in the tourism market, as tourism data is gathered from local governmental organizations and stored using a distributed or central storage scheme”. This data is crucially important for hoteliers, tour operators, transportation players, especially within decision-making processes and accurate forecasts of tourism demand (Wöber, 2003).

Go and Trunfio (2011) looked at the electronic governance services provided by the public and private sectors, while presenting a case study by Trentino (Italian regional DMO) and the way this website is used for a centralized governance approach. The website is being used not only for promotion and marketing of a tourism destination, but also for the reinforcement of the destination brand symbol, “enhancing stakeholders’ relations, and monitoring trends to support strategic decisions” (Go & Trunfio, 2011, p. 16).

Another case of ICTs usage for governmental practices within tourism domain has been proposed by Yang (2010), who has conducted research work on the current state of governmental online applications within local tourism industry in China, while looking at the local tourism information offered by governmental offices.

Sigala and Marinidis (2010, p. 235) have looked at destination management and ICTs from the web 2.0 and e-Democracy perspectives. They believe that “destination management is a collaborative process requiring DMOs to reconcile the diverging interests of various stakeholders and actively involve them in decision and policy making processes. Web 2.0 tools and e-democracy applications empower DMOs to further enhance the role and participation of tourism stakeholders in such collaborative processes”. Moreover, Sigala (2011) has evaluated in her research at how social media are being used for crisis management within tourism domain.

In the research proposed by Adukaite, Gazizova, and Cantoni (2014), the case of 165 National Tourism Offices or Ministries of Tourism is presented. The authors looked at how the latter ones do cover needed information and requirements for foreigners in order to enter the country as tourists. It is argued that such information, its availability, completeness and currency, can help to better serve potential travellers and eventually to enhance a country’s economy and the wellness of its own citizens.

Existing research presents sporadic successful cases, while a holistic approach to the evaluation of existing (e-) Governance processes has still to be undertaken. Indeed, the government and policy levels have recently been indicated by the editorial board of the *Journal of Information Technology & Tourism* (Werthner et al., 2015) as a strategic category for future research issues within eTourism. The following sub-categories were identified as the most critical ones to be looked at by research in the future:

- Sustainability of the tourism ecosystem
- Data privacy issues
- Freedom of movement and personal safety for travellers and tourists

- Self-governance of public bodies, and
- Fairness for all involved tourism stakeholders.

We believe that in order to better define and explore specific issues, researchers, practitioners and policy makers might benefit from a map of the overlapping area between eTourism and e-Government. Such a tool should provide a common framework useful not only to analyse given sub-topics, but also to design and develop suitable Policy-Driven Electronic Governance programmes and initiatives for the tourism and hospitality domain.

After analysing major government stakeholders and the relevance of such stakeholders to the Tourism domain, we propose to study a framework distinguishing six different relationships (1) Government to Government (G2G), (2) Government to Citizens (G2C), (3) Government to Businesses (G2B), (4) Government to Non-profit Organizations (G2N), (5) Government to Visitors (G2V), and (6) Government to Employees (G2E). Such relationships were identified based on several existing frameworks, as presented in the following section.

## 2.4 *e-Government Relationships Framework*

There are six major types of relationships that have been distinguished between governments and their stakeholders, as shown in Table 2. The first category includes other governments and public administration offices, operating within the same country or outside. The second category includes citizens living in the country, region or state. The third category involves businesses that are functioning on the ground where public administration provides regulations. The fourth category involves non-profit and non-government organisations (NGOs). The fifth one features employees of the public administration offices; while the last category

**Table 2** e-Government relationships

e-Government relationship	Description
Government to government (G2G)	Includes interactions with other governments and public administration bodies, operating within the same country or outside
Government to citizens (G2C)	Includes interactions with citizens living in the concerned country, region or other administrative unit
Government to businesses (G2B)	Involves interactions with businesses that are functioning within the jurisdiction of the public administration
Government to non-profits organizations (G2N)	Involves interactions with NGOs and non-profit organizations that are functioning within the jurisdiction of the public administration
Government to employees (G2E)	Features relationships with the employees of the public administration
Government to visitors (G2V)	Involves individuals who are visiting the state, for instance international travelers



involves non-residents, for instance international travellers. All six categories are discussed in details below.

### **2.4.1 Government to Government**

The goal of G2G relationships is to promote collaboration between government agencies, mainly to deliver seamless, one-stop services, and to make more efficient use of whole-of government resources. The interactions between government organizations can take place at different government levels—like national, provincial and local, and between different departments and authorities. To collaborate, government and policy agencies need to provide services to each other, e.g. services enabling information sharing between government agencies (Estevez, Fillotrani, Janowski, & Ojo, 2011). Hiller and Belanger (2001, p. 15) suggest that “there are substantial gains from conducting some of these transactions online”. These relationships can include new forms of record keeping, which help governments to be more interactive, or better deliver services constituency. Such interaction can happen within one country, but also between different states. Cases worth mentioning are sharing of big and open data collected by local governments with national agencies to enhance policy-making, and sharing data between states to ensure safety globally or to provide support to border regulations enforcement.

### **2.4.2 Government to Citizens**

The goal of this relationship is to “establish or maintain a direct relationship with citizens” (Hiller & Belanger, 2001, p. 14) while offering them a variety of ICT-enhanced services in an efficient and economical manner, and strengthen the relationship between government and citizens while benefiting from the use of ICTs. G2C interactions include possibility to exchange instant messages directly with public administrators, electronic votes, possibility to declare taxes online as well as an option of paying city utilities online (online transactions), electronic signatures, name or address changes, renewal of the driving license, etc. As an example, the United States’ official web portal on housing and community [[www.usa.gov/housing](http://www.usa.gov/housing) (Oct. 26, 2015)] provides information and services helping citizens to find and keep a home.

### **2.4.3 Government to Businesses**

Businesses can benefit from several online services offered by governments. The goal of this relationship is to reduce difficulties for businesses to interact with governments—e.g. for registering a new company, for paying taxes, for applying as government provider, etc. while providing them with immediate information and

enabling digital communication. According to Hiller and Belanger (2001, p. 14) “efficiencies can be achieved by reducing paperwork, mailings, and time delays, to name a few. Agencies could also group together (like consumer buying groups) to negotiate better prices”. Important online services that are offered by governments to businesses include: paying taxes online; providing business-relevant information and statistics (e.g. important for forecasting); publishing government regulations through online channels, such as websites and mobile applications. E-tender and e-procurement programs are also becoming one of the fastest growing areas of government-business interactions as they can save time and financial resources for both actors. Another area of government-business interactions is related to government’s role of platform provider, delivering an eco-system to facilitate businesses, as well as other actors, to contribute to the co-creation of public services (Janssen & Estevez, 2011).

#### **2.4.4 Government to Non-profit Organizations**

The rapport between governments and non-profit organizations has been introduced by Fang (2002) as when governments provide information and communication to non-profit organizations, political parties and social organizations, for instance in terms of legislations, or possible financial support and funding.

#### **2.4.5 Government to Employees**

The relationships between public administrations and their employees while using ICTs is similar to the way businesses have relationships with their employees. The goal of these interactions is to offer employees of government offices a range of online tools, sources, and articles that help them maintain communication with the government. For instance, “government agencies can use an intranet to provide information to their employees and can typically allow some online transactions with their employees if they have the proper technological architectures” (Hiller & Belanger, 2001, p. 14.).

Public administrations can maintain online records of personal information of their employees or create shared platform for internal documentation, so to promote paperless interactions. Travel reimbursements forms or new working regulations can also be implemented online.

#### **2.4.6 Government to Visitors**

This relationship addresses interactions between government agencies and visitors to the country, region or city—for instance international visitors or travellers (Estevez, Fillotrani, & Janowski, 2007). G2V services include informational services explaining visitors how to move around in a country. The use of ICTs for visa

application and issuing, for online booking of activities in national parks, or cultural events are also examples of such type of relationship.

### **3 e-Government Relationship Framework in the Tourism Domain**

The six relationships explained in Sect. 2.4 are used as the basis for illustration and analysis of existing e-Government applications delivering services to six main stakeholders within the travel and tourism domain. As a whole, the six type of relationships comprise the proposed e-Government Relationship Framework in the tourism domain. Each of them is explained below.

#### ***3.1 Government to Government***

As previously indicated, this relationship includes communication and collaboration interactions between a government and other public entities, benefiting from ICTs advancements. While the statistical informational services provided by UNWTO [[www2.unwto.org/facts/eng/vision.htm](http://www2.unwto.org/facts/eng/vision.htm) (Oct. 20, 2015)] come immediately to mind, another remarkable example of such G2G services within the tourism domain can be the statistical dashboard provided by the European Travel Commission [[www.etc-dashboard.org](http://www.etc-dashboard.org) (Oct. 20, 2015)], a consortium of 33 European national offices of tourism. This online tool provides tourism statistics and other information relevant to monitor tourism development in Europe and in several selected source markets. The dashboard allows European tourism national and regional governments to have an overview of current trends on traveller's behaviour through constantly updated statistical charts, so this data can be used within decision-making processes and accurate forecasts of tourism demand on the European level.

Another example can be taken from the perspective of a DMO, an institution which manages all involved stakeholders within tourism development. ICTs in this case can be used by National Tourism Offices, to create and provide Destination Management Systems (DMS) for the use of local tourism offices. This allows a centralized approach on information collection and its further provision and dissemination. Switzerland National Tourism Board and its DMS can be such an example (Inversini, Brühlhart, & Cantoni, 2012).

### 3.2 *Government to Citizens*

This type of e-Government relationship presents a communication link between a government agency and individuals living in a county (e.g. citizens and residents). Here the government is working on the provision of information and support to its own citizens while they are travelling abroad. For instance, the Italian Ministry of international relations curates two services for its citizens. The first one—Viaggiare Sicuri [[www.viaggiariesicuri.it](http://www.viaggiariesicuri.it)] (Oct. 22, 2015)], presents information on health, security and safety in tourism destinations around the world, so Italian citizens can access relevant and trusted information before travelling abroad. The second one—Dove Siamo Nel Mondo [[www.dovesiamonelmondo.it](http://www.dovesiamonelmondo.it)] (Oct. 20, 2015)], requires proactive action of citizens to inform the government about their travel plans before they go to potentially dangerous destinations, so that, in case of a crisis, the concerned embassy can be more effective and efficient in retracing and assisting Italian citizens.

On the other site, governments can crowd source from their citizen new tourism development ideas for the city or the country, as in Vancouver, Canada [[www.vancouver.ca/green-vancouver/greenest-city-action.aspx](http://www.vancouver.ca/green-vancouver/greenest-city-action.aspx)] (Oct. 20, 2015)].

### 3.3 *Government to Businesses*

This level of relationship analyses interactions between a public administration and the private companies that operate within its jurisdiction.

Within the tourism industry, ICTs are already being used by governments mainly for the provision of online updated information to companies working in the sector, as well as for the delivery of other general online services e.g.: taxation, authorization. At the same time, governments can offer shared platforms for eCommerce; for instance, for online sales of national hotel rooms, as Switzerland National Tourism Board [[www.myswitzerland.com](http://www.myswitzerland.com)] (Oct. 20, 2015)] or Japan National Tourism Organization [[www.jnto.go.jp/eng/arrange/accomodations](http://www.jnto.go.jp/eng/arrange/accomodations)] (Oct. 20, 2015)] are already doing. On the other hand, several DMOs globally are taking the responsibility of providing online education and training to the businesses working in the tourism sector. Starting from online training activities for national and international travel trade on how to sell a country or region as a tourism destination [[www.elearning4tourism.com](http://www.elearning4tourism.com)] (Sept. 05, 2015)], currently provided by more than 75 national DMOs (Kalbaska, 2012); or provision of online training courses for hospitality businesses on how to boost accessible tourism [Scotland Tourism Office—[www.visitscotland.org](http://www.visitscotland.org)] (Sept. 08, 2015)].

### ***3.4 Government to Non-profit Organizations***

Current type of relationship includes collaboration activities between governments and non-profit organizations. Within tourism domain the role of National Science Agencies, which do support research and development activities of tourism related projects, shouldn't be underestimated. An example of the Swiss National Science Foundation [[www.snf.ch](http://www.snf.ch) (Sept. 05, 2015)] can be mentioned as it provides funding for research within the tourism domain. On the other hand, development agencies [e.g.: USAID—[www.usaid.gov](http://www.usaid.gov) (Oct. 23, 2015)] are providing supports for NGOs interested in managing tourism-related projects.

### ***3.5 Government to Employees***

This type of relationship includes collaboration activities by using ICTs between a government agency and its employees. Tourism sector is not an exception, here also intranets, online communication tools and online records of personal information of the workers can be employed. Below, two cases are illustrated. The first example comprises corporate eLearning courses (Cantoni, Kalbaska, & Inversini, 2009), which can be used by the tourism governments or ministries of tourism in order to provide online training and education to their employees. Employees who are already working for the national or local tourism governments can be trained, for instance on new regulations. Another example is the online training platform offered by the Technology Integration Division (USA) [[www.fieldsupport.dliflc.edu](http://www.fieldsupport.dliflc.edu) (Sept. 05, 2015)]. It has been launched in order to prepare government officers for intercultural encounters. These training series aim at promoting cultural awareness and raising understanding of the people and social customs inherent to various nations and at providing language support for government employees.

### ***3.6 Government to Visitors***

Government to Visitors relationships involve delivering services through the use of ICTs to individuals who are going to visit or are actually visiting the state or city, for instance international travellers. Technological innovations have been exploited extensively in this domain, especially through the provision of information online and digital marketing to prospects/tourists. National, regional and local tourism portals are used, along with mobile apps and online campaigns. An example of such campaign can be Your Singapore [[www.yoursingapore.com](http://www.yoursingapore.com) (Sept. 05, 2015)].

Another way of using ICTs by governments in order to enhance the experience of visitors to the country is the provision of visa information and e-visa initiatives, for instance in India [[www.indianvisaonline.gov.in/visa/tvoa.html](http://www.indianvisaonline.gov.in/visa/tvoa.html) (Oct. 18, 2015)]

**Table 3** Illustration of e-government relationships in the tourism domain

e-government relationship	Examples in tourism
G2G	Online tourism statistics, Destination Management Systems
G2C	Online travel safety portal; visa services, crowdsourcing ideas for tourism
G2B	Shared e-commerce platforms, platform for innovative tourist services, geographical information systems (GIS) for business to advert their location
G2N	Governmental funding for the implementation of the tourism related projects
G2E	Online training platform and courses, visa services for government diplomats
G2V	Mobile apps providing guidance and cultural references to visit touristic places in a city, visa informational services

or in the USA [[www.esta.cbp.dhs.gov/esta](http://www.esta.cbp.dhs.gov/esta) (Oct. 18, 2015)]. In the American case, the interface is provided in 23 languages, a service that could not be offered at a physical border.

Finally, Table 3 summarizes examples of e-Government interactions in the travel and tourism domain.

## 4 Conclusions, Limitations and Future Research

New ICT developments are constantly providing new business opportunities within tourism industry, which might create complex situations that need to be guided. Public governance, including interactions between government and various non-state actors collaborating with government, as well as the public policy dimension of the tourism domain need to be further explored in order to outline rules and regulations about the use of ICTs for tourism development on regional, national, and international contexts.

This research has proposed a framework of six levels of e-Government relationships within the tourism domain, namely: (1) Government to Government, (2) Government to Citizens, (3) Government to Businesses, (4) Government to Non-profit Organizations, (5) Government to Employees, and (6) Government to Visitors. The paper has reviewed several cases within the tourism industry to illustrate the proposed categories. The illustrated cases aim to raise awareness and to inform decision making on conceiving e-Governance in the tourism industry, whether on the national, provincial or local level. When decision makers need to approach a problem related to the travel and tourism domain, the illustrated cases can enhance their decision making processes by raising their awareness about the various stakeholders involved, services that can be provided to them, and the various e-Governance relationships to be considered by a government agency when planning a tourism-related policy or programme.

A limitation of this paper refers to the conceptual review conducted rather than undertaking an empirical study, which stems from the nascence of e-Government applications in the tourism domain.

Given the dawning of e-Government research, future research opportunities abound across several disciplines, including eTourism. Further research could go beyond just the mapping of existing applications. It will need to look at how such relationships are performed, how they increase or slow down the performance of the sector/organization in different national and institutional contexts, and in what ways can ICT enhance the performance and impact of such mechanisms. Further empirical studies may evaluate additional aspects of e-Government—e.g. security and privacy of tourism-related data; and the policy level the tourism industry—e.g. ICTs for green tourism, among others.

## References

- Adukaite, A., Gazizova, E., & Cantoni, L. (2014). When eGov deals with tourists. The case of visa information. In *Proceedings of the 8th International Conferences on Theory and Practice of Electronic Governance, ICEGOV2014*. Guimarães, Portugal.
- Cantoni, L., Kalbaska, N., & Inversini, A. (2009). eLearning in tourism and hospitality: A Map. *JoHLSTE – Journal of Hospitality, Leisure, Sport and Tourism Education*, 8(2), 148–156.
- Estevez, E., Fillotrani, P., Janowski, T., & Ojo A. (2011). Government information sharing: A framework for policy formulation. In: Y.-C. Chen, & P.-Y. Chu (Eds.), *Electronic Governance and Cross-Boundary Collaboration: Innovations and Advancing Tools*, IGI Global, ISBN 978-160960753-1, pp. 23–55.
- Estevez, E., Fillotrani, P., & Janowski, T. (2007). From e-government to seamless government. In *Proceedings of the Conference on Collaborative Electronic Commerce Technology and Research (COLLECTeR)*, Argentina, ISBN: 978-950-33-0625-3, pp. 269-280.
- Fang, Z. (2002). E-government in digital era: Concept, practice, and development. *International Journal of the Computer, the Internet and Management*, 10(2), 1–22.
- Go, F., & Trunfio, M. (2011). E-services governance in public and private sectors: A destination management organization perspective. In A. D’Atri et al. (Eds.), *Information technology and innovation trends in organizations* (pp. 11–19). Heidelberg: Physica Verlag.
- Gretzel, U., Fesenmaier, D. R., Formica, S., & O’Leary, J. T. (2006). Searching for the future: Challenges faced by destination marketing organizations. *Journal of Travel Research*, 45(2), 116–126.
- Hiller, J. S., & Belanger, F. (2001). Privacy strategies for electronic government. *E-government*, 200, 162–198.
- Inversini, A., Brühlhart, C., & Cantoni, L. (2012). MySwitzerland.com: Analysis of online communication and promotion. *Journal of Information Technology and Tourism*, 13(1), 39–49.
- Janowski, T. (2015). From electronic governance to policy-driven electronic governance – Evolution of technology use in government. In J. A. Danowski & L. Cantoni (Eds.), *Communication and technology* (pp. 425–439). Berlin: De Gruyter Mouton.
- Janssen, M., & Estevez, E. (2011). Lean government and platform-based governance—doing more with less. *Government Information Quarterly* 30(Suppl. 1): S1–S8.
- Kalbaska, N. (2012). Travel agents and destination management organizations: eLearning as a strategy to train tourism trade partners. *Journal of Information Technology and Tourism*, 13(1), 1–12.

- Kulesza, J. (2015). Legal issues in a networked world. In J. A. Danowski & L. Cantoni (Eds.), *Communication and technology* (pp. 345–365). Berlin: De Gruyter Mouton.
- Laynea, K., & Leeb, J. (2001). Developing fully functional E-government: A four stage model. *Government Information Quarterly*, 18, 122–136.
- Moon, M. (2002). The evolution of e-government among municipalities: Rhetoric or reality? *Public Administration Review*, 62(4), 424–433.
- Padurean, L. (2010). Destinations dynamic – a management and governance perspective. PhD thesis. Università della Svizzera italiana, Lugano, Switzerland.
- Patelis, A., Petropolous, C., Nikolopoulos, K., Lin, B., & Assimakopoulos, V. (2005). Tourism planning decision support within e-government framework. *Electronic Government: An International Journal*, 2(2), 134–143.
- Reddick, C. (2005). Citizen interaction with e-government: From the streets to servers? *Government Information Quarterly*, 22(1), 38–57.
- Sigala, M. (2011). Social media and crisis management in tourism: Applications and implications for research. *Information Technology and Tourism*, 13(4), 269–283.
- Sigala, M., & Marinidis, D. (2010). DMOs, e-democracy and collaborative destination management: An implementation framework. In U. Gretzel, R. Law, & M. Fuchs (Eds.), *Information and communication technologies in tourism* (pp. 235–246). Vienna: Springer.
- Spyriadis, T., Buhalis, D., & Fyall, A. (2011). Dynamics of destination governance: Governance and metagovernance in the composite industrial environment of destinations. In E. Laws, H. Richins, J. F. Agrusa, N. Scott (Eds.), *Tourist destination governance: Practice, theory and issues*. CABI, May 2011/Hardback/240 Pages/9781845937942.
- United Nations. (2015). United nations e-government survey 2014. e-Government for the future we want. Retrieved from: <http://unpan3.un.org>
- Werthner, H., Alzua-Sorzabal, A., Cantoni, L., Dickinger, A., Gretzel, U., Jannach, D., et al. (2015). Future research issues in IT and tourism. *Journal of Information Technology*, 15(1), 1–15.
- Wöber, K. W. (2003). Information supply in tourism management by marketing decision support systems. *Tourism Management*, 24(3), 241–255.
- Yang, J. (2010). Promoting local tourism through local government web site: An e-government application. In H. Rahman (Ed.), *Handbook of research on e-government readiness for information and service* (pp. 73–84). New York: Information Science Reference



# The Role of Information Quality, Visual Appeal and Information Facilitation in Restaurant Selection Intention

Salmalina Salleh, Noor Hazarina Hashim, and Jamie Murphy

**Abstract** The emergence of smartphones, with their multiple functions and applications, are changing behaviour in many ways, particularly among the Gen Y. Instagram, a photo-based application, allows smartphones users to share picture, write comments and include #hashtags in their posts. Drawing upon Consumer Socialization Theory (CST), this paper proposes a framework to understand how this new electronic word of mouth platform affects young consumer's restaurant selection. In addition, this paper investigates the mediating role of perceived diagnosticity on restaurant selection intention. Academically, this paper adds to the paucity of research on photo-based social media, particularly in developing countries, and extends the application of CST to online consumer behaviour research. Moreover, this paper offers ideas for restaurant operators to develop effective social media marketing strategies.

**Keywords** Instagram • eWOM • Perceived diagnosticity • Restaurant selection • #Hashtags • Consumer behaviour

## 1 Introduction

The rise of digital technologies, such as the Internet and social media, are changing how consumers communicate and socialise. Research confirms the Internet's role, especially social media, as new socialisation agents influencing young adults' consumer behaviour (Liang, 2013; Schivinski & Dabrowski, 2014). Online reviews via social media, a form of electronic word of mouth (eWOM), allow socialisation through virtual communities among people who know one another and strangers (Muratore, 2008; Okazaki, 2009).

This study draws on the Consumer Socialisation Theory (CST) as a theoretical framework because of its suitability to predict the power and outcomes of

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consumer-to-consumer information transmission among young adult consumers. Ward (1974) developed the CST to help understand the socialisation process among youth as consumers (Ali & Siraj, 2014; Fan & Li, 2010). The theory argues that skills, knowledge and attitudes develop through consumer socialisation agents such as parents, children, colleagues, relatives, friends and neighbours (Kim, Lee, & Tomiuk, 2009).

Researchers have discussed that *known contacts* such as parents and peers are key forces affecting consumer socialisation (Ghazali, 2010; Kerrane, Bettany, Kerrane, Lee, & Dobscha, 2015). The advancement of Internet technology allows people to communicate globally with unknown contact and studies found that these *unknown contacts* also influence consumer decision making (Levin & Cross, 2004; Zhu, Chang, & Luo, 2016). Until recently, there seems no research investigating the relationship between eWOM provided by unknown sources as a socialisation agent and consumers' restaurant selection intention.

In addition, research of image-based social media sites, such as Instagram, is in its infancy. The increased popularity of these photo-based social media has scholars and marketers questioning the effectiveness of text versus images in promotional media and consumer purchasing of goods and services (Dunphy, 2014). A study comparing text and image-dominant advertising by Lewis, Whitler, and Hoegg (2013) suggests that text and image advertising are interdependent in delivering a promotional message.

Despite tourism and hospitality studies investigating eWOM, there is limited research on different eWOM elements and consumer restaurant selection. The combination of growth in the restaurant sector and the advent of mobile and Internet technologies allows guests to share their dining experiences with others on social networking sites. Consumers post photos, leave comments, tag other users, and add hashtags, which then inform others (Hoffman & Novak, 2012). From the post, other users can see the pictures and read the comments, and some may intend to visit the restaurant.

To help fill this gap, this conceptual study assumes that three eWOM elements—information quality, visual appeal, and information facilitation—from unknown contacts influence restaurant selection intention, based on consumer socialisation. Information quality refers to textual information on a post while visual appeal refers to customer perceptions on photos provided by Instagram users. Finally, information facilitation refers to the role of hashtags in facilitating information search on Instagram.

In addition, this paper proposes diagnosticity as a mediating variable in consumer decision-making. Academics often define perceived diagnosticity as information helpfulness for assessing product quality and performance (Mudambi & Schuff, 2010). The advancement of Internet technology allows people to communicate globally with *unknown contacts*, but questions on the perceived diagnosticity of information remains.

Practically, the proposed variables and framework help restaurants review and improve their social media marketing strategy. Academically, this paper expands CST theory to *unknown contacts'* social media influence in young consumer

decision-making and adds to the limited restaurant social media studies, particularly in a developing country, Malaysia. Specifically, this study investigates:

1. The relationship of information quality, visual appeal, and information facilitation features on perceived diagnosticity, and;
2. The mediating effect of perceived diagnosticity on the relationship among information quality, visual appeal, and information facilitation with restaurant selection intention.

The following section reviews related research, leading to a conceptual framework and accompanying propositions.

## 2 Literature Review and Propositions

### 2.1 *Information Quality*

Consumer behaviour literature agrees on information's role in consumer decision-making (Cox, Burgess, Sellitto, & Buultjens, 2009; Gao, Zhang, Wang, & Ba, 2012). Quality information helps consumers access product quality, reduce purchase risk and increase the intention to purchase.

Before the Internet and information technologies came of age, consumers obtained information offline. For instance, in tourism marketing, brochures were an important information source widely utilised by tourist (Getz & Sailor, 1994; Yamamoto & Gill, 1999). Besides brochures, printed advertising, radio, television, product trials, samples, demonstrations, and word of mouth are examples of offline information sources in consumer decision making (Unni, 2000).

Since the existence of websites, there has been an explosion of websites with a tremendous amount of information, high and low quality, as well as misleading information (Flanagin & Metzger, 2007). The increasing number of websites nowadays has necessitated the need of measurement criteria to evaluate website information quality (Hasan & Abuelrub, 2011).

Unlike websites, online reviews or eWOM via social media differ in organisational control. It is difficult for organisations to persuade consumers to provide high quality information. Thus, researchers began to extend the information quality dimensions of social media such as believability, objectivity, reputation, sufficiency, timeliness, relevancy, understandability, completeness, accuracy, consistency and value-added (Filieri & McLeay, 2014; Wu, Van Der Heijden, & Korfiatis, 2011).

Researchers agree that consumers will perceive an online review or eWOM as diagnostic if the review facilitates consumer product evaluation prior to purchase (Mudambi & Schuff, 2010; Qiu, Pang, & Lim, 2012). Perceived diagnosticity is information helpfulness for assessing product quality and performance (Mudambi & Schuff, 2010). Studies confirm the positive effect of information quality on

perceived diagnosticity. For instance Filieri (2015) found that information quality in eWOM confirmed the positive influence of information diagnosticity. Hence, information quality seems a key predictor of perceived diagnosticity. Extending the positive eWOM and perceived diagnosticity findings to Instagram, where users post reviews and share information and comments, this paper proposes that:

*Proposition 1: Information quality provided by Instagram users positively affects perceived diagnosticity.*

## 2.2 Visual Appeal

The past two decades have witnessed an increase interest in visual appeal, especially in advertising research (Kisielius & Sternthal, 1984; Mitchell, 1986). Visual appeal may appear as pictures, photos, images or videos that can display information in multiple ways including different sizes, angles, perspectives, movement and animation. In marketing, visual appeals such as product pictures or videos play a vital role in attracting customer attention and influencing decision-making (Lee & Shin, 2014; Teng, Ye, Yu, & Wu, 2014). Visual appeals can change beliefs about a good or service and are an element in eWOM communication (Kim & Lennon, 2008).

The use of pictures has been in advertising since at least the 1950s (Messaris, 1996). Pictures in advertisements support the verbal information. In destination marketing for example, research has shown that visual information through pictures is more memorable than verbal information (Babin, Burns, & Biswas, 1992). In addition, studies demonstrate that pictures in advertisements enhance advertisement recall if the verbal information provided is insufficient (Pieters & Wedel, 2004). Researchers agree that pictures surpass text in recalling goods and services (Clow, James, Kranenburg, & Berry, 2006).

A new application of pictures, photo based social media such as Instagram, are changing how people interact with photos and brands. Many companies, such as Forever21 and Nike, use Instagram heavily to market their products and brands, and interact with their followers (Miles, 2013). In the service industry, photos reduce consumer uncertainty about the product and reduce the risks associated with intangibility. For instance, pictures of food often stimulate food selection (Laska, Freist, & Krause, 2007). Pan, Zhang, and Law (2013) found that hotel pictures were important in helping consumer decision making, confidence and product evaluation.

Song and Kim (2012) suggested that compared to smaller photos, bigger photos help increase consumer purchase intentions. A study by Yoo and Kim (2014) found that the presence of pictures online, facilitate consumers' virtual product experience and can help form positive images that lead to purchase intention. A study by Jiang and Benbasat (2004) indicated that visual information helps enhance perceived diagnosticity of products, and thus increase consumer confidence and belief in their

product choice. The above discussion suggests that visual appeal can be diagnostic if the visual helps consumers' access product quality prior to purchase intention. Thus:

*Proposition 2: Visual appeals will affect perceived diagnosticity.*

### **2.3 Information Facilitation**

Facilitation refers to assisting in a task (Kim, Wang, & Ahn, 2013). Hashtags facilitate social media users in many ways, such as finding topical content. The hashtag keywords help users in diverse social media identify and form communities, and allow newcomers to join the communities. Hashtags, with the symbol “#” followed by keywords, acronyms or phrases with no spaces, allows users to classify a post and provide topical information easily and instantly. For example, users could add #Malaysiafood and #Nasigoreng to a posted picture of the popular Malaysian dish containing fried rice.

Moreover, appropriate keyword hashtags can provide useful information. Researchers have explored emerging hashtag functions. Gupta, Li, Yin, and Han (2010) suggest four reasons people tag, namely to facilitate *description*, *navigation*, *interest sharing* and *exposure*. Chang (2010) applied the Diffusion of Innovations theory to investigate hashtag adoption in Twitter. The study confirmed that hashtags help enhance findability, accessibility and navigation to facilitated users' information search.

The use of hashtags has become popular among social media users and potentially creates a new form of eWOM marketing (Oosterveer & Van Aquinostraat, 2011). The heavy use of hashtags indicates its reliance by users in information gathering and sharing activities. Nonetheless, not all social media or social network sites have this features. At present, only Twitter and Instagram actively use this function. The characteristics of hashtags facilitates consumer information search and help simplify the search activities. Therefore, as the hashtags provide extra information and picture descriptions, the authors propose that,

*Proposition 3: Information facilitation provided by the #hashtags in Instagram will affects perceived diagnosticity.*

### **2.4 Perceived Diagnosticity**

Perceived diagnosticity is a subset of information processing (Feldman & Lynch, 1988). Consumers form judgements or make purchase decisions based on information from different sources, such as advertising, promotional material, word of mouth, media or salespeople. In consumer behaviour, the term diagnosticity is

interchangeable with terms such evaluation, review and judgement (Engel, Kollat, & Blackwell, 1968; Kotler & Armstrong, 2014)

The widely-used consumer decision model by Engel et al. (1968) describes product evaluation, or diagnostics, as a stage that every consumer undergoes before making a selection decision. The evaluation process however, may vary among consumers depending on their experiences and the product type. For instance, for a staple such as rice, consumers evaluate the product and brand carefully because the rice comes with different prices and quality. Therefore, consumers use the information wisely to decide final brand choices.

Studies explicate the effect of perceived diagnosticity for predicting consumer purchase intention in product trial, virtual shopping environments, product learning, virtual brand experiences and eWOM (Jiang & Benbasat, 2004; Qiu et al., 2012). Simply put, perceived diagnosticity relates to customer perceptions on the information that is helpful in evaluating a product, service or brand.

Studies often suggest conceptualising information diagnosticity as the degree of helpful information (Filieri, 2015; Qiu et al., 2012). High information diagnosticity could help customers understand the product carefully and influence consumer cognitive assessment of product features. As such, when the information provided in eWOM is positive and diagnostic, it could persuade customers on the product quality and purchase intention. Thus:

*Proposition 4: Positive perceived diagnosticity will lead to higher intention to select a restaurant.*

Wu et al.(2011) explains that based on information diagnosticity, the information provided in eWOM could help other customers in making a decision. Filieri (2015) affirms a positive association between information quality and perceived diagnosticity. Wang and Chang (2013) confirm that perceived diagnosticity correlates with purchase intention. Thus, this study proposes perceived diagnosticity as a mediator in explaining purchase intention based on eWOM information quality. Thus:

*Proposition 5<sub>a</sub>: Perceived diagnosticity mediates the relationship between information quality and customer intention to select a restaurant.*

Research suggests that photos can attract customer attention that leads to purchase intention (Lee & Shin, 2014; Lin, Lu, & Wu, 2012; Stringam & Gerdes, 2010). Moreover, photos increase customer intentions to purchase due to psychological or emotional feelings after seeing pictures of people having fun and involved in activities (Shiratuddin, Hassan, & Landoni, 2003). There is a link between visual appeal and purchase intention.

Furthermore, some empirical studies stress the connection between visual appeal and perceived diagnosticity, as well as the connection between perceived diagnosticity and purchase intention. For instance, Laska et al. (2007) argue that visual systems guide food selection. Jeong and Choi (2005) note that photos on hotel websites help customers visualise the hotel's overall performance. Song and Kim (2012) observe that larger photos could help customers receive more

information and lead to purchase intention. Finally, Wang (2011) suggests that the photo presence could help customers generate desired tastes and shape perceptions against the flavour that eventually will impact individual intentions to have direct experiences. Therefore, the authors propose:

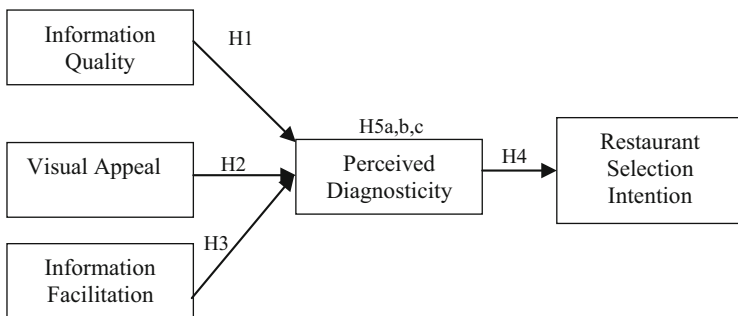
*Proposition 5<sub>b</sub>: Perceived diagnosticity mediates the relationship between visual appeal and intention to select restaurant.*

Besides information quality and visual appeal, the use of #hashtags as information facilitation in eWOM allows social media users to categorise content interest, spread information and share similar interests. According to Jacoby (2002), WOM or eWOM communication act as stimuli that affect consumers’ cognitive and affective reactions, which lead to behavioural intentions. A cognitive reaction such as perceived diagnosticity is the process whereby customers consider the information received to assist in evaluating products (Wang & Chang, 2013). Based on CST, the communication process influences consumer’s cognitive, affective and behavioural attitudes (Ward, 1974). Thus,

*Proposition 5<sub>c</sub>: Perceived diagnosticity mediates the relationship between information facilitation provided by the #hashtags in Instagram and intention to select restaurant.*

### 3 Conceptual Framework

This research studies the impact of eWOM on consumer behaviour toward restaurant selection intention. This paper’s conceptual model aims to explain to what extent three eWOM elements can influence the behaviour of respondents toward restaurant selection intention. The framework in Fig. 1 summarises the literature review and propositions. The left part of the framework shows three eWOM elements—information quality, visual appeal and information facilitation—while



**Fig. 1** Conceptual framework

perceived diagnosticity mediates the relationship between these three eWOM elements and restaurant selection intention.

This research proposes surveying Instagram users with experience using Instagram to search for restaurants as the population to test the framework.

## 4 Conclusion

This conceptual paper proposes to model the effect of information quality, visual appeal, and information facilitation on restaurant selection intention and the mediating effect of perceived diagnosticity on the relationship among information quality, visual appeal, and information facilitation with restaurant selection intention. The proposed model should help industry players improve their social media marketing strategies and consider photo-based social media, such as Instagram, as important marketing tools.

Academically, this paper proposes perceived diagnosticity as a mediating variable in the framework. This conceptual paper helps fill a gap in the literature about eWOM's influence on restaurant selection intention and helps address some limitations in restaurant selection research. This paper will add to the dearth of research of social media and the restaurant industry, in general, and in a developing country, Malaysia.

## References

- Ali, A., & Siraj, S. (2014). Role of family communications including parenting styles on consumer socialization of children: A retrospective look at forty years of research. *Humanistic Management Network, Research Paper Series* (2429335).
- Babin, L. A., Burns, A. C., & Biswas, A. (1992). A framework providing direction for research on communications effects of mental imagery-evoking advertising strategies. *Advances in Consumer Research*, 19(1), 621–628.
- Chang, H. C. (2010). A new perspective on Twitter hashtag use: Diffusion of innovation theory. *Proceedings of the American Society for Information Science and Technology*, 47(1), 1–4.
- Clow, K. E., James, K. E., Kranenburg, K. E., & Berry, C. T. (2006). The relationship of the visual element of an advertisement to service quality expectations and source credibility. *Journal of Services Marketing*, 20(6), 404–411.
- Cox, C., Burgess, S., Sellitto, C., & Buultjens, J. (2009). The role of user-generated content in tourists' travel planning behavior. *Journal of Hospitality Marketing and Management*, 18(8), 743–764.
- Dunphy, J. (2014). The power of visual content and image-based social networks. Retrieved 10 August 2014, from [https://hotelexecutive.com/business\\_review/3658/the-power-of-visual-content-and-image-based-social-networks](https://hotelexecutive.com/business_review/3658/the-power-of-visual-content-and-image-based-social-networks)
- Engel, J. F., Kollat, D. T., & Blackwell, R. D. (1968). *Consumer behavior*. New York: Rinehart and Winston.
- Fan, Y., & Li, Y. (2010). Children's buying behaviour in China: A study of their information sources. *Marketing Intelligence and Planning*, 28(2), 170–187.



- Feldman, J. M., & Lynch, J. G. (1988). Self-generated validity and other effects of measurement on belief, attitude, intention, and behavior. *Journal of Applied Psychology, 73*(3), 421.
- Filieri, R. (2015). What makes online reviews helpful? A diagnosticity-adoption framework to explain informational and normative influences in e-WOM. *Journal of Business Research, 68*(6), 1261–1270.
- Filieri, R., & McLeay, F. (2014). E-WOM and accommodation an analysis of the factors that influence travelers' adoption of information from online reviews. *Journal of Travel Research, 53*(1), 44–57.
- Flanagin, A. J., & Metzger, M. J. (2007). The role of site features, user attributes, and information verification behaviors on the perceived credibility of web-based information. *New Media and Society, 9*(2), 319–342.
- Gao, J., Zhang, C., Wang, K., & Ba, S. (2012). Understanding online purchase decision making: The effects of unconscious thought, information quality, and information quantity. *Decision Support Systems, 53*(4), 772–781.
- Getz, D., & Sailor, L. (1994). Design of destination and attraction-specific brochures. *Journal of Travel and Tourism Marketing, 2*(2–3), 111–131.
- Ghazali, Z. (2010). The influence of socialization agents and demographic profiles on brand consciousness. *International Journal of Management and Marketing Research, 4*(1), 19–29.
- Gupta, M., Li, R., Yin, Z., & Han, J. (2010). Survey on social tagging techniques. *ACM SIGKDD Explorations Newsletter, 12*(1), 58–72.
- Hasan, L., & Abuelrub, E. (2011). Assessing the quality of web sites. *Applied Computing and Informatics, 9*(1), 11–29.
- Hoffman, D. L., & Novak, T. P. (2012). Toward a deeper understanding of social media. *Journal of Interactive Marketing, 26*(2), 69–70.
- Jacoby, J. (2002). Stimulus-organism-response reconsidered: An evolutionary step in modeling (consumer) behavior. *Journal of Consumer Psychology, 12*(1), 51–57.
- Jeong, M., & Choi, J. (2005). Effects of picture presentations on customers' behavioral intentions on the web. *Journal of Travel and Tourism Marketing, 17*(2–3), 193–204.
- Jiang, Z., & Benbasat, I. (2004). Virtual product experience: Effects of visual and functional control of products on perceived diagnosticity and flow in electronic shopping. *Journal of Management Information Systems, 21*(3), 111–147.
- Kerrane, B., Bettany, S. M., Kerrane, K., Lee, N., & Dobscha, S. (2015). Siblings as socialization agents: Exploring the role of 'sibship' in the consumer socialization of children. *European Journal of Marketing, 49*(5/6).
- Kim, C., Lee, H., & Tomiuk, M. A. (2009). Adolescents' perceptions of family communication patterns and some aspects of their consumer socialization. *Psychology and Marketing, 26*(10), 888–907.
- Kim, M., & Lennon, S. (2008). The effects of visual and verbal information on attitudes and purchase intentions in internet shopping. *Psychology and Marketing, 25*(2), 146–178.
- Kim, S. S., Wang, K.-C., & Ahn, T. H. (2013). Which endorser and content are most influential in Korean restaurant promotions? *International Journal of Hospitality Management, 33*, 208–218.
- Kisielius, J., & Sternthal, B. (1984). Detecting and explaining vividness effects in attitudinal judgments. *Journal of Marketing Research, 21*, 54–64.
- Kotler, P., & Armstrong, G. (2014). *Principles of marketing* (15th ed.). Harlow: Pearson Education.
- Laska, M., Freist, P., & Krause, S. (2007). Which senses play a role in nonhuman primate food selection? A comparison between squirrel monkeys and spider monkeys. *American Journal of Primatology, 69*(3), 282–294.
- Lee, E.-J., & Shin, S. Y. (2014). When do consumers buy online product reviews? Effects of review quality, product type, and reviewer's photo. *Computers in Human Behavior, 31*, 356–366.
- Levin, D. Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science, 50*(11), 1477–1490.

- Lewis, M., Whitley, K. A., & Hoegg, J. (2013). Customer relationship stage and the use of picture-dominant versus text-dominant advertising: A field study. *Journal of Retailing*, 89(3), 263–280.
- Liang, Y.-W. (2013). Children's influence on purchasing tourism products via the internet: Parental power versus children's power—The social power perspective. *Journal of Travel and Tourism Marketing*, 30(7), 639–661.
- Lin, T. M. Y., Lu, K.-Y., & Wu, J.-J. (2012). The effects of visual information in eWOM communication. *Journal of Research in Interactive Marketing*, 6(1), 7–26.
- Messaris, P. (1996). *Visual persuasion: The role of images in advertising*. Thousand Oaks, CA: Sage.
- Miles, J. (2013). *Instagram power: Build your brand and reach more customers with the power of pictures*. New York: McGraw Hill Professional.
- Mitchell, A. A. (1986). The effect of verbal and visual components of advertisements on brand attitudes and attitude toward the advertisement. *Journal of Consumer Research*, 13, 12–24.
- Mudambi, S. M., & Schuff, D. (2010). What makes a helpful online review? A study of customer reviews on Amazon.com. *MIS Quarterly*, 34(1), 185–200.
- Muratore, I. (2008). Teenagers, blogs and socialization: A case study of young French bloggers. *Young Consumers: Insight and Ideas for Responsible Marketers*, 9(2), 131–142.
- Okazaki, S. (2009). The tactical use of mobile marketing: How adolescents' social networking can best shape brand extensions. *Journal of Advertising Research*, 49(1), 12–26.
- Oosterveer, D., & Van Aquinostraat, T. (2011). *Tweets as online word of mouth: Influencing and measuring Ewom On Twitter*. Unpublished Master, Radboud University, Nijmegen.
- Pan, B., Zhang, L., & Law, R. (2013). The complex matter of online hotel choice. *Cornell Hospitality Quarterly*, 54(1), 74–83.
- Pieters, R., & Wedel, M. (2004). Attention capture and transfer in advertising: Brand, pictorial, and text-size effects. *Journal of Marketing*, 68(2), 36–50.
- Qiu, L., Pang, J., & Lim, K. H. (2012). Effects of conflicting aggregated rating on eWOM review credibility and diagnosticity: The moderating role of review valence. *Decision Support Systems*, 54(1), 631–643.
- Schivinski, B., & Dabrowski, D. (2014). The effect of social media communication on consumer perceptions of brands. *Journal of Marketing Communications* (ahead-of-print), 1–26.
- Shiratuddin, N., Hassan, S., & Landoni, M. (2003). A usability study for promoting eContent in higher education. *Educational Technology and Society*, 6(4), 112–124.
- Song, S. S., & Kim, M. (2012). Does more mean better? An examination of visual product presentation in e-retailing. *Journal of Electronic Commerce Research*, 13(4), 345–355.
- Stringam, B. B., & Gerdes, J. J. (2010). Are pictures worth a thousand room nights? Success factors for hotel web site design. *Journal of Hospitality and Tourism Technology*, 1(1), 30–49.
- Teng, L., Ye, N., Yu, Y., & Wu, X. (2014). Effects of culturally verbal and visual congruency/incongruency across cultures in a competitive advertising context. *Journal of Business Research*, 67(3), 288–294.
- Unni, R. M. (2000). *Relative effectiveness of electronic vs. traditional sources in communicating product information*. Unpublished Doctoral, Indiana University.
- Wang, H.-Y. (2011). Exploring the factors of gastronomy blogs influencing readers' intention to taste. *International Journal of Hospitality Management*, 30(3), 503–514.
- Wang, J. C., & Chang, C. H. (2013). How online social ties and product-related risks influence purchase intentions: A Facebook experiment. *Electric Commerce Research and Applications*, 12(5), 337–346.
- Ward, S. (1974). Consumer socialization. *Journal of Consumer Research*, 1(2), 1–14.
- Wu, P. F., Van Der Heijden, H., & Korfiatis, N. (2011). *The influences of negativity and review quality on the helpfulness of online reviews*. Paper presented at the Proceedings of the International Conference on Information Systems.
- Yamamoto, D., & Gill, A. M. (1999). Emerging trends in Japanese package tourism. *Journal of Travel Research*, 38(2), 134–143.

- Yoo, J., & Kim, M. (2014). The effects of online product presentation on consumer responses: A mental imagery perspective. *Journal of Business Research*, 67(11), 2464–2472.
- Zhu, D. H., Chang, Y. P., & Luo, J. J. (2016). Understanding the influence of C2C communication on purchase decision in online communities from a perspective of information adoption model. *Telematics and Informatics*, 33(1), 8–16.

# Why Are There More Hotels in Tyrol than in Austria? Analyzing Schema.org Usage in the Hotel Domain

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**Abstract** It has been almost 4 years now since the world's leading search engine operators, Bing, Google, Yahoo! and Yandex, decided to start working on an initiative to enrich web pages with structured data, known as schema.org. Since then, many web masters and those responsible for web pages started adapting this technology to enrich websites with semantic information. This paper analyzes parts of the structured data in the largest available open to the public web crawl, the *Common Crawl*, to find out how the hotel branch is using schema.org. On the use case of *schema.org/Hotel*, this paper studies who uses it, how it is applied and whether or not the classes and properties of the vocabulary are used in the syntactically and semantically correct way. Further, this paper will compare the usage based on numbers of 2013 and 2014 to find out whether or not an increase in usage can be noted. We observe a wide and growing distribution of schema.org, but also a large variety of erroneous and restricted usage of schema.org within the data set, which makes the data hard to use for real-life applications. When it comes to geographical comparison, the outcome shows that the United States are far in the lead with annotation of hotels with schema.org and Europe still has work to do to catch up.

**Keywords** Schema.org • Semantic annotation • Analysis • Hotel • Tourism

## 1 Introduction

Particularly in tourism, the web has evolved to become the most important medium for representing businesses and distributing information about offers, events and other facts to potential customers. A well-structured and state-of-the-art web page is essential, especially when it comes to search requests about business related information on search engine websites. The method, which search engines use to rank the popularity of certain pages, changes frequently over time, and is probably the best kept secret of search engine providers, and hence a large challenge for web

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masters and search engine optimization experts. This makes it even more important to stick to recommendations or standards concerning content mark-up on web pages and to follow initiatives launched by search engine operators, like *schema.org*.<sup>1</sup>

On June 2nd 2011, the world's biggest search engines, Google, Bing and Yahoo! launched *schema.org*. On November 1st of the same year, the operator of the largest Russian search engine, Yandex, joined the initiative and together they are constantly working on the refinement and the further development of this set of vocabulary. After these companies announced that the usage of *schema.org* will lead to significantly better search results and search engines presence and rankings, numerous websites started annotating their content with the vocabulary provided by *schema.org*. Google, for example, uses the data annotated with *schema.org* to show *Rich Snippets* in their search results, which leads to a more enhanced and detailed representation on the pages displaying the search results.

The *Common Crawl*<sup>2</sup> is an organization which crawls the web several times a year and provides the collected archives and data sets to the public for free. *Web Data Commons*<sup>3</sup> is a project started in 2012 by *Freie Universität Berlin* and the *Karlsruhe Institute of Technology*, and it extracts different sorts of structured data from the *Common Crawl* and also provides them to the public for free.

In this paper, we analyse a data set within *Web Data Commons*, containing Microdata, RDFa and Microformat, used to annotate web page content with *schema.org* (Meusel, Petrovski, & Bizer, 2014). Technically, Microdata, RDFa and Microformats are notations to add frontend-invisible but machine-readable information to HTML code on the attribute level. We present our work on acquiring a comprehensive overview of the distribution of hotel specific *schema.org* vocabulary over the web, on the example of the type *schema.org/Hotel*.

This paper is structured as follows. Section 2 overviews related work done in this field so far and states specific research questions. Section 3 explains the methodology used to analyse the data in detail and shows technical insights. Section 4 presents the findings of the research. Section 5 concludes the paper, sums up the outcome and gives an outlook on how we are going to proceed in this direction in the future.

## 2 Related Work and Research Questions

In this section we are reviewing work done by other researchers in the use of semantic structured touristic data on the web and defining the contribution we want to make by specifying four research questions.

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<sup>1</sup> <http://www.schema.org>

<sup>2</sup> <http://commoncrawl.org>

<sup>3</sup> <http://webdatacommons.org>

## 2.1 Related Work

**State of the Art in Semantic Touristic Annotation** During our work, we came across certain efforts which are related to our research. The first to be mentioned in the ontology based touristic research direction is *Harmonise*. It is an EU-project aiming to provide a data exchange method for touristic organizations. *Harmonise* deals with business-to-business (B2B) integration on the information layer by means of an ontology-based mediation” (Fodor & Werthner, 2005). The idea is, that existing proprietary data standards have not to be changed, but can communicate without any restrictions.

Further, the semantic web for touristic purposes can be used in applications, for example, in an intelligent tour planning tool based on the semantic web (Jakkilinki, Georgievski, & Sharda, 2007). The paper by Zanker, Fuchs, Seebacher, Jessenitschnig, and Stromberger (2009) presents an approach to automatically associate geospatial properties to related touristic products. This idea is based on semantic annotated content and could possibly be applied to schema.org annotated touristic data.

Stavrakantonakis, Toma, Fensel, and Fensel (2014) survey the use of Web 2.0 technologies, content management systems and social channels and Web 3.0 technologies, as well as the use of semantic web technologies and structured data on websites of 2155 hotels in Austria. The outcome of this research is, that only 5 % of the website employ semantic technologies and the vast majority of 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” (Stavrakantonakis et al., 2014).

Further, obviously the work of Meusel et al. (2014), where the authors report on their work on the Web Data Commons project, is relevant. The paper describes how structured data in the form of Microdata, Microformats and RDFa data, is extracted from the Creative Commons corpus, processed to N-quads format and provided in several “Schema.org Class Specific Data-Subsets” (Meusel et al., 2014) for public download. We were using this data as the starting point for our analysis.

During the analysis, we came across several cases of wrong usage of schema.org, like typos in attributes or classes, wrong data type usage, wrong attribute or class usage. Meusel and Paulheim (2015) describe a “quantitative analysis of common mistakes in Microdata provision” and discuss heuristics to fix mistakes on the data consumer side. This paper could serve as a starting point for our further work, when we want to give advice on the semantically and syntactically correct usage of schema.org annotations. We will talk more about that in Sect. 5.

**Related Vocabularies and Applications** The vocabulary of schema.org to describe hotels or, to be more generic, tourist accommodation, is far from comprehensive: useful properties to describe the service offers in detail are missing. During our research we found examples for vocabularies which could enrich the schema.

org vocabulary with important properties, such as those described in the “Accommodation Ontology” by Hepp (2013).

When it comes to finding and choosing the most suitable vocabulary, a project worth mentioning is vocab.cc.<sup>4</sup> It is an open source project which allows users to search for linked data vocabularies, based on the dataset of the Billion Triple Challenge.<sup>5</sup>

Another direction towards application of schema.org is in the development of tools assisting web developers to easily and correctly introduce schema.org annotations. One example here is the WYSIWYM project described by Khalili and Auer (2013): the authors present a “concept for direct manipulation of semantically structured content in conventional modalities”.

The available schema.org annotations have a commercial exploitation potential, which is currently pursued by several institutions. For example, current STI Innsbruck’s start-up ONLIM<sup>6</sup> is applying annotations on online social media technologies in its product, social media marketing tool. The start-up already runs pilots with touristic associations from Innsbruck,<sup>7</sup> and offers semantic dissemination by implementing schema.org support on their website and publishing the touristic data of the regions as linked open data. More about the work on the schema.org-based pilot with the touristic association of Innsbruck has been published by Toma, Stanciu, Fensel, Stavrakantonakis, and Fensel (2014).

## 2.2 *Research Questions*

For our analysis on how the hotels are applying the semantic schema.org format in practice, we define key research questions we want to answer. These are:

1. How many hotels use schema.org?
2. Is schema.org used syntactically and semantically correctly or are there many mistakes?
3. Who is using schema.org in the hotel domain?
4. Is the use of schema.org in the hotel domain increasing?

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<sup>4</sup> <http://vocab.cc/about.html>

<sup>5</sup> <http://km.aifb.kit.edu/projects/btc-2012/>

<sup>6</sup> <http://www.onlim.com>

<sup>7</sup> <http://www.innsbruck.info>

### 3 Methodology

This section describes how we approached the analysis. We describe in detail the origin of the data, the technical aspect of the work on the *Web Data Commons* data set, and explain how we measured the outcome.

#### 3.1 Data Origins

As mentioned in the introduction, the primary source of our data was the result of the *Common Crawl*. Since our analysis should be based only on structured data and, to be more detailed, on schema.org, we took advantage of a project called *Web Data Commons*. This project uses the data from *Common Crawl* and extracts all sorts of structured data which then are divided into three main data sets. The *Hyperlink Graph*, which contains 3.5 billion web pages as vertices and 128 billion hyperlinks between these pages as edges, the *Web Tables*, which contain 147 million relational web tables and are used for data search, table augmentation, knowledge base construction and NLP tasks<sup>8</sup> and the RDFa, Microdata and Microformat dataset upon which our interest lies. From this dataset we are using the “Schema.org Class Specific Data-Subsets” and from those subsets, the one containing all triples related to schema.org/Hotel. A triple is a typical way to save data in semantic web related context. Unlike in a relational database, where every row corresponds to an entry and every column corresponds to a property of that entry, a triple always consists of three “columns”: the subject, the predicate and the object. The subject and the object are “things”, while the predicate is the relation between those two. For example: *hotel—hasName—name*, or *hotel1—schema:hasName—“Adler”*

The data can be downloaded from the Web Data Commons website<sup>9</sup> in NQuad format (Cyganiak, Harth, & Hogan, 2008), which means that there is an extra, fourth column added to extend the triple with context. In that particular case, the context represents the URL to the website on which the triple was found, so we could call it the data provenance column. The schema.org/Hotel specific subset of the 2013 crawl was 2.2 GB compressed, and 35 GB uncompressed, and the 2014 crawl has 2.9 GB compressed and 38.3 GB in uncompressed size. Since the crawling methodology of the Common Crawl follows certain rules when collecting data on the web, we did figure out some limitations in the dataset, for example if a platform has restrictions in their robot.txt file which disallows crawlers to search their site.

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<sup>8</sup> <http://webdatacommons.org>

<sup>9</sup> [http://webdatacommons.org/structureddata/2013-11/stats/schema org\\_subsets.html](http://webdatacommons.org/structureddata/2013-11/stats/schema_org_subsets.html)



### 3.2 *Technical Details*

To work with the data, there are several different ways of how the data could be examined. Stream processing, analysis with shell scripts or, the way we preferred, loading it into a RDF repository. We chose that approach because it is the one we have most experience and feel most skilled working with.

For working on our dataset, we set up a Linux Debian Wheezy on an Hp ProLiant DL 385 server with 2 AMD Opteron(tm) processor 280 with two cores each and 32GB of main memory and installed GraphDB-SE<sup>10</sup> inside an Apache Tomcat 6.0.35<sup>11</sup> environment. The main memory was quite sparsely measured, but for 127 M (2013) or 148 M (2014) triples and the querying we were planning to do (primarily aggregation function querying) it was sufficient. After downloading the schema.org/Hotel subset to the server and uncompressing it we loaded the data into the GraphDB store.

To proceed with the actual querying we developed a small testing environment in Java. We used the Java Sesame API<sup>12</sup> to establish a connection to our repository and the JUnit Test Framework<sup>13</sup> to run the queries against it. As a query language we used SPARQL (Prud'hommeaux & Seaborne, 2008). In the testing environment every Unit test represents one query and the output is saved as comma separated value (CSV) file on the local file system, just like a tabular output inside the Sesame Workbench.<sup>14</sup>

After running the JUnit test set and producing all desired outputs, we inspected the CSV files manually and/or used Microsoft Excel for further calculations or the creation of charts and other visualizations.

### 3.3 *Analysis*

To find answers to the questions mentioned in Sect. 2.2 we used a lot of different queries. We mention and describe the most important ones below:

- **Count all hotels:** a query which returns all triples of rdf type schema.org/Hotel.
- **Count hotels per country:** this query looks up all hotels associated with an attribute for schema.org/Country/name, groups them by said name and counts the occurrences of the hotels per country.

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<sup>10</sup> <http://graphdb.ontotext.com/display/GraphDB6/GraphDB-SE>

<sup>11</sup> <http://tomcat.apache.org/>

<sup>12</sup> <http://rdf4j.org/>

<sup>13</sup> <http://junit.org/>

<sup>14</sup> <http://rdf4j.org/sesame/2.8/docs/articles/workbench.docbook>

- **Count hotels per rating:** looks up all hotels associated with `schema.org/Rating` and lists them grouped by rating like the query mentioned before does for countries.
- **Count properties of hotels:** Lists all properties of all hotels found, groups and counts them.
- **Count all hotels with address:** Counts only hotels which are associated with an attribute of the type `schema.org/PostalAddress` for the purpose of finding out how many hotels even have addresses. Similar queries exist for `schema.org/Country`, `schema.org/Country/Name`, `schema.org/streetAddress`, `schema.org/Rating` and others.

Overall we used 37 different queries. The measurement and analysis of the collected data, which was present in CSV tables, was then mostly done by hand or by arithmetic functions in Microsoft Excel, as well as the generation of the charts and diagrams.

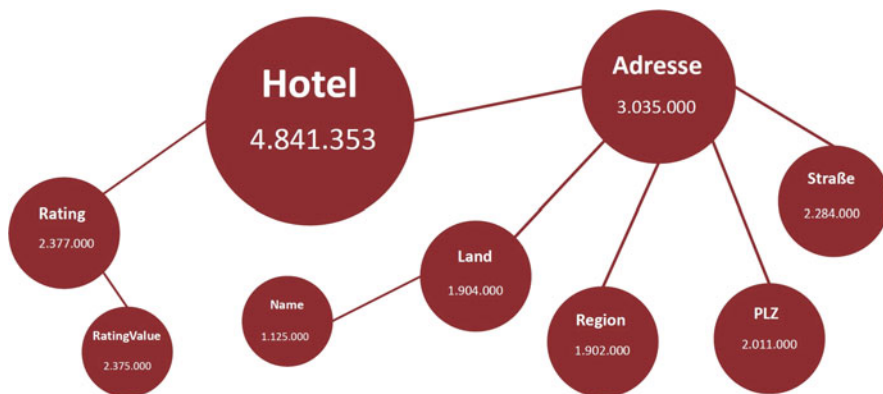
## 4 Results

In the following section we present the results of our analysis of the `schema.org/Hotel` related structured data on the 2013 and the 2014 corpus of the *Web Data Commons* project. In Sect. 2 of the paper, we have defined four main questions which will be answered below.

### 4.1 How Many Hotels Use Schema.org?

When trying to find out how many hotels are present in the triple store, one can first query for all triples with predicate `rdf:type` and object `schema.org/Hotel` and count them. The output would be about 4,841,000 hotels in the whole data set. But after a manual inspection, it is clearly visible that many hotels are annotated more than once because, for example, they have `schema.org` annotations on their own website and are annotated in listings of one or several booking platforms. Trying to do the same query with the restriction of only counting hotels with unique names results in a reduced number, about 740,000, which is also not expressive, because details about the hotels with same names, like for example Hotel Post or Hotel Adler—which are very common hotel names in Austria, are then lost.

A solution to that problem would have been to perform a search on unique hotel names and locations or addresses, but we observe that less than 75 % of the hotels in the dataset have proper annotation for an address. To be more detailed, only about 3 million hotels added of `schema.org/Address`, 2.2 million Hotels used `schema.org/street`, 2 million hotels used `schema.org/zip`, 1.9 million hotels used `schema.org/land` and `schema.org/Region` and only 1.1 million hotels used `schema.org/name` as a



**Fig. 1** Classes and properties used in the data set

**Table 1** Distribution of hotel triples per country

Rank	Country	Sum	Percentage
1	US	1,021,513	90.8 %
2	CA	52,360	4.7 %
3	CN	20,648	1.8 %
4	GB	11,580	1.0 %
5	DE	3163	0.28 %
6	MX	1921	0.17 %
7	PR	1250	0.1 %
8	AR	1016	0.09 %
9	PH	765	0.07 %
10	IN	699	0.06 %
...	...	...	...
25	AT	148	0.013 %
	Other	10,085	0.9 %

country name. See Fig. 1 for more details. When we did a generic search for one specific hotel with a very common name, we found several appearances of which the most did not have an address associated and hence could not be associated with a real hotel.

If we count all appearances of annotations of hotels per country, of course, only for those 23.2 % of hotels which have an annotation for `schema.org/postalAddress` and `schema.org/name` within `postalAddress`, we come to the conclusion that the large majority of triples is found within the United States, followed by Canada, China, Great Britain, Germany and others. See a detailed listing in Table 1.

To double check on the reliability of this data we chose a region and a city within which to count hotel triples. As hotels play an important role in the Austrian economy and we, as inhabitants of Austria, are more familiar with touristic/hotel

figures of that country, we chose Austria, the region of Tyrol and the city of Innsbruck to double check the numbers. What we found was that although Austria only came 25th in the ranking shown in Table 1, with 148 hotel annotations found, we could find 287 hotel annotations in Tyrol, which is part of Austria, and even 63 hotel annotations in Innsbruck, which is the capital city of Tyrol. So the conclusion is that efforts to create hotel annotations in schema.org have gone wrong to a large extent. Obviously the owners of the websites tried to apply schema.org, but have not done it correctly. There is no use for an annotated hotel if there is no country or region in the annotation, and as a result of that wrong usage of annotations we learned that it looks like as if there are more hotels in Tyrol than in Austria.

If we take a look at the annual report of Statistik Austria<sup>15</sup> for the year 2013, we can see that Austria has around 64,000 accommodation providers. Around 23,000, a good third, are located in the region of Tyrol. If we compared that numbers to what we found in the WDC dataset, only 0.23 % of Austrian and 1.2 % of Tyrolean hotels use schema.org annotations.

In the USA, the hotel annotation situation looks quite different. If we take a look at the report of the American Hotel and Lodging Association<sup>16</sup> we can find, that in 2013 there were around 53,000 lodging properties, but over one million hotel annotations.

Comparing that figure with estimations from different touristic websites<sup>17</sup> concerning how many hotels exist around the world (the estimation says around 500,000), we see that only the schema.org annotations located in the USA exceed that number by the factor of 2. Another interesting aspect of this data set was to learn which categories of hotels are either using schema.org on their own, or are annotated by third party websites. For this purpose we inspected the appearance of schema.org/Rating, which aims, due to the documentation,<sup>18</sup> to show the rating on a numerical scale from one to five, as it is done in hotels with the stars rating (\*, . . ., \*\*\*\*\*). In our understanding values with .5, like in 3.5 stars, indicate a higher level hotel, such as for example the \*\*\*Superior rating. But again, the observation is that only about 2.3 million hotel triples make use of the schema.org/Rating class (see also Fig. 1 for details). Analysing the mentioned 2.3 million triples showed a clear tendency of higher rated hotels being annotated more properly and more often, see Table 2 for details.

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<sup>15</sup> <http://www.statistik.at/>

<sup>16</sup> <https://www.ahla.com/content.aspx?id=36332>

<sup>17</sup> <http://www.tnooz.com/article/how-many-hotels-in-the-world-are-there-anyway-booking-com-keeps-adding-them/>

<sup>18</sup> <https://schema.org/Rating>

**Table 2** Distribution of ratings among annotated hotels

Rating	Usage sum	Percentage
5	866,932	36.5 %
4.5	35,079	1.5 %
4	651,606	27.4 %
3.5	66,208	2.8 %
3	426,925	18 %
2.5	15,476	0.6 %
2	176,800	7.4 %
1.5	941	0.03 %
1	135,958	5.7 %

## 4.2 How Is Schema.org Used in the Hotel Domain?

This question will be answered by taking a detailed look at which classes are used when it comes to annotating hotels and which attributes are in use.

To identify which classes and properties are used and how often they appear, we iterated over all hotel triples and all related properties. We grouped those properties by name and counted the appearance. With this method we found 37,192,502 triples directly related to hotel triples. The most frequently used property was `schema.org/Hotel/name`, 5,666,474 times, which is interesting, because there are only about 4.8 million hotel triples. Obviously some hotels were annotated with two or more names. The second most often used property was `schema.org/Hotel/review`, 5,226,132 times, which is not very surprising, because as we will see in Sect. 4.3, a great amount of hotels are annotated with `schema.org` on rating websites. Place three in this ranking is <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>, with 4,841,353 appearances, which is the attribute that tells a triple that it is a hotel—this number of course equals the number of total hotel triples. Overall there are 119 different properties in use which either refer to literals or to classes. To find more details about the top ten used properties see Table 3.

This top ten list gives an interesting insight into how hotels are annotated: almost 30 % of the found hotel triples do not have images associated, almost 40 % do not give an address and more than 60 % do not add a description to the annotation. Even though one would assume that almost all hotels have websites and that a URL is one of the most important properties of a hotel on the web, almost 65 % do not even add a URL. Rank 11 is followed by `schema.org/Hotel/telephone`, more than 70 % of all hotel annotation come without a phone number and only 0.5 % mention an email address.

In the documentation for `schema.org/Hotel` there are 62 properties mentioned from either the `Hotel` class itself or inherited from `LocalBusiness`, `Organization`, `Thing` and `Place`, while our analysis came up with 111 different properties. This again is an indicator that large inaccuracies take place when it comes to annotations. Attributes are written syntactically wrong, for example `makeOffer` instead of `makesOffer` and some properties even get invented out of thin air, like `Hotel/wedding`, `Hotel/telefax` or `Hotel/?description?`. Even though there are almost all

**Table 3** Usage of properties in hotel triples (<http://schema.org/> is shortened to sc: and <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> is shortened to rdf:type)

Property name	Usage sum	Percentage
sc:Hotel/name	5,666,474	117 %
sc:Hotel/review	5,226,132	108 %
rdf:type	4,841,353	100 %
sc:Hotel/image	3,439,579	71.0 %
sc:Hotel/address	3,035,301	62.7 %
sc:Hotel/aggregateRating	2,723,587	56.3 %
sc:Hotel/rating	2,377,406	49.1 %
sc:Hotel/description	1,934,486	40 %
sc:Hotel/url	1,749,830	36.1 %
sc:Hotel/geo	1,323,333	27.3 %

properties of schema.org generally in use, only 8 properties appear in more than 30 % of hotel triples and only 20 of the 62 described properties are used in more than 1 % of the hotel triples. To sum up this question, there is a movement observable towards semantic annotation of hotels but there still is a lot to be done to match a sufficient annotation.

### 4.3 Who Is Using Schema.org in the Hotel Domain?

With this question we wanted to know if it is the individual hotel that uses schema.org most or best to describe its properties, or if it is a third party page which displays and annotates hotels for whatever reason (e.g. for providing the hotel information in order to collect the hotel bookings). After manually browsing through some of the hotels in the data set during the process of the analysis it appeared, by looking at the mentioned fourth column of the NQuad, the data provenance column, only a very small number of hotels showed the own URL as a provenance. The vast majority of the hotels appeared to be annotated by third party websites. So we created a hypothesis which says: “In the hotel domain, schema.org is predominantly used by booking or rating webs sites, barely by hotel web sites themselves”.

The approach we took to prove the derived hypothesis was the following: iterating over all hotel triples found on booking and rating websites which offer a hotel-URL (as hotel-URL `schema.org/Hotel/url` is used) and checking if the hotel web site is schema.org annotated. Further, we use the hotels pay-level domain as a unique identifier and note if a schema.org annotation was found on the hotel web site or not. Finally, we check to see if the specific hotel appears multiple times in the data set, and if so, note on which other web sites and count the appearance. With this method, we get a detailed overview how many hotels use schema.org themselves and which other websites, rating or booking sites use schema.org to annotate hotels.

We did not manage to implement that approach for all hotels yet-this is a matter of further research. We therefore took some of the biggest rating and booking sites

**Table 4** Comparison between 2013 and 2014 dataset

	2013	2014	%	Delta %
Triples	127,484,226	147,997,612	116.1	16.1
# Hotels	4,841,353	6,330,510	130.8	30.8
# Hotels distinct	740,298	567,229	76.6	-23.4
<b>Properties</b>				
Address	3,035,301	3,594,958	118.4	18.4
Street	2,284,000	3,602,000	157.7	57.7
ZIP	2,011,000	3,091,000	153.7	53.7
Region	1,902,000	2,934,000	154.3	54.3
Country	1,904,000	2,442,000	128.2	28.3
CName	1,125,000	1,427,000	126.8	26.8
Name	5,666,474	7,118,000	125.6	25.6
Rating	2,377,406	2,438,004	102.6	2.6
R. Value	2,375,916	2,436,850	102.6	2.6

mentioned on the WDC website<sup>19</sup> and examined them manually. The outcome of this very small sample confirmed our hypothesis fully: most of the hotels found on rating and booking websites do not have their own schema.org annotations on their web sites. It will be very interesting to see what the research on the full data set shows.

#### ***4.4 Is the Use of Schema.org in the Hotel Domain Increasing?***

When comparing the outcome of the analysis of the 2013 and the 2014 datasets, it can be clearly seen that the use of schema.org in the hotel domain has increased.

In the 2013 dataset there were 127 million triples, while in the 2014 dataset there are 148 million triples, which is a growth of 16 %. The 4.8 million annotated hotels from 2013 have increased to 6.3 million in 2014. Properties have also increased: 18 % increase of addresses, 25 % more name properties and 2.5 % more ratings. For more details please see Table 4.

## **5 Conclusion and Future Work**

To conclude this paper, we point out that generally a strong development towards the usage of schema.org can be observed in the hotel domain. Hotels start using annotations to enrich their web sites for more visibility in search engines and to

<sup>19</sup> <http://webdatacommons.org/structureddata/2013-11/stats/stats.html>

power rich snippets. Also, third party web sites such as rating or booking platforms use schema.org more and more: sometimes even too excessively, to increase search engine visibility as well as making their data more visible and useful for other developments, like the usage in mobile apps. But still, especially for the hotel's own web sites, there is a lot more that could and should be done when it comes to annotation. Very often schema.org classes and properties are used incorrectly, some properties are invented by the website developers and often very important classes and properties, for example like URL, telephone number, description or geographic location are totally omitted. An in-depth analysis of errors found in the WDC data set and how to handle has been made by Meusel and Paulheim (2015). It appears that the hotel owners' only concern is to be visible and highly ranked in the web search engines, but they completely ignore what could be made out of their hotels data, if properly annotated, by third party apps like, for example, event platforms or other service or information orientated web sites.

We also want to point out that since May 2015, when schema.org version 2<sup>20</sup> was released, there has been a newly introduced schema.org extensions mechanism enabling extensions for various domains. One other idea for future work we are addressing right now is the creation of such a mentioned schema.org extension for hotels. As we discovered for the hotelery, and this is true for other touristic fields as well, a lot of important information cannot yet be annotated by schema.org: for example how many beds a hotel room has, whether there is a TV or a whirlpool available or not, etc. Extending schema.org with terminology for describing hotels, hotel rooms, amenities and in general any other form of accommodations and their features could really enrich schema.org and make it even more valuable for hotelery and tourism.

Another direction we want to follow in our future work is to try to learn how many hotels have multiple annotations, how many have only one annotation and how many hotels are still unannotated. To work on this we first have to define what a hotel is, or consider any definition concerning hotels, for example made by the World Tourism Organisation (UNWTO). Then it would be necessary to find a reliable study about how many hotels exist worldwide, and if that is not possible, to make an extrapolated approximation based on one or more countries where records on the number of hotels exist. These findings would lead to an interesting insight as to where schema.org is distributed most, and where it is still necessary to work on schema.org annotations.

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<sup>20</sup> <http://schema.org/version/2.0/>



## References

- Cyganiak, R., Harth, A., & Hogan, A. (2008). N-quads: Extending n-triples with context. Technical report, DERI, NUI Galway.
- Fodor, O., & Werthner, H. (2005). Harmonise: a step toward an interoperable e-tourism marketplace. *International Journal of Electronic Commerce*, 9(2), 11–39.
- Hepp, M. (2013). Accommodation ontology language reference. Technical report, Hepp Research GmbH, Innsbruck.
- Jakkilinki, R., Georgievski, M., & Sharda, N. (2007). Connecting destinations with an ontology-based e-tourism planner. *Information and Communication Technologies in Tourism, 2007*, 21–32.
- Khalili, A., & Auer, S. (2013). Wysiwym authoring of structured content based on schema.org. In *Web information systems engineering – WISE 2013* (pp. 425–438). Springer.
- Meusel, R., & Paulheim, H. (2015). Heuristics for fixing common errors in deployed schema.org microdata. In *The semantic web – Latest advances and new domains* (pp. 152–168). Springer.
- Meusel, R., Petrovski, P., & Bizer, C. (2014). The webdatacommons microdata, RDFa and microformat dataset series. In *The semantic web – ISWC 2014* (pp. 277–292). Springer.
- Prud'hommeaux, E., & Seaborne, A. (2008). SPARQL query language for RDF. W3C recommendation, 15.
- Stavarakantonakis, I., Toma, I., Fensel, A., & Fensel, D. (2014). Hotel websites, web 2.0, web 3.0 and online direct marketing: The case of Austria. In *Information and communication technologies in tourism 2014* (pp. 665–677). Springer.
- Toma, I., Stanciu, C., Fensel, A., Stavarakantonakis, I., & Fensel, D. (2014). Improving the online visibility of touristic service providers by using semantic annotations. In *The semantic web: ESWC 2014 satellite events* (pp. 259–262). Springer.
- Zanker, M., Fuchs, M., Seebacher, A., Jessenitschnig, M., & Stromberger, M. (2009). An automated approach for deriving semantic annotations of tourism products based on geospatial information. *Information and Communication Technologies in Tourism, 2009*, 211–221.

# The Role of Destination in Hotels' Online Communications: A Bottom-Up Approach

Elena Marchiori, Fabia Casnati, and Lorenzo Cantoni

**Abstract** Among the various factors leading to the success of a hotel website, there is the provision of information related to a hotel's destination context. Meanwhile, the ability to present destination information on a hotel's website represents a great opportunity for destination discovery. In this context, *outbound* links (i.e., links that point to external resources/sites), favor the creation of a network within a destination. And yet, little research presently delves into the dynamics of outbound links among actors from the same destination. Therefore, the present paper seeks to explain how destination-related outbound links on websites of hotels within the same territory do identify the destination itself; and how linked content promotes said hotels' overall regions. A Swiss destination is used as the subject of an exploratory case study, and a bottom-up, inductive approach is proposed to analyze the role of destinations in hotels' online communication by examining the presence and nature of outbound links. Theoretical and practical implications of such an approach are then proposed.

**Keywords** Tourism destination • Hotels' online communications • Outbound-links • Web marketing • Online network

## 1 Introduction

The concept of a *tourism destination* (TD) does not match specific geo-administrative coordinates but, rather, socially perceived coordinates, which can have different granularity levels: a tourism destination is a complex object that can be considered a social construct based on individual and group emotional thoughts about place (Lawson & Baud-Bovy, 1977). Meanwhile, a tourism destination also consists of a series of services (e.g., transportation, accommodations, entertainment, hospitality, attractions), all of which contribute to a place's identity. In this context, information and communication technologies (ICTs) have led to remarkable developments in recent years, supporting a destination in the promotion

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of its territory. In particular, these changes due to ICTs have also involved hotels, whose website is one of their most important tools for communicating with guests and prospects.

As a hotel is part of a destination, its online behavior represents opportunities to co-create narratives about its surrounding destination. Moreover, among the various factors leading to the success of a hotel website, there is the provision of information related to a hotel's destination context. Indeed, destination information and offers can influence guests' decisions. Meanwhile, the ability to present destination information on a hotel's website represents a great opportunity for destination discovery. Several studies (Chung and Law 2003; Frey, Schegg, & Steiner, 2002; Han & Mills, 2006; Scharl, Wöber, & Bauer, 2004) have confirmed that when information related to a destination is presented on hotel websites, it can help increase location visibility.

The presence of destination-related information on a hotel website can be represented in different forms: (1) a link to the destination-management organization's official website; (2) links connecting the hotel website to the websites of tourist attractions or other operators within the same region; (3) pictures; (4) videos; and (5) simple text descriptions of the destination. As such, links convey relevance and connect a destination's various stakeholders, creating a digital network of related actors (Park & Gretzel, 2007). In fact, this form of hyperlinking, creating *outbound* links (i.e., links that point to other sites), favors the creation of a network within a destination, spurring partnerships, and simultaneously offering online users the chance to investigate aspects of their prospective destinations by psychologically inducing a sense of the proximity of local institutions and attractions mentioned in a website. And yet, little research presently delves into the dynamics of outbound links among actors from the same destination or, in particular, how outbound links are related to place among a specific group of stakeholders, such as the hotels located within the same destination. What's more, such outbound links can represent bridges between a destination's various digital entities. However, as each hotel freely and independently chooses whether to include hyperlinks on its website to other destination-related websites (and how to do so), investigating how outbound links combine to form a destination's overall online image seems to be extremely relevant.

With this in mind, then, the present paper seeks to explain (1) how destination-related outbound links on websites of hotels within the same territory concur to identify the destination itself; and (2) how linked content promotes said hotels' overall regions. To this end, the Swiss destination Ticino, located in southern Switzerland, is used as the subject of a exploratory case study. A bottom-up, inductive approach is proposed to analyze the role of destinations in hotels' online communication by examining the role of outbound links. Specifically, websites of hotels in Ticino are reviewed to identify the nature of destination-related outbound links.

Results show hotels in the region consistently communicate details about the entirety of their destination context, including nearby regions. Moreover, the present study's results also suggest that a bottom-up approach to analyzing hotels'

destination-related outbound links can give a destination manager a more comprehensive understanding of how her destination is portrayed in the digital marketplace by specific groups of stakeholders (in this case: hotels). And this, consequently, can help DMOs plan more effective web strategies and harmonize online communications from an overall network perspective, thereby attracting prospective travelers and promoting destinations' perceived value.

## 2 Literature Review

### 2.1 *Destination Networking*

Recently, Ying, Norman, and Zhou (2014) posited that understanding how tourism operators from the same region are connected via the web could shed light on how their communications take place online and how they develop networking strategies. Moreover, results from their study revealed that investigating digital networking dynamics for a destination can help the local tourism industry optimize its region's business-to-consumer (B2C) communications and business-to-business (B2B) collaboration and cooperation. The tourism industry, given its fragmented nature, embraces a system of relations between businesses and organizations that is divided into specific destinations or territories (Scott, Baggio, & Cooper, 2008). According to Wang and Xiang (2007), the majority of tourism businesses are small- and medium-size organizations with limited resources. Consequently, developing cooperation, partnerships, and networks between organizations is important for their survival. Baggio, Scott, and Cooper (2010) advance the idea that destination-stakeholder networking is useful in identifying strategic opportunities for cooperation and collaboration among destination actors. Moreover, as Baggio et al. (2010) assert, analyzing the interactions of such organizations within a destination's "cyberspace" is crucial to understanding that destination's online network. Obviously, websites are virtual projections of social entities, much like signs, pamphlets, and other marketing materials. But, whereas collaboration was greatly hindered by costs, awareness, time, and space before the internet, today's social entities can be easily connected to each other online via hyperlinks, making the exchange of information and maintenance of collaborative relationships (Ying, Norman, & Zhou, 2014) easier than ever. Hyperlinks can indicate associations between single web pages or whole websites. Furthermore, they are used for specific communication purposes (Ying et al., 2014), and they can help lend websites authority and credibility, while creating relationships among various online actors (Ackland, Gibson, Lusoli, & Ward, 2010). Ackland et al. (2010) have identified the following main characteristics of hyperlinks:

1. They provide information; their basic function is to link one source of information to another.

2. They build and strengthen networks and establish connections and associations between social and political actors, reflecting existing networks or building new ones.
3. They build or strengthen online presences through link replication and sharing.
4. They facilitate public sharing and the rapid introduction of web users to new websites.
5. They intensify the reach and scope of online messaging; highly self-referential hyperlinks between groups sharing the same links can enlarge messages' presence on the web, making these messages more visible to outside users.

Analyzing hyperlink dynamics is therefore a useful means of investigating social-networking and communications' functions and a lens through which to understand individuals' and organizations' interactions (Park and Thelwall, 2003). Given the wide range of communications and organizational functions hyperlinks can perform, examining their applications in tourism can provide interesting insights into the relationships between different players within the industry. Specifically, investigating how hyperlinks help to present destination information on the websites of hotels in the same region can shed light on how hotels identify, represent, and promote their shared destination, and can aid in delineating the relationships between said hotels and DMO regional and local attractions, activities, organizations, and events.

## 2.2 *Push and Pull Strategies for Online Promotion*

Destination-focused online communications can come in different forms: websites, search-engine ads, mobile applications, virtual-reality media, social-networking outreach, "eWord of mouth", etc. Such promotional behaviors can be classified either as *pushing* a message toward a specific audience, or as *pulling*: when a recipient is actively seeking specific information and "pulls" it toward herself (Inversini & Cantoni, 2014). Particularly important for a tourism destination, though, is maintaining its online reputation (i.e., knowing what is said about it online by whom where and how, as well as ensuring that the majority of commentaries is positive) (Marchiori & Cantoni, 2012). And equally important is online promotion aimed at optimizing website rankings within organic search results, this last practice is called *search-engine optimization* (SEO). The mechanics of this system work such that Google, for example, assigns a numeric value to each uniform resource identifier (URL), or the "Web address" of a particular web page, in order to quantify its importance (i.e., page rank). The ranking of a given web page within the search engine's results is not only a product of intrinsic factors (its relevance for the entered keywords), but depends also on the number and quality of inbound links (backlinks) to the page from other websites.

Thus, having a network of quality backlinks to a website is increasingly important to businesses, especially in the tourism and hospitality industries, as this

ensures exposure online (Wang & Xiang, 2007). Sponsored search-engine ads place links to companies' websites at the top of search results for specific terms when users enter those keywords. Companies pay for this service, and the practice of strategically doing so is called *search-engine marketing* (SEM).

### 2.3 *The Relevance of a Backlink Strategy in Online Promotions*

PageRank utilizes "link popularity" as extrinsic indicator of a page's importance. To understand this concept better, we can compare link popularity "to a kind of implicit vote: every incoming link to a website is interpreted as a vote. Thus, the more backlinks there are, the greater the value of the site is" (Inversini & Cantoni, 2014, pp. 135–136). For a website to be deemed important it must have the highest number of quality backlinks and be associated with other high-quality pages also relevant for its intended audience. Back-linking, meanwhile, transactions can fall under three headers:

1. **Free.** The backlink is created for free upon request; this is usually done by personal sites or blog.
2. **Exchanged.** The backlink is been created upon request in exchange for a reciprocal link; this strategy can be applied when the involved websites derive mutual benefit from each other's links as they are not direct competitors, and the number of visitors funneled from one site to the other is balanced.
3. **Paid.** The backlink is created in a specific space on a website in exchange for payment.

To implement a backlink campaign one must first define the network of websites where to put backlinks. This can be done by entering keywords characterizing a company or organization into the various search engines, or by subscribing to Alexa.com (option: *Related Links*) or SEOLogos.com (option: *Backlink Analysis Tool*). Such tools help their subscribers identify websites similar to the subscribers' websites. After determining which websites should host a link to one's business, the next step is to establish the transaction type for each. Finally, the optimizer/marketer must constantly monitor the business's online context, as new, relevant actors can appear overnight.

### 3 Research Design

#### 3.1 Sample

The Swiss destination Ticino (in southern Switzerland) is the subject of the present case study. Ticino comprises an area of 2812 km<sup>2</sup> (1086 square miles), and traveling by car from its southern to northern points takes approximately 1 h and 15 min. Generally, public transportation in Ticino is efficient and well integrated into the territory's infrastructure. Consequently, reaching points of interest in the region is relatively easy for tourists, who can travel across Ticino several times in a day. Given the small size of the region, Ticino's DMO at the cantonal level promotes it as a destination unto itself. However, Ticino Tourism is administratively divided into four districts: Locarno, Lugano, Bellinzona, and Mendrisiotto, connected with the four major cities in the canton. It is therefore in the interest of each region to promote itself individually.

For all these reasons Ticino is an interesting subject for a case study on how hotels in small regions promote their surrounding destination(s). Data for this study was collected in March 2014. First, a list of Ticino hotels was compiled by searching TripAdvisor.com for the keyword "Ticino hotel." There were 192 results for this search, but 31 hotels were excluded from the sample, as 21 had no websites, four were double links, five were no longer in business, and one had a website that was under construction. The final sample therefore consisted of 161 websites of hotels in the Ticino region. Subsequently, a researcher examined the content of each hotel's website, and all content pertaining to the wider Ticino region was collected (see Fig. 1). Then, a bottom-up, inductive approach was taken and included both the creation of topic categories and an analysis of each website's content.



**Fig. 1** One of the hotel websites analyzed: typologies of both the present study's analysis objectives and destination-related content are circled

Next, taking a saturation approach, each piece of destination-related content was classified according to ad-hoc produced categories until every piece of content had been categorized. This allowed the present study's authors to perform a custom analysis and precisely map out topics associated with the destination. To ensure reliability, a random sampling of the hotel websites was performed by a second researcher. The reliability of the two researchers' respective judgments was calculated using ReCal2 (<http://dfreelon.org/utills/recalfront/recal2/>), yielding a Krippendorff's alpha value greater than 0.90 and, therefore, showing there was a high degree of agreement between the researchers' judgments (Lombard, Snyder-Duch, & Campanella, 2010).

Once all available destination-related content was collected, an in-depth analysis of how hotels defined their context has been done. To determine the geographical location of a link, the coder had to (1) open the link and (2) geo-locate the business, attraction, or event referenced. In this way, outbound links were associated with specific local destinations in Ticino (according to the Canton's four districts), or with Ticino at the regional level, or Switzerland at the national level.

## 4 Results

The study of hotel websites ( $n = 161$ ) revealed that 139 websites (corresponding to 86.5 % of the analyzed sample) contained destination-related information, while 22 hotel websites did not contain destination-related information. Among the hotel websites that contained destination-related information, 121 presented the information as a section in their main menus, and nine presented it as a subsection (i.e., in second level of navigation). Furthermore, 115 of the websites presented a list of outbound links within these sections, while nine ones presented destination-related information as outbound links on their home pages.

The label most frequently used to name these destination-related sections and outbound links was (1) "links," followed by "events," a given attraction's name, "golf," "excursions," "activities," "region," and "leisure." Destination-related information was mainly presented on hotel websites as outbound links. Indeed, 124 websites (89.2 %) presented at least one hyperlink to a destination's website. Pictures related to Ticino in 74.1 % of the sampled websites, and 71.9 % ( $n = 100$ ) of the sampled websites contained a textual description of the region. Only 11.5 % ( $n = 16$ ) contained one or more destination-related videos.

### 4.1 *Mapping Destination Boundaries Using an Outbound-Link Analysis*

124 of the sampled websites contained at least one destination-related outbound link, and 1095 destination-related outbound links were found, for an average of 8.7



**Table 1** Outbound links distribution among the four districts of the Ticino region

	Ticino hotel websites mentioning destination-related info ( $n = 124$ )	District level			
		Locarno hotel websites ( $n = 62$ )	Lugano hotel websites ( $n = 46$ )	Bellinzona hotel websites ( $n = 11$ )	Mendrisio hotel websites ( $n = 5$ )
No. of hotels for each star category	Total 5star: 10	5star: 4	5star: 6	5star: –	5star: –
	Total 4star: 20	4star: 11	4star: 9	4star: –	4star: –
	Total 3star: 64	3star: 33	3star: 20	3star: 7	3star: 4
	Total 2star: 27	2star: 12	2star: 10	2star: 4	2star: 1
	Total Other: 3	Other: 2	Other: 1	Other: –	Other: –
Total number of outbound links	Total outbound: 1095, divided as: 5star: 95 4star: 174 3star: 654 2star: 162 Other: 10	623	314	98	60
Avg. no. of outbound links per hotel	8.7	10	6.8	8.9	12

outbound links per hotel. As mentioned above, each outbound link was analyzed to identify its location and the typology it belonged to. Table 1 shows how the smallest district, Mendrisio (containing only five of the analyzed hotels) accounted for more outbound links, on average, per hotel ( $n = 12$ ). This suggests that hotels in this small district feel a need to show their connection with the rest of Ticino.

An in-depth analysis of the hotels based on star ratings revealed that five-star hotels' websites had on average 9.5 destination-related outbound links; three-star hotels' websites had an average of 10.2; four-star hotels' websites had an average of 8.7; and two-star hotels' websites had an average of 6. These results suggest that luxury and three-star hotels tend to incorporate destination-related information in the form of outbound links into their website content extensively.

As for the 1095 destination-related outbound links found, they linked to 297 different websites, and the present study's authors classified each as belonging to 1 of 10 topic categories (see Table 2). Most of these links linked to destination-related websites (e.g., national, regional, district, and local DMOs). Only five websites (1.6 % of the sample) were linked to district-specific websites for all of Ticino's districts. The linked websites were, in descending order of frequency, Switzerland's national DMO, Ticino's regional DMO, the Lugano district's DMO, and the websites for two natural attractions, one in Bellinzona and one in Mendrisio. Only 19 of the linked websites back-linked at least one hotel from the four districts, and these were mostly natural attractions, transportation-service, and local-DMO websites. Moreover, 64.3 % of the studied websites linked only to one destination-related website.

**Table 2** Topic categories distribution emerged from the outbound-links analysis

Topic categories	Destination-related website	No. of outbound links
Destination websites (e.g., national, regional, district, and local)	56	384
Attractions at the destination	42	72
Events	51	125
Paid attractions	35	163
Nature-related attractions	32	105
Activities (paid)	32	79
Transportation	16	47
Museums	18	77
Outside Ticino	11	34
Weather	4	9
Total	297	1095

As shown in Fig. 2, outbound-links to Switzerland's national DMO website counted on average less than 20 % of outbound links' instances. A similar situation has been noticed also for links led to region-related websites. These results suggest that the hotels were less focused on linking to national (even a dedicated section of the national website focused on promoting Ticino) and regional websites. This, then, suggests room for improvement, in particular in terms of regional institutions providing support—such as coordinating joint online communication—to hotels, thereby promoting attractions within the same region and ensuring consistent co-creation of tourism messages with regards to the overall destination.

An in-depth analysis of the outbound links to websites for attractions within the same region and to those of attractions in other regions revealed that hotels in all four districts linked mainly to tourism-related websites in their own districts. This suggests that hotels from small districts tend to promote attractions closest to their locations, instead of promoting the region's overall brand. Additionally, hotels under such conditions appear to be more sensitive to increased business at the local level. Indeed, linking (and connecting) other businesses far from a hotel's location might be perceived as a threat, as a prospective tourist might discover that the other area is more worth visiting, and might change her booking to another hotel. Figure 3 depicts the main tourism related attractions of each district gathered from the hotels' outbound-links from the same districts.

Results show that the main tourism attractions for the Locarno district are related to events and nature-related attraction, while for the Lugano district where nature-related attractions and a specific attraction at destination which is Swissminiatur. Bellinzona was mainly promoted for its attractions at the destination (villages and a funicular), and for its main nature-related attraction, represented by a mountain. Mendrisiotto district was instead promoted for a mountain as main nature-related attraction and for a shopping center, depicted as the main attraction at the destination.

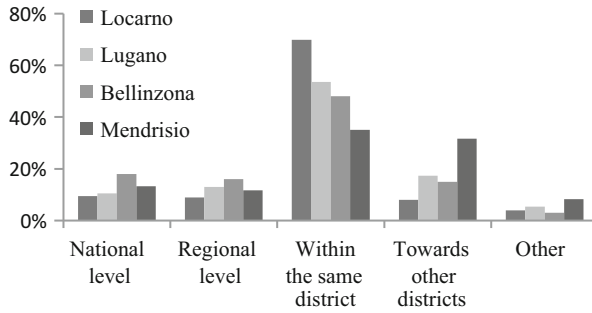


Fig. 2 Outbound-link distribution according to geographical boundaries



Fig. 3 Main tourism-related attractions per each district within the Ticino region

Finally, an analysis of outbound links to other regions also presents interesting insights in order to map a destination’s attractiveness to tourists from a hotel perspective. Figure 4 shows how hotels in each region tend to link to attractions in other regions.

Only one region, Lugano, received links from all three other regions. Mendrisiotto region tends to link only Lugano (which is the closest district). A similar situation has been found for Bellinzona, which connects Lugano and Locarno districts; while Lugano connects Bellinzona and Mendrisiotto districts.

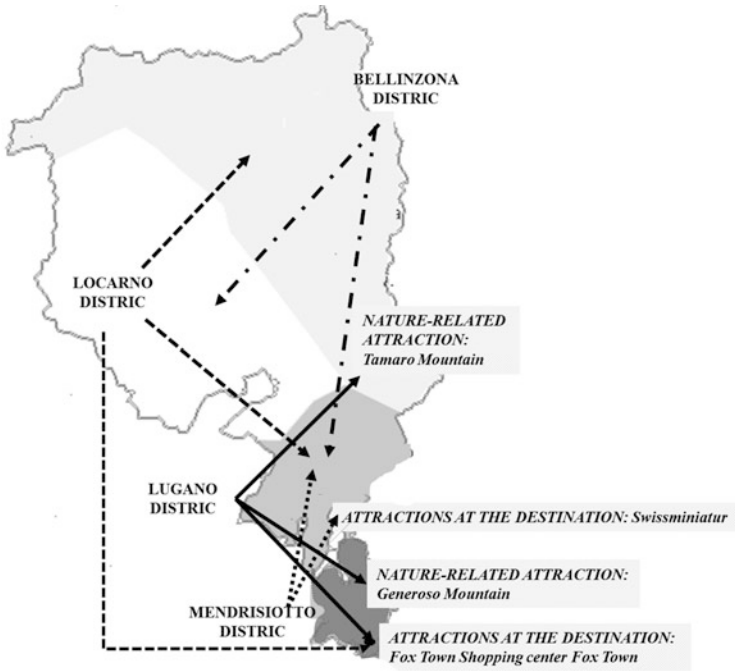


Fig. 4 Map of outbound links across districts within the Ticino region

Locarno district tends to link all other regions, but receives backlinks only from Bellinzona. Moreover, from this analysis it was possible to identify the main tourism related attractions, which received more links: two nature-related attractions (e.g. mountains), and two other attractions, namely Swissminiatur, and a shopping center. These results seem particularly relevant when it comes to crafting official messaging for regional and local DMOs. Indeed, on the current Ticino's own official website, there isn't such distribution of tourism-related attractions. Indeed, Locarno and Mendrisio are depicted as nature-related destination, while the former, according to the hotels perspective, offers many event-related attractions, and Mendrisiotto appeared to be popular for shopping-related attractions. Furthermore, considering that the Ticino region hosts two Unesco World Heritage Sites (in Bellinzona and Mendrisiotto districts), and those attractions did not emerge from the analysis, it is suggested for the regional DMO to perform such in-depth analysis in order to balance potential missing or biased information.

## 5 Conclusion

The present study's results have shown how a bottom-up approach can be used to investigate the still widely misunderstood role a destination plays in hotels' online communications. It also demonstrates that outbound-link analysis can show how

different districts within the same region identify with their surroundings, and how they promote other areas within the same region. Moreover, quantitative outbound-link analyses should prove helpful to DMOs, as they can aid in identifying where promotional efforts should be concentrated and can be used to improve communication and collaboration within an overall district. Indeed, a bottom-up approach can reveal potential shortfalls in the information exchanged within the same region, and which attractions could be better promoted. Knowing how hotels from a small region depict their context might also reveal what attractions are considered most worthwhile and might help their DMO promote these across its districts. This is particularly relevant, as better promotional strategies for the overall region and districts' specific characteristics might inspire prospective travelers to extend their stay. Overall, it has to be considered that findings from this study cannot be generalized as they refer to a single case study. However, insights from the analysis of outbound links of a specific region of Switzerland allowed to posit the evidence for further investigations on this particular web-marketing practice. Future research should therefore enlarge the sample in order to verify if the district-region dynamics are recurrent, and also which destination-related attractions are in general perceived more appealing for hotels in their online communication. There are also some limitations associated with the present study. First, case studies, such as that presented herein, are time-consuming, as they require human researchers analyze all available websites for hotels in a region, then examine their destination-related outbound links. That said, as hotel websites do not change their content frequently, a destination manager might perform such an analysis over a relatively extended period. And, if anything, future research in this vein might provide tools that help automate data collection and topic and location identification. Another limitation is that in-depth analysis in the present study was focused only on outbound links. Future research might focus on destination-related images and videos on hotel websites to discover if their messages differ from those presented through outbound linking. Likewise, website analytics for regional DMOs might be compared to identify relevant backlinks and whether hotels are contributing a substantial part of their visitors through their outbound-links. Moreover, a larger sample is needed in order to confront hotels from different categories, and verify patterns among them. Finally, the role that destination information on hotel websites plays in influencing prospective tourists could be further investigated. By doing so, future studies might verify which destination information attracts the most attention, whether a particular piece of information has a real impact on prospective visitors' decision-making in booking a hotel, and overall if hotels that sell their destinations do better in terms of overall performance. This would certainly prove crucial in investigating what is the relevance of such information to promote the linked businesses, and what level of destination awareness is generated by such links.

In summary, this study sought to contribute to marketing analysis and search engine optimization theory in current tourism literature and to provide, in examining the specific strategies associated with outbound linking, evidence of these practices' efficacy using a qualitative, bottom-up approach. This study also has practical implications inasmuch as DMOs can perform backlink analyses using

their own website analytics tools. However, as this study reveals, a better practice might be for DMOs to analyze the markets for their destinations and devise ways they can collaborate with their districts' hotels in crafting tourism-related messages. Lastly, examining links in common among similar businesses would allow DMOs to identify links hub and, in turn, determine where their online presences succeed and fail to provide adequate information on the entire tourism-activity map of their regions' products and services.

## References

- Ackland, R., Gibson, R., Lusoli, W., & Ward, S. (2010). Engaging with the public? Assessing the online presence and communication practices of the nanotechnology industry. *Social Science Computer Review*, 28(4), 443–465.
- Baggio, R., Scott, N., & Cooper, C. (2010). Network science: A review with a focus on tourism. *Annals of Tourism Research*, 37(3), 802–827.
- Chung, T., & Law, R. (2003). Developing a performance indicator for hotel websites. *International Journal of Hospitality Management*, 22(1), 119–125.
- Frey, S., Schegg, R., & Steiner, T. (2002). Benchmarking internet use for the marketing of Swiss hotels. *Information Technology and Tourism*, 5, 73–89.
- Han, J., & Mills, J. E. (2006). Zero acquaintance benchmarking at travel destination websites: What is the first impression that national tourism organizations try to make? *International Journal of Tourism Research*, 8, 405–430.
- Inversini, A., & Cantoni, L. (2014). *Nuovi media nella comunicazione turistica*. Roma: Dante Alighieri.
- Lawson, F., & Baud-Bovy, M. (1977). *Tourism and recreational development*. London: Architectural Press.
- Lombard, M., Snyder-Duch, J., & Campanella C. (2010). *Practical resources for assessing and reporting intercoder reliability in content analysis research projects*. <http://matthewlombard.com/reliability/>
- Marchiori, E., & Cantoni, L. (2012). The online reputation construct: Does it matter for the tourism domain? *Journal of Information Technology and Tourism*, 13(3), 139–159.
- Park, Y. A., & Gretzel, U. (2007). Success factors for destination marketing web sites: A qualitative meta-analysis. *Journal of Travel Research*, 46(1), 46–63.
- Park, H. W., & Thelwall, M. (2003). Hyperlink analyses of the World Wide Web: A review. *Journal of Computer-Mediated Communication*, 8. doi: 10.1111/j.1083-6101.2003.tb00223.x
- Scharl, A., Wöber, K. W., & Bauer, C. (2004). An integrated approach to measure website effectiveness in the European hotel industry. *Information Technology and Tourism*, 6, 257–271.
- Scott, N., Baggio, R., & Cooper, C. (2008). *Network analysis and tourism: From theory to practice*. Clevedon: Channel View.
- Wang, Y., & Xiang, Z. (2007). Toward a theoretical framework of collaborative destination marketing. *Journal of Travel Research*, 46, 75–85.
- Ying, T., Norman, W. C., & Zhou, Y. (2014). Online networking in the tourism industry: A webometrics and hyperlink network analysis. *Journal of Travel Research*, 55(1), 16–33.

# The Co-creation Process of the Online Image of an Italian World Heritage Site: The Sassi of Matera

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and Lorenzo Cantoni

**Abstract** This paper investigates the co-creation process of the online image of the Italian World Heritage Site “Sassi of Matera”, which has been inscribed among UNESCO World Heritage Sites in 1993. Despite the recent increasing success of the destination, Matera still lacks a strong online communication. To date, the Sassi of Matera have not a dedicated website for the promotion of the UNESCO heritage itself, while other online stakeholders are co-creating its online communication. The case study has been examined to provide an example of how the main stakeholders of a destination can contribute to the co-creation of its online image: hospitality industry, destination players, and user generated content (UGC) through the online word-of-mouth. Content analysis has been performed, revealing the main arguments expressed about the site, and the coverage of the UNESCO label among the concerned online publishers. The theoretical and managerial implications are discussed in the study.

**Keywords** Italian UNESCO World Heritage Sites • Online communication • Sassi of Matera • Co-creation • Online reputation • User generated content

## 1 Introduction

Until three decades ago, destinations were primarily promoted on traditional channels such as newspapers, brochures, television and radio. With the advent of Internet, marketing and promotional efforts are moving more and more to the online domain (Buhalis & Law, 2008; Choi, Lehto, & O’Leary, 2007; Gretzel, Fesenmaier, Formica, & O’Leary, 2006; Law, Leung, & Buhalis, 2008). In this context, in order to achieve a sustained competitive advantage, tourism destinations

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need to be particularly active and updated in the online environment as several online stakeholders are co-creating narratives and provide information about them. World Heritage Sites (WHSs) which, according to the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage signed in 1972, are cultural and/or natural heritage of Outstanding Universal Value, are also becoming more sensitive to the online context in the way people learn about them, and share/promote their values. WHSs are destinations and, as such, deserve the same treatment of all the other tourism destinations, rather much more attention and preservation. Therefore, literature and research conducted for tourism destinations could be also related to sites that have been recognized of worldwide importance. Indeed, while the protection and conservation of heritage are of utmost importance for WHSs, also its presentation—intended as promotion to publics—is included among the objectives of UNESCO's Convention (articles 4–6, 13, 22–24, 26). Digital technologies can be an instrument to inform and communicate with tourists, they might also raise their awareness towards WHSs by inducing them to behave in a more responsible and sustainable way. Accordingly, UNESCO WHSs should be actively promoted on the web by communicating their values and assessing how they are perceived. This embraces their twofold role: both to protect and to present the heritage itself.

Although the use of the web and social media are essential in the online promotion, there is still a lack of research and of related implementation of these marketing tools applied to World Heritage sites. Therefore, this study investigates the co-creation process of the online image of a World Heritage Site located in Italy: the “Sassi of Matera”, declared UNESCO WHS in 1993. The Sassi of Matera have been selected as a case study as they represent a vivid example of a successful WHS that has increased, after the designation, its local tourism. However, even if the Sassi of Matera are a world recognized tourism destination, they suffer from a lack of proper institutional tourism-related online communication. In fact, the site has not a dedicated website for the promotion of the UNESCO heritage itself, and other online stakeholders (i.e.: institutional destination websites, hotel and B&B websites, and so-called eWord-of-Mouth), which are actually co-creating their online communication, apparently cover this role. The paper sheds light on the case of Sassi of Matera, taken as an example in order to understand how all online players interested in a destination can contribute to the co-creation of its online image. Three research phases have been designed, corresponding to the three main stakeholders in the today online arena: hospitality industry, destination players, and user-generated contents (UGCs); for the latter ones, online travel reviews published on the very popular social media platform TripAdvisor.com have been considered. Theoretical and practical implications are then discussed in the paper.



## 2 Literature Review

### 2.1 *Information and Communication Technologies and Sustainable Tourism*

Information and Communication Technologies (ICTs) are nowadays affecting both tourism experience and the related industry (Buhalis & Law, 2008; Law et al., 2008). A research by Gretzel et al. (2006) has studied the information and communication needs of Internet users in the three stages of the tourism experience—before, during and after the stay. An increased use of technology during all stages of a trip implies that travelers are not only more informed about what they are going to experience, but also more engaged (Gretzel et al., 2006). ICTs have also a great potential in order to promote sustainable tourism because they might function as an awareness raising tool, good for the mitigation of some tourism's negative impacts, and able to make people more conscious of their behavior (Ali & Frew, 2013; Schieder, Adukaite, & Cantoni, 2014). A continuous tension between protection/conservation vs. presentation needs has to be somehow solved or, at least, balanced. ICTs can be for sure part of the solution. As in Cantoni (2013), there are five main areas of collaboration between ICT and tourism: (1) Widen Access; (2) Enrich Visit Experience; (3) Increase Ownership And Promote Interpersonal Encounters; (4) -Dis-Intermediate (Some) Relationships; (5) Upgrade Knowledge/Skills. In the tourism domain, this progress in the field of ICTs has strongly enhanced the co-creation of experiences (Tussyadiah & Fesenmaier, 2007, 2009; Tussyadiah & Zach, 2012), going much beyond a simple information retrieval by official websites. Tourists themselves become the creators of their experience by taking an active role and sharing online their experiences and opinions.

### 2.2 *Co-creation of Tourism-Related Experiences*

Pine and Gilmore (1999) introduced the concept of the “experience economy” maintaining that the simple production of goods and services was no more enough, and that the means through which create value for the customers are nothing else than the experiences themselves offered to people. Until then, the usual view was that value creation already happens inside the company and that the production of the final output represents the end of the consumer experience. This was called the good-dominant (G-D) logic. On the contrary, in the service-dominant (S-D) logic co-creation experiences are considered the driving force for value creation (De Jager, 2009; Vargo & Lusch, 2008). Tourism is indeed the industry where experiences play a primary role; only a dynamic involvement of the tourist will bring to a deeper experience and, as the S-D logic states, to a higher value (De Jager, 2009). As said before, today's tourists are looking for tailored experiences, unique events, personalization of the activities, hand-made involvement,

lively and active participation in the daily initiatives, creative exhibitions and manifestations (Gross & Brown, 2006). In this context, modern users go beyond the traditional static search for information, turning themselves into new producers of contents. From this attitude, users become co-creators of contents and work alongside the official information sources, sometimes even overtaking them. According to this view, the destination is at the same time produced and consumed. This means that tourists pre-build an image of the destination in their mind even if they have never been there. Thus, today's hard task of DMOs is not to sell or advertise their products and services, but to listen and monitor what is said about them, both online and offline (Marchiori & Cantoni, 2012). The role of ICTs as a facilitator of this co-creation process will enhance the development of sustainable strategies from the firms' side, and will create memorable and valuable experiences from the tourists' side. There is evidence that tourism experiences are therefore increasingly enabled by technology, see for instance the so-called concept of Technology-Enabled Enhanced Tourist Experiences illustrated by Neuhofer, Buhalis, and Ladkin (2013). The authors emphasize the previous concept (Gretzel et al., 2006) according to which ICTs support and enhance the co-creation of tourism experiences during all the three stages of travel: before, on-site and after. Moreover, they state that this engagement in the co-creation may involve different players: consumers, suppliers and 'virtual' friends via social networks, too (Neuhofer et al., 2013). An important aspect contributing to the process of tourism co-creation is the electronic word-of-mouth (eWOM). Nowadays, tourists do not only rely on official channels, but are more and more influenced by opinions of other tourists (Kim, Limb, & Brymer, 2015). The so-called testimony of others, that is the perceived expertise of people who already experienced a tourism product, is an element people trust and consider in their travel decision-making (De Ascaniis, Gretzel, & Mistilis, 2012; De Capua & Dunham, 1993). Consequently, also the image of the destination is being constantly co-created in the online domain because of the spreading of UGC, which enables the previously mentioned eWOM. In this field, the most accessible and influential source of information are the Online Travel Reviews (OTR), thanks to their ease of access and richness of contributions.

### ***2.3 Online Travel Reviews***

In the Online Travel Reviews (OTRs) context, Destination Reviews represent a part of the tourism reviews available online and are the ones generally related to experiences at/description of tourism destinations. OTRs are a real argumentative textual genre, which deserves to be studied as a communicative event able to strongly influence travelers' choices. De Ascaniis and Gretzel (2013) examined OTR as communicative acts and studied all the characteristics of online texts. There are many platforms for travel reviews, among them TripAdvisor is the most popular and well-known. It has the highest ranking in search engines and supplies the biggest amount of travel reviews in the tourism sector. A corpus of OTR published

on TripAdvisor, referring to an Italian WHS, will be analyzed in the case study of this research, in order to see what is said about a destination from tourists themselves. Here the destination reputation concept comes into play. Even destinations have a reputation, i.e. “*opinion shared among a group of stakeholders*” (Marchiori & Cantoni, 2012; De Ascaniis, Tritto, & Adukaite, 2014), which can, in turn, affects the decision making process (Mariani, Baggio, Buhalis, & Longhi, 2014). Therefore, it can be argued that tourism destination reputation is built and shared online through UGC. Hence, in the today digital world destination managers should acknowledge this situation and be good at listening whatever is said about their destination on the web, in order to be competitive and able to attract new visitors.

### 3 Research Design

The online communication of a WHS is not only performed through the official sources, that are the institutional official websites (UNESCO, 2013). Today every destination might prove to have a reputation on the web, which can in turn affect the decision making process related to it. For this reason, every site manager should monitor this aspect and properly manage what is being said about the property online. In fact, the online image of a WHS is not only strictly connected and enclosed in its official website, but it is actually co-created by a number of other stakeholders in the online context. The inspection of what is said about the WHS outside its official channel and how the UNESCO value is communicated on other websites can provide precious information to site managers, useful for a better management of the property itself. This is the reason why it has been decided to adopt an *ad-hoc* in-depth analysis to study this process, close to some of the main online “unofficial” voices talking about a WHS. In order to give an empirical evidence of this WHS image co-creation process, the authors have decided to examine one WHS, the “Sassi of Matera”. However, the following analysis can be carried out and replicated for any other WHS.

#### 3.1 *The Case of the Sassi of Matera*

For many years the “Sassi” of Matera were considered an area of poverty and depopulation, and they remained in a state of neglect and abandon since in 1993, it was recognized a WHS by UNESCO. An official re-evaluation of the site has been reached on the 17th October, 2014, when Matera has been awarded as European Capital of Culture 2019. However, despite the increasing success of the destination in attracting tourists, Matera as a tourism destination still lacks of a consistent online communication. To date, there is no institutional website acting as an official tourist destination website, apart the municipality website section dedicated to the tourism issue. As regards its WHS status, it also lacks a website specifically devoted

to the heritage. A myriad of websites studs the online world about Matera and its “Sassi”, but almost all of them are managed by private actors, organizations and associations. Since it does not exist an official UNESCO website dedicated exclusively to the WHS of Matera, it is interesting to find out which is the actual online image that different online stakeholders transmit about the WHS of Sassi of Matera. Thus, the analysis covers the “Sassi of Matera” online presence, which is the initial main component of the WHS. This study is not considering a part of “Sassi of Matera” heritage, which is “Park of the Rupestrian Churches of Matera”, heritage added to the UNESCO designation only at a later stage. Therefore, having this theoretical and empirical context, the following research questions have been formulated: even though Matera World Heritage does not provide an institutional WHS website, how Matera World Heritage is communicated on the web? How much the online image of the WHS of Sassi of Matera is being co-created by different online stakeholders?

In order to answer to these questions, the following three phases have been designed, corresponding to the investigation of the online communication performed by the three main online stakeholders (destination, hospitality and user-generated contents perspectives).

### ***3.2 Phase A: Online Representation of the WHS from the DESTINATION Perspective***

It has been analyzed the presence of the UNESCO mention on the websites generally dealing with Sassi of Matera for categories such as small and medium enterprises, institutions, transportation, DMOs, magazines, private companies and public authorities. The data were collected in January 2015 by searching the following keywords on Google.it search engine: “*Sassi di Matera UNESCO*” and “*Sassi Matera*”. The analysis has been done also by searching from abroad information about Sassi of Matera on the search engine Google.com, using the following keywords: “*Sassi of Matera*” and “*Visit Sassi of Matera*”.

For each of the above-mentioned keywords the first three pages of results have been analyzed and a final list of 59 websites was outlined, by removing websites from the list every time they were found more than once in the results, so that to avoid duplicated results (even in cases where it was the same website, but appearing both in Italian and English version). All the websites belonging to the destination (apart the hospitality ones, which will be examined in the next phase) have been taken into consideration. In total, 59 websites (eliminating copies) were taken as sample.

### ***3.3 Phase B: Online Representation of the WHS from the HOSPITALITY Perspective***

It has been analyzed if, and in which section, websites of Matera accommodation (i.e. hotel and BandB websites) contain the piece of information related to the UNESCO heritage. Do Matera accommodation's websites give the information about the WHS label? Is this piece of information communicated in the home page? The analysis has been run starting from the database of hotels and BandBs present on TripAdvisor website on January 2015. The list taken as sample for the analysis includes 119 accommodation (24 hotels and 95 BandBs). The website of each accommodation, if existing, has been investigated in order to find the UNESCO piece of information.

### ***3.4 Phase C: Online Representation of the WHS from the UGC Perspective***

Since the Online Travel Reviews are the most accessible and relevant form of UGC (Yoo and Gretzel, 2008), an analysis of some recent travel comments related to Sassi of Matera has been done. By means of this analysis, the authors aim at discovering how much the Online Travel Reviews can affect the perceived image of the destination Matera and how important can be the UGC 'listening' to improve tourism management practices. This phase has been carried out through a content analysis of comments tourists have written about the destination on the most popular OTR platform, that is TripAdvisor. The collection of the corpus of the comments which have been used for the analysis has followed these steps: (1) browse the [www.tripadvisor.com](http://www.tripadvisor.com) homepage; (2) select "Destinations" option in the search bar and type "Matera", then click on "Find destinations"; (3) click on "Attractions" on the right column; (4) enter in the "Sassi di Matera" section, corresponding to the first result of the search, that is the attraction n. 1 in the destination; (5) put the option "Any" in the Language box of the comments. In total, 420 travel reviews published on TripAdvisor have been analyzed. The comments have been collected going backwards from 08/12/2014 to 21/08/2014, until reaching 20 % of the totality of comments in any language available at that time in the website. The analysis was performed using UAM Corpus Tool version 3.1.14, a free software for text annotation and analysis. This software allows examining and working on a corpus of texts that the user uploads. For the analysis, a corpus of 420 reviews was uploaded. It deals with a tool which not only gives the possibility to annotate and explore text features, but it also provides statistical functionalities for the analysis of documents.

## 4 Results

### 4.1 *Results of Phase A: Online Representation of the WHS from the DESTINATION Perspective*

The results demonstrate that the UNESCO mention is generally present on the websites dealing with Sassi of Matera as a whole. Indeed, the reference to the fact that Matera has been declared World Heritage Site by UNESCO is widely communicated in general destination's websites. Regarding the main typologies of websites appearing in the first results of a web search about Sassi of Matera, it emerges that most of websites dealing mainly with Sassi of Matera are websites with a rich presence of UGC, such as blogs, YouTube, Pinterest, and TripAdvisor. This result suggests how a prospective traveler looking for information on the web about Sassi of Matera is likely to find, among the first three pages of Google results, websites with contents generated by other users and/or travelers, instead of official sources.

Touristic portals, booking engines, together with travel agencies and tour operators websites, and websites managed by private businesses, such as tour guides, local associations and for profit companies, also represent a large share of websites appearing in the searches. Online newspapers and magazines are also among the most frequent results of Sassi of Matera's Google search. DMOs websites (both at national and regional level) and Wiki pages—such as Wikipedia and Wikitravel—appeared to be less presented. However, from the analysis it emerges an evident lack of institutional and administrative websites. Indeed, there was only one official website managed by the UNESCO organization, and another one managed by Matera municipality. This result suggests a scarce online communication presence by official WHSs institutions, leaving the narratives about the WHS to contents produced by users, private companies and passionate travelers.

### 4.2 *Results of Phase B: Online Representation of the WHS from the HOSPITALITY Perspective*

Among the UNESCO WHS analyzed, 54 % of the Matera accommodation's websites makes specific reference that the Sassi of Matera is a UNESCO WHS (n° of websites: 64), whereas the 46 % does not mention the UNESCO label at all. Among the Matera accommodation's websites which make specific reference to the UNESCO label, only 26 of them mention UNESCO in the landing page provided by the search engine, whereas the remaining 38 give the UNESCO information within the website in different and various parts of the site, for example: in sections entitled "About Matera", "Territory", "Around Matera", or "Matera and its surroundings". However, only 13 websites go beyond the simple mention of the UNESCO label, by offering a more detailed explanation about the UNESCO

heritage, and only 7 add also reference about close WHSs such as Trulli of Alberobello, and Castel del Monte. Lack of attention of the local hospitality sector on mentioning the UNESCO label/information in their websites suggests room for improvement.

### 4.3 Results of Phase C: Online Representation of the WHS from the UGC Perspective

As in Table 1, the sample of online reviews gathered from TripAdvisor.com about Sassi di Matera consisted of comments of domestic visitors (n° of reviews: 310), while the outbound tourists' comments were 110. As regards the rating of each review, the vast majority of comments (372) have 5/5 which is the maximum possible evaluation on TripAdvisor, indicating an overall positive recognition of the attractiveness of the destination. The comments were content analyzed both in English and Italian, all the other languages were translated into English.

Regarding the main topics expressed in the comments, it was possible to identify two main categories that were almost presented in every review: "History" and "Atmosphere" topics. Because of their huge presence in almost the totality of the reviews, it has been preferred to not insert them in the counting of the topics. Indeed, almost all the reviews contain reference to the historical aspect of the Sassi di Matera, as well as to its atmosphere, which is considered—according to some adjectives used by reviewers—mystical, surreal, magic, relaxing, unique, fascinating, warm, fairy-tale and unforgettable.

Thus, the *panorama* of Sassi di Matera is the most frequent argument travelers indicate in their comment: a "breathtaking view", the "spectacular glimpses of the canyon" and the "overall panorama of the cave dwellings" attract the majority of travelers. The second most mentioned topic is the *night* element: "A pleasant walk through the Sassi at the sunshine" and the "view of the area with the warm night lighting" are considered something stunning. The comparison with the *Nativity scene* is another element recurrent in the reviews. Matera is compared to a natural open-air Nativity scene, especially at night, revealing a spiritual/religion attraction of the place. The spiritual/religion element is indeed frequently mentioned: it should not be forgotten that Matera is an important place of sacredness and worship,

**Table 1** Reviewer's rating and origin

Review rating		Reviewer's origin	
5/5	372	Italy	310
4/5	42	Rest of Europe + Russia	59
3/5	5	USA + Canada	21
1/5	1	Unknown	15
Tot.	420	Latin America	7
		Asia	6
		Australia	2

and that the several rock rupestrian churches with religious frescoes on the walls have been today recognized and added to the UNESCO designation. Another important point is due to the fact the Sassi of Matera has been used as filming location of the movie “*The Passion of Christ*” directed by Mel Gibson, and this also might enrich the perception of the place as sacred-religious.

Besides the panorama—especially enjoyed at the night—and the spiritual element, the third most discussed category is the *local cuisine*. Indeed, food and wine attract many reviewers’ comments. Regarding a clear *mention of UNESCO heritage*, it appears only 36 times. 32 comments also specifically mentioned that Matera have been selected as the European Capital of Culture for 2019, given also its recent award, suggesting a slight awareness about these institutional titles. Interestingly, Matera and its Sassi in the reviews are often *compared to other famous destinations* like the old Jerusalem, Cappadocia cave dwellings of Turkey, Bethlehem, caves of Indians in Western United States, Matmata in Tunisia, and Guadix in Andalusia. At the same time several mentions underline that no other places can be really similar to Matera, given its singular uniqueness and history. Nevertheless, these connections can be useful because they highlight the kind of destination for potential future visitors. Another interesting topic is the *cinetourism* effect. Many reviewers are aware of the potentialities Sassi have as ideal locations to film biblical TV and film scenes. Also in the reviews, they highlight that the Sassi of Matera have always been the set for several movies, such as the famous “*The Passion of Christ*” directed by Mel Gibson.

An in-depth analysis of the online reviews revealed the most recurrent positive and negative arguments about the destination Sassi of Matera (see Table 2).

Upon the whole corpus of 420 reviews, it appears a stronger presence of positive arguments rather than negative ones. While the positive arguments emerging from the analysis are contained in about the 81 % of the totality of comments, the negative ones cover approximately the 19 %.

Regarding the positive arguments mentioned in the comments, it emerges an overall declaration of the uniqueness of the place, the desire to repeat the visit, the escaping feeling or to live in a fairy tale, such as. “*must see; speechless; it should be*

**Table 2** Positive and negative arguments

Positive arguments (81 %)	Negative arguments (19 %)
<ul style="list-style-type: none"> <li>• Favorite destination</li> <li>• Like no other place seen before</li> <li>• Desire of coming back</li> <li>• Reality beyond imagination</li> <li>• To feel in another dimension</li> <li>• Pride</li> <li>• Cleanliness</li> <li>• Welcoming attitude</li> <li>• Peaceful and relaxing atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>• Difficulty and fatigue to move around</li> <li>• Perception problems</li> <li>• State of neglect and abandon</li> <li>• Tourist exploitation</li> <li>• Summer heat</li> <li>• Traffic and pollution</li> <li>• Not suitable for disabled</li> <li>• Tourist guides intrusion</li> <li>• Too expensive services</li> <li>• Elements ruining the landscape</li> <li>• Accessibility</li> </ul>

Source: Authors’ processing



*on everyone's bucket list; an experience not to be missed; I would live there (if only there was the sea, too); it has to be seen to be believed; any description could not ever do it justice outside of witnessing the beauty of it all in person".*

An interesting characteristic is the "surprise effect": several reviews indicate how their experience at the destination exceeded their expectations, and that they would never have imagined such a place. Another positive aspect emerged was related to the local population, described as welcoming and warm. Other reviews underline that Matera has changed positively over time, becoming now a more open and modern city, with a cleaner and safer environment. In fact, everybody agrees on the relax and the peaceful atmosphere of the destination.

Regarding the negative arguments mentioned in the reviews were mainly related to the mobility issue at the destination. Indeed, the difficulty to move and get around seems to be the most issue visitors face when visiting the Sassi of Matera "*presence of many stairs, slopes, the marble cobbles can be slick, some paths are very steep, the up-down is intense and the walk can be tiring and hard*". This mobility issue depicts the destination as not completely disability friendly, and describe the place as very hard to walk even with strollers and wheelchairs. Another negative issue emerged from travelers comments is related to the state of neglect and abandon of some areas of the destination: "*some portions of the site are abandoned and precarious, with shabby buildings, full of litter and a bit vandalized areas*". However, although this degradation, people say that the Sassi are still kept quite intact and that the municipality should deserve a greater care and maintenance. Furthermore, elements such as big satellite TV dishes and street protest banners are scattered around the site, ruining the landscape. Few people complained about traffic and pollution, saying that "*no vehicles which pollute should circulate in the main roads of the historical centre*". Negative attention is given also to the intrusive behavior of some tourist guides. In addition, some reviewers complain about the inflated price of some services, tour guides and souvenirs. Another drawback coming out from the analysis of the reviews is the mismatch from the tourists' prior belief about the destination, and their experience once in Matera. In particular, causing this perception gap is due to pictures presented online, and a lack of information regarding what to see/do at the destination. Lastly, accessibility problems sometimes give cause for complain: the fact that Matera is not connected to the national railway and it does not have an airport often discourages some tourists to visit it. Moreover, also visitors coming to destination by car resulted to have problem with the street conditions, scarcity or confusion of road signs, and difficulty in parking.

## 5 Conclusion

In the UNESCO World Heritage Sustainable Tourism Toolkit (<http://unescost.cc.demo.faelix.net>) it is stated that "every World Heritage site should have, at the very least, a basic website". The toolkit contains guidelines for a more sustainable planning and management of tourism in WHSs: having guidelines and an official

website for a WHS and a clear online strategy can help fostering the communication about the heritage and its Outstanding Universal Value.

In this context not only a website is needed in order to ensure an online presence for a tourism destination, but the involvement and active participation of online users in the online arena can represent an added value for the management of the sites, as they co-create narratives about the place, and in turn affect its overall online image and consequently its potential attractiveness for future visitors. Therefore, site managers should care not only to their official communication but also to the so-called user generated contents, which take place every time users freely comment on given destination elements (e.g. accommodations, attractions, etc.). This study highlights the increasing importance of Information and Communication Technologies (ICTs) in the online communication of a WHS. In particular, this study wants to contribute on how to investigate online contents from different online stakeholders in their communication of heritage values of the place, and tourism-related information to visitors.

More specifically, this study investigated the online presence and communication of the Italian WHS of Sassi of Matera, in order to understand how relevant can be online stakeholders' actions in the co-creation of the destination image. Results empirically supported the idea that nowadays destinations (and thus a WHS, intended here as a destination itself) are co-created by several players in the online domain. In particular, the destination perspective analysis revealed that the UNESCO mention is almost always displayed on the websites dealing with Sassi of Matera. From the analysis it emerges that most of those websites dealing with Sassi of Matera are mainly UGC platforms, such as YouTube, Pinterest, TripAdvisor, and blogs.

A limited presence of institutional websites indicate a scarce online communication managed by official WHSs institutions. Indeed, it appears that the online information about the Sassi of Matera are mostly co-created by users, private companies and passionate travelers. From the hospitality analysis emerged that 58 % of Matera accommodation mention in their websites the piece information regarding Sassi of Matera as UNESCO WHS, of which 24 % displayed this information in their homepage. The finding that the UNESCO recognition is cited in little more than half of the analyzed accommodation's websites means that there can be room for improvement for a consistent communication of the heritage values among the local hospitality sector, and at institutional level. The in-depth content analysis of TripAdvisor comments about Sassi of Matera, revealed the most frequent topics about the destination mentioned by tourists and which are the positive and negative aspects related to the site. Therefore site managers might find useful listen the online contents by all online stakeholders, in order to be aware on what it is said online about the destination and in turn start an effective online marketing strategy, enhance the management of the destination as a whole, and overall learn how to improve the experience of visitors at the destination.

There are some limitations associated with this study which are important to acknowledge. First the research design considered a single case study, thus, the content analysis and the related online representation of the destination studied is

limited to one specific domain and results cannot be generalized. Second, the content analysis was limited to a specific time frame, thus, topics which were not presented on the analysed contents can be portrayed in other ones not considered in this study.

Therefore, future research should consider to replicate the study with other WHSs, including both WHSs nationally and internationally in order to identify peculiarities of different WHSs. Future research are also suggested in order to extend the time frame analysed, with the aim to understand the evolution of topics expressed online regarding the destination under study. Finally, a triangulation of the data stemming from different online sources using a research tool, such as NVIVO10, is suggested in order to verify and compare results gathered from the data coding.

## References

- Ali, A., & Frew, A. J. (2013). *Information and communication technologies for sustainable tourism*. New York: Routledge.
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—the state of eTourism research. *Tourism Management*, 29(4), 609–623.
- Cantoni, L. (2013). Outline and “philosophy” of the UNESCO chair in ICT to develop and promote sustainable tourism in World Heritage Sites. Retrieved from: [www.unescochair.usi.ch/outline](http://www.unescochair.usi.ch/outline)
- Choi, S., Lehto, X. Y., & O’leary, J. T. (2007). What does a consumer want from a DMO Website?—A study of US and Canadian tourists’ perspectives. *International Journal of Tourism Research*, 9(2), 59–72.
- De Ascaniis, S., Gretzel, U., & Mistilis, N. (2012). What tourists want to know: An analysis of questions asked at visitor information centres. In *Proceedings of CAUTHE 2012, 22nd Conference of the Council for Australian University Tourism and Hospitality Education, Melbourne, Australia, 6–9 February 2012*.
- De Ascaniis, S., & Gretzel, U. (2013). Communicative functions of Online Travel Review titles. A pragmatic and linguistic investigation of destination and attraction OTR titles. *Studies in Communication Sciences*, 13(2), 156–165.
- De Ascaniis, S., Tritto, A., & Adukaite, A. (2014). Potential and implications for destination management of online travel reviews’ argumentative analysis: The case of domestic and international tourism market in Jiuzhaigou National Park China. Travel and Tourism research Association Asia Pacific (TTRA APac) Chapter 2014 Conference. Melbourne, Australia. December 4–5, 2014.
- De Capua, A., & Dunham, J. F. (1993). Strategies in the discourse of advice. *Journal of Pragmatics*, 20(6), 519–531.
- De Jager, K. (2009). Co-creation as a strategic element of tourism destination competitiveness. Breda University of Applied Sciences.
- Gretzel, U., Fesenmaier, D. R., Formica, S., & O’Leary, J. T. (2006). Searching for the future: Challenges faced by destination marketing organizations. *Journal of Travel Research*, 45, 116–126.
- Gross, M. J., & Brown, G. (2006). Tourism experiences in a lifestyle destination setting: The roles of involvement and place attachment. *Journal of Business Research*, 59(6), 696–700.

- Kim, W. G., Limb, H., & Brymer, R. A. (2015). The effectiveness of managing social media on hotel performance. *International Journal of Hospitality Management*, *44*, 165–171.
- Law, R., Leung, R., & Buhalis, D. (2008). Information technology applications in hospitality and tourism: a review of publications from 2005 to 2007. *Journal of Travel and Tourism Marketing*, *26*(5), 599–623.
- Marchiori, E., & Cantoni, L. (2012). The online reputation construct: Does it matter for the tourism domain? *Journal of Information Technology and Tourism*, *13*(3), 139–159.
- Mariani, M. M., Baggio, R., Buhalis, D., & Longhi, C. (2014). *Tourism management, marketing and development: The importance of networks and ICTs*. New York: Palgrave.
- Neuhofner, B., Buhalis, D., & Ladkin, A. (2013). Experiences, Co-creation and technology: A conceptual approach to enhance tourism experiences. *Proceedings of Cauthe 2013*: 546–555.
- Pine, J. B., & Gilmore, J. H. (1999). *The experience economy: Work is theater and every business a stage*. Cambridge: Harvard Business School.
- Schieder, T., Adukaite, A., & Cantoni, L. (2014). mobile apps devoted to UNESCO world heritage sites: A map. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 17–31). Berlin: Springer.
- Tussyadiah, I. P., & Fesenmaier, D. R. (2007). Interpreting tourist experiences from first-person stories: A foundation for mobile guides, ECIS 2007 Proceedings. Retrieved May 3, 2013 from <http://aisel.aisnet.org/ecis2007/104/>
- Tussyadiah, I. P., & Fesenmaier, D. R. (2009). Mediating the tourist experiences access to places via shared videos. *Annals of Tourism Research*, *36*(1), 24–40.
- Tussyadiah, I. P., & Zach, F. J. (2012). The role of geo-based technology in place experiences. *Annals of Tourism Research*, *39*(2), 780–800.
- UNESCO. (1972). Convention concerning the protection of the world cultural and natural heritage, adopted by the general conference at its seventeenth session in Paris, November 16, 1972. Retrieved May 20, 2013 from <http://whc.unesco.org/archive/convention-en.pdf>
- UNESCO World Heritage Centre. (2013). Operational guidelines for the implementation ii of the world heritage convention. Paris, pp. 20–24.
- Vargo, S. L., & Lusch, R. F. (2008). From goods to service(s): Divergences and convergences of logics. *Industrial Marketing Management*, *37*, 254–259.
- Yoo, K. H., & Gretzel, U. (2008). What motivates consumers to write online travel reviews? *Information Technology and Tourism*, *10*(4), 283–295.

**Part II**  
**Social Media and User Generated Contents**

# Factors Affecting the Performance of Tourism Crowdfunding Projects: An Empirical Study

Huiying Li, Zhisheng Wang, Bin Fang, and Yu-Shan Liu

**Abstract** This study illustrates those determinants affecting the performance of crowdfunding in the tourism field through an empirical study. Drawing on a dataset of 1701 projects from an online global tourism crowdfunding website, this study identifies a series of factors that influence fundraising performance. This study indicates that the information quality and charity orientation of the projects are associated with the performance of tourism crowdfunding, and that social networks established by backers or pledgers are related to the success of tourism crowdfunding projects. In addition, we find that all-or-nothing projects with a smaller goal, a greater trip rating, and more backers will have a better fundraising performance. These results offer insights into the frontiers of tourism crowdfunding and shed light on the general ways for project creators to obtain more funds in their crowdfunding projects for travel.

**Keywords** Tourism crowdfunding • Social network • Quality of information • Charitable funding

## 1 Introduction

With the rapid development of IT, companies could outsource their internal business tasks to other firms, groups, and even individuals. Crowdfunding emerges when the required resources fall into the capital and are raised from a distributed network of individuals in terms of an open call (Belleflamme, Lambert, & Schwienbacher, 2014). Crowdfunding has been booming in recent years after some doubts and criticism. Crowdfunding had grown to 46 % compounded annual

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growth rate in 2012 (Burns, 2013). In March 2014, Kickstarter surpassed \$1 billion in pledges made. By 2025, the global crowdfunding market is expected to reach between \$90 billion and \$96 billion, which is roughly 1.8 times of that in 2013 (Noyes, 2014).

The fast development of the international crowdfunding market has drawn attention from scholars. To date, the findings that shed light on the matter could be demonstrated in the following preliminary points. First, the dynamics of crowdfunding was analyzed for project creators to achieve fundraising success (Balboni, Kocollari, & Pais, 2014; Joenssen, Michaelis, & Müllerleile, 2014; Mollick, 2014). Second, the influence of specific factors, such as social capital (Koning & Model, 2013; Zheng, Li, Wu, & Xu, 2014), community influence (Inbar & Barzilay, 2014), network externality (Parker, 2014), and funding types (Cumming, Leboeuf, & Schwiendbacher, 2014), on fundraising performance was explored. Third, in addition to empirical studies, mathematical models were also applied to the field of crowdfunding to identify some investment rules for investors (Belleflamme et al., 2014; Li & Duan, 2014). Prior studies only covered the dynamics of crowdfunding in general but did not distinguish them among industries. As a service representation, the tourism industry has some special characteristics that products do not emphasize. Concerning this point, a better understanding of the dynamics of crowdfunding in a specific industry will offer supplements to the current research. This study addresses the knowledge gap in the context of tourism and demonstrates our understanding of the factors that affect the performance of tourism crowdfunding projects in particular. We conducted an empirical study using a dataset comprising 1701 tourism campaigns released by a global tourism crowdfunding platform. We estimated the extent, if any, to which the factors affect tourism fundraising performance.

## 2 Literature Review and Hypotheses

### 2.1 Crowdfunding

The concept of crowdfunding originates from crowdsourcing, which was conceived by Howe (2008) and described as the act of a company obtaining creative solutions from a distributed network of individuals in terms of an open call. In this way, companies could obtain solutions to difficult issues from customers, partners, and even strangers. When the solutions are replaced by financial resources, crowdfunding appears. A broad definition of crowdfunding involves donations-based, reward-based, lending-based, and equity crowdfunding, wherein the actual goals of its backers are not homogeneous. In donations-based crowdfunding, such as initiating theater projects for the favorite actors of the backers, backers contribute to projects without expecting anything in return (Boeuf, Darveau, & Legoux, 2014). In reward-based crowdfunding, which is the most common form of crowdfunding,

backers could receive a reward for supporting the project. In lending-based crowdfunding, which is also labeled as P2P lending, backers act as lenders and receive principal and interest (Yum, Lee, & Chae, 2012). In equity crowdfunding, which should be subject to rigorous regulations, backers are treated as shareholders.

Inherited from the spirit of crowdsourcing introduced by Kleemann, Voß, and Rieder (2008), the definition of crowdfunding by Belleflamme et al. (2014: 588) is “involving an open call, mostly through the Internet, for the provision of financial resources either in the form of donation or in exchange for the future product or some form of reward to support initiatives for specific purposes.” In this paper, we would follow the definition mentioned above and focus on tourism projects that fit in either donations-based crowdfunding or reward-based crowdfunding.

Prior studies concentrated on identifying the factors that affect the success of crowdfunding, exploring herding behaviors of backers, finding the effect of the community or social influence, and discussing the delivery of rewards. In the studies of Ibrahim and Verliyantina (2012), Joenssen et al. (2014), and Mollick (2014), several determinants, such as project quality, geography, social ties, and number of backers, were identified to have significant effects on the success of crowdfunding. The positive effect of social capital on crowdfunding was studied by Koning and Model (2013), Lehner (2014) and Zheng et al. (2014). Agrawal, Catalini, and Goldfarb (2010) and Kuppuswamy and Bayus (2014) helped backers find the best investment opportunity in the perspective of herding effects.

Scholars have developed several directions to explore the dynamics of crowdfunding because it is novel and transformational to traditional fundraising approaches. However, crowdfunding applied to other fields, such as the tourism industry, has not received attention. It is important to understand how crowdfunding works in the tourism industry, and the roles, if any, that factors play in tourism crowdfunding.

## ***2.2 Charitable Cues in Project Descriptions***

The factors that motivate individuals to participate in crowdfunding projects are not only the monetary compensation or rewards, but also the non-monetary benefits that they value. In the crowdfunding of most fields (e.g., technology, design, and other fields), backers would receive a reward for supporting a project in a limited time, whereas in other fields such as music, education, and tourism, most contributors taking part in crowdfunding are driven by non-financial motivations and are only involved as patrons who support their favorite artists or campaigns. Galuszka and Bystrov (2014) found that the non-financial motivations of contributors were a significant factor that helped a project to succeed. Tourism crowdfunding has something in common with art crowdfunding, which combines fundraising with donations. Backers experience the feelings of creators only through postcards, mails, blogs, pictures, or videos, and they rarely receive rewards equivalent to their pledge. Thus, it is important for project creators to create a campaign with a



stronger public-spirited motivation. The project creators consider the public more, and they would raise more funds. Therefore, the following is hypothesized:

*H1: Charity-orientation expressed in projects is positively related to the performance of tourism crowdfunding.*

### **2.3 Signals of Project Quality**

In an online crowdfunding environment, it is less clear for individuals to distinguish the extraordinary projects from the ordinary ones. Indeed, the traditional face-to-face interviews and the presentations of preparedness demonstrated to potential investors, which were considered as effective signals of project quality for aspiring investors in the past, are replaced by the development of Internet (Cardon, Sudek, & Mitteness, 2009). If no salient signals of project quality exist in crowdfunding for travels, the projects will not be backed adequately; thus, they may be aborted. In online crowdfunding platforms, Mollick (2014), Balboni et al. (2014) as well as Inbar and Barzilay (2014) found that a video in a campaign description could be considered as a signal of higher quality. Compared with text, images could be another way of conveying a more adequate preparedness to project backers. Joenssen et al. (2014) and Li and Duan (2014) demonstrated that the provision of more images influences the project success positively. Thus, considering this rationale, we posit the following:

*H2a: Tourism crowdfunding projects prepared with a video in the description will have a higher percentage of reaching the funding goal.*

*H2b: Tourism crowdfunding projects prepared with images in the description will have a higher percentage of reaching the funding goal.*

Moreover, as Mollick (2014) indicated that projects preferred by the Kickstarter staff were likely to succeed, we also found that “sponsors” in tourism crowdfunding platforms could be considered as a feature that is not driven by coerciveness and obligation but instead by the support of independent companies. Thus, we propose the following:

*H2c: The number of sponsors that support a tourism crowdfunding project is positively related to the percentage of reaching the funding goal.*

### **2.4 Social Networks of Visitors**

In the field of crowdfunding, internal social network ties of project creators provide benefits of information sharing and supplementing other determining factors that motivate investors to pledge (Zheng et al., 2014). In general, project creators share the URL of their crowdfunding project in their SNS and call on their families and

friends to back them. Creators who have more contacts find it easier to reach their goal. Therefore, the internal social network ties of project creators are considered as a factor that demonstrates social influence theories in many studies (Inbar & Barzilay, 2014; Koning & Model, 2013; Mollick, 2014). However, crowdfunding platforms have provided another way to share project information, which is not considered in previous research. For external visitors browsing the webpage, they could share the URL in their SNS, and the pledge from their friends would help improve the probability of tourism crowdfunding success. Thus, we suppose the following:

*H3: Sharing among social networks by visitors is positively associated with the performance of tourism crowdfunding projects.*

## **2.5 Funding Types**

In most crowdfunding platforms, individuals pledge funds to support the projects they preferred, and project creators receive the funds for their goals. Generally, two types of funding methods are open to all individuals in crowdfunding platforms. One is the all-or-nothing funding model or the flexible model, where the project creator sets a fundraising goal and keeps nothing unless the goal is achieved. The other type is the keep-it-all funding model or the fixed model, where the project creator sets a fundraising goal and keeps the entire amount raised regardless of whether he meets his goal (Cumming et al., 2014). The platforms investigated by prior studies that focus on crowdfunding usually offer only one funding type, such as the Kickstarter offering fixed model; thus, the effect of funding type on the success of the projects is not emphasized (Belleflamme & Lambert, 2014; Qiu, 2013). In reward-based crowdfunding, a few studies attempted to explore the influence of funding type on project success and found that small scalable projects were more likely to be funded through the flexible model, whereas large non-scalable projects were more likely to be funded through the fixed model (Cumming et al., 2014). Considering the rationales above, we believe that the funding types in crowdfunding for travels would have an effect on the performance of projects, which fills a gap existing in the tourism literature. Given that the funding requirements of projects in crowdfunding for travel are usually small, we propose the following based on Cumming's findings (2014):

*H4: Flexible fundraising projects are likely to raise more funds than fixed fundraising projects in crowdfunding for travel.*

## 2.6 Characteristics of Projects

Reputation or ratings in e-commerce are proved to be effective tools to increase sales (Hu, Bose, Koh, & Liu, 2012; Hu, Koh, & Reddy, 2014; Riedl, Blohm, Leimeister, & Krcmar, 2013). Customers have the habit of turning to electronic word-of-mouth marketing (e-WOM) when they make online purchasing decisions. Prior studies have found that the valence of ratings had a positive effect on sales performance (Flanagin & Metzger, 2013; Lu, Xiao, & Ye, 2012). Similar to tourism crowdfunding, the ratings of a specific project are shown in term of stars: five stars represent a high rating, whereas one star indicates a non-popular campaign. Drawing from the scholars on the e-commerce context, we suggest the following:

*H5a: Trip ratings of the projects have a positive effect on the performance of tourism crowdfunding.*

In addition to the effects of e-WOM, herding effects are also confirmed in an online environment. Customers are more willing to believe in the choices of others in the stock market (Kremer & Nautz, 2013; Pierdzioch & Rulke, 2012) or in online purchasing (Duan, Gu, & Whinston, 2009; Ye, Cheng, & Fang, 2013). The increasing number of individuals backing projects indicate the credibility and feasibility of the projects. Parker (2014) found that information cascades occurring in crowdfunding projects could mitigate the issue of good projects without enough backers. Koning and Model (2013) indicated that larger numbers of contributors represented a stronger signal of project quality and success probability. Therefore, we suppose the following:

*H5b: The number of backers is positively associated with the performance of tourism crowdfunding projects.*

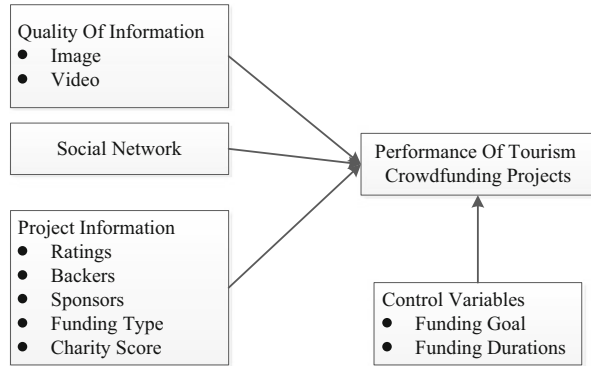
We also collected data for two control variables. One is crowdfunding goal, which represents the total amount of funds that project creators aim to raise for a particular campaign. We use this variable to compensate for the information loss caused by fundraising ratios. According to the findings of prior studies (Cumming et al., 2014; Zheng et al., 2014), we suppose that projects with a small goal will achieve a better fundraising performance. The other variable is crowdfunding duration, which represents the length of days from the start to the end of the fundraising process. As time goes by, the projects would be seen by more individuals, and more funds would be raised. Therefore, we posit the following:

*H5c: Funding durations have a positive effect on the performance of tourism crowdfunding projects.*

*H5d: Funding goal has a negative effect on the performance of tourism crowdfunding projects.*

To summarize our arguments, if the projects in crowdfunding for travel could provide more videos and images, own more links shared in social networks, and aim

**Fig. 1** Theoretical framework



at charity orientation, then their fundraising percentage will be higher. Our theoretical framework is illustrated in Fig. 1.

### 3 Research Methodology

#### 3.1 Data Collection

As the goal of this study is to provide a wide perspective on tourism crowdfunding, we collected data from Trevolta (URL: <http://www.trevolta.com/>), which is a globally crowd-funded travel website. This website enables travelers to submit their extraordinary ideas for expeditions to raise funds for them. Projects can be backed by inspired people or sponsors looking for marketing opportunities and brand awareness (Trevolta, 2014).

We used the universe of projects on Trevolta from its inception in 2013 to October 2014, which created an initial sample of 1706 projects. However, five projects were different from others such that were launched for a special goal of rhino rescue with a different funding data structure. After removing these projects, 1701 projects remained in our sample. For each project, we collected the following information: the project name, duration, funding percent, project goal, funding raised, trip rating, backers, sponsors, and project descriptions. These important contents of interest include a variety of key variables in this study, which are summarized in Table 1.

#### 3.2 Empirical Model

To identify the factors that affect the performance of tourism crowdfunding projects, we developed the following regression model to test our proposed hypotheses.

**Table 1** Descriptions of key variables

Key variables	Descriptions
<i>Funding_Raised</i>	The amount founders had collected using tourism crowdfunding
<i>Funding_Goal</i>	The amount founders seek to raise using tourism crowdfunding
<i>Trip_Rating</i>	The ratings of a project given by individual visitors and funders; a project with more stars has higher appraisals.
<i>Sponsors</i>	The number of companies or organizations that are interested in backing the project
<i>Backers</i>	The number of individual funders supporting the project
<i>Durations</i>	The number of days from the start to the end of a certain project
<i>Video</i>	A dummy variable to record the existence of videos in the project description
<i>Image</i>	A dummy variable to record the existence of images in the project description
<i>Funding_Type</i>	The travel creators create a campaign by using the all-or-nothing model [fixed funding, recorded as 1 in Eq. (2)] or the keep-it-all model [flexible funding, recorded as 2 in Eq. (2)].
<i>Social_Network</i>	The volume of reposts about the project in Facebook and Twitter
<i>Charity_Score</i>	The charitable effort embodied in the project
<i>Funding_Percent</i>	The percentage of a project's goal that is actually raised by creators

Unlike in prior studies where the performance is measured using a binary indicator (Beier & Wagner, 2014; Inbar & Barzilay, 2014; Joenssen et al., 2014; Mollick, 2014), the present study adopted a continuous indicator to measure performance because of the large proportion of patronage-based projects and flexible projects in the crowdfunding projects, wherein a high funding percentage could be regarded as successful. Therefore, the dependent variable *Funding\_Percent* was measured as the proportion of raised funds to the funding goal, the value of which ranged from 0 and a above, with a higher percentage indicating more funds raised. Accordingly, we proposed the following model in Eq. (1):

$$\begin{aligned}
 \text{Funding\_Percent} = & \alpha_0 + \sum_{i=1}^m \beta_i \text{Project\_Characteristics} \\
 & + \sum_{i=1}^n r_i \text{Information\_Quality} + \sum_{i=1}^p \hat{\delta}_i \text{Social\_Networks} \\
 & + \sum_{i=1}^q \delta_i \text{Control\_Variables}
 \end{aligned} \tag{1}$$

where the main variables are demonstrated in our theoretical framework.

*Project\_Characteristics* represents t basic attributes of a project in tourism crowdfunding, including the ratings of trip projects, number of backers for each project, funding model that they adopt, and scores for the charity orientation of each project. Specifically, the measurement of charitable effort in the project contents

was conducted using Likert scales. We invited five experts in sociology who scored each project according to charity orientation. For instance, if the creators initiate projects for themselves, such as helping me go to Paris for a holiday, then the score of charity orientation is recorded as 1, whereas if the creators initiate projects for their parents or friends to celebrate ceremonies, such as helping my friends celebrate their first anniversary, then the score is marked with 2. In addition, if the creators initiate projects for the prevention and treatment of diseases as volunteers, the score can be as high as 7. After the experts gave the scores, we averaged them and obtained the values of *Charity\_Score* for each project.

*Information\_Quality* includes the signals that represent the quality of tourism crowdfunding projects. In this study, the number of sponsors backing the project and whether images or a video is demonstrated in the project descriptions are regarded as indicators that improve the quality of projects for tourism crowdfunding.

*Social\_networks* aims to explore the effect of project link sharing in SNS or the focus on the increasing number of friends and followers in SNS. In this study, it represents the volume of reposts about the project in Facebook and Twitter.

*Control\_Variables* includes all other factors that may influence the performance of the projects in tourism crowdfunding. Consistent with other studies (Mollick, 2014; Zheng et al., 2014; Zvilichovsky, Inbar, & Barzilay 2014), this study considers the project goal and the funding durations as control variables.

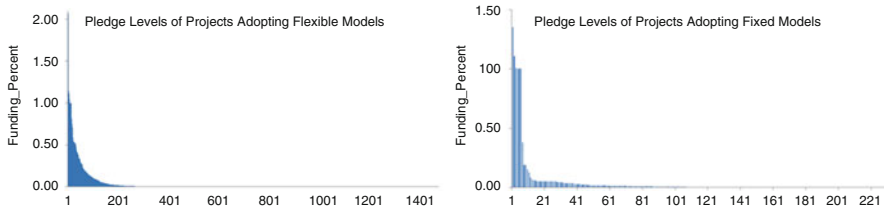
We used Eq. (2) to predict the effects of all factors on the performance of projects in tourism crowdfunding in this study.

$$\begin{aligned}
 \text{Funding\_Percent} = & \alpha_0 + \beta_1 \text{Trip\_Rating} + \beta_2 \text{Backers} + \beta_3 \text{Funding\_Type} \\
 & + \beta_4 \text{Charity\_Score} + \beta_5 \text{Video} + \beta_6 \text{Image} + \beta_7 \text{Sponsors} \\
 & + \beta_8 \text{Social\_Network} + \beta_9 \text{Durations} + \beta_{10} \text{Funding\_Goal} \\
 & + \varepsilon
 \end{aligned} \tag{2}$$

## 4 Data Analysis and Results

### 4.1 Descriptive Statistics

Of all the projects, 86.60 % adopted the flexible model, and only 13.40 % of the projects adopted the fixed model, which indicated that the creators of most tourism crowdfunding projects kept all the funds pledged by backers even if their goals were not reached. Among all tourism crowdfunding projects, many failed to reach the goal, and only a few were successful, which is consistent with previous studies (Agrawal et al., 2010; Belleflamme et al., 2014; Mollick, 2014). Projects that adopted the fixed model tended to fail by large margins, with only 2.6 % of the projects reaching their goals. About 25.80 % of the projects that adopted the flexible model managed to be funded. However, only 1 % of them were funded over their goals. Figure 2 shows the histograms of pledge levels for each group.



**Fig. 2** Histograms of pledge levels for two groups

Table 2 contains the descriptive statistics of the projects and key variables. We provide the number of observations, means, standard deviations, and minimum and maximum for the final sample based on the model provided [see Eq. (2)]. In all the projects, the mean of funding goals is approximately \$4852.30, which indicates relatively less targets compared with other categories of crowdfunding projects, such as projects in design and technology (Mollick, 2014). However, the pledges of backers only reach \$116.79 on average. The maximum number of reposts about the projects in Facebook and Twitter is about 703.

## 4.2 Regression Results

Analysis was performed by using Tobit regression to analyze all records that meet the criteria described above ( $N = 1701$ ). This approach is appropriate because the dependent variable was censored in nature: it was constructed as a ratio, and its value was bounded in range (Greene & Zhang, 2003). Table 3 provides the results. The analysis indicates a good fit, with a highly significant likelihood ratio ( $p < 0.001$ ) and a pseudo  $R^2$  value of 0.6821 (Veall & Zimmermann, 1996).

Table 3 shows that charitable effort in the project contents is strongly associated with the performance of tourism crowdfunding ( $\beta_4 = 0.0469$ ,  $t$  value = 7.94), which supports H1.

The projects with videos or images in their descriptions showed a better funding performance ( $\beta_5 = 0.0454$ ,  $t$  value = 2.90;  $\beta_6 = 0.0286$ ,  $t$  value = 2.12). Therefore, H2a and H2b were supported. The results also confirmed that the number of sponsors backing the projects could influence the performance of tourism crowdfunding positively, which indicated that companies or organizations that are interested in backing the projects would enhance the success rate ( $\beta_7 = 0.0446$ ,  $t$  value = 3.86). Thus, H2c was supported.

The effect of social network on the performance of tourism crowdfunding projects could be perceived through the reposts about the project in Facebook and Twitter, which has a positive effect on the performance ( $\beta_8 = 0.0388$ ,  $t$  value = 7.13). Thus, H3 was supported.

The results showed that funding type had a negative effect on the performance ( $\beta_3 = -0.1263$ ,  $t$  value = -7.38), which indicated that fixed fundraising projects

**Table 2** Descriptive statistics of projects and key variables

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Funding_Percent</i>	1701	0.0337	0.1441	0	2.07
<i>Funding_Raised</i>	1701	116.7901	697.361	0	19,876
<i>Funding_Goal</i>	1701	4852.297	5129.416	1000	57,900
<i>Trip_Rating</i>	1701	1.6106	2.0480	0	5
<i>Sponsors</i>	1701	0.0282	0.414903	0	10
<i>Backers</i>	1701	1.9864	8.5132	0	157
<i>Durations</i>	1701	86.4227	207.4213	0	4680
<i>Video</i>	1701	0.1952	0.3965	0	1
<i>Image</i>	1701	0.4315	0.4954	0	1
<i>Funding_Type</i>	1701	1.8654	0.3414	1	2
<i>Charity_Score</i>	1701	1.4444	1.0278	1.0000	6.7429
<i>Social_Network</i>	1701	5.1987	25.0846	0	703

**Table 3** Tobit analysis results

Dependent variable: <i>Funding_Percent</i>	Coefficient	Standard error	T-value	Sig.
<i>Constant</i>	0.4290	0.0734	5.84	0.000
<i>log (Funding_Goal)</i>	-0.0669	0.0082	-8.12	0.000
<i>Trip_Rating</i>	0.0303	0.0034	8.92	0.000
<i>Sponsors</i>	0.0446	0.0115	3.86	0.000
<i>Backers</i>	0.0099	0.0007	15.17	0.000
<i>Durations</i>	0.0000	0.0000	0.34	0.737
<i>Video</i>	0.0454	0.0156	2.90	0.000
<i>Image</i>	0.0286	0.0135	2.12	0.034
<i>Funding_Type</i>	-0.1263	0.0171	-7.38	0.000
<i>Charity_Score</i>	0.0469	0.0059	7.94	0.000
<i>Social_Network</i>	0.0388	0.0054	7.13	0.000

Number of obs = 1701 LR chi2(10) = 894.35  
 Log likelihood = -208.43879 Pseudo R<sup>2</sup> = 0.6821

were more likely to succeed than flexible ones in tourism crowdfunding. Contrary to the null hypothesis, H4 was rejected.

Moreover, taking from the e-WOM effects and herding effects, we found that the trip ratings had a significantly positive effect on the performance of tourism crowdfunding projects ( $\beta_1 = 0.0303$ , t value = 8.92), and a higher number of backers predicted a higher rate of success ( $\beta_2 = 0.0099$ , t value = 15.17). Therefore, H5a and H5b were both supported.

In addition, for the controllable variables, we found that increasing funding goals were negatively associated with the performance of tourism crowdfunding projects ( $\beta_{10} = -0.0669$ , t value = -8.12). Thus, H5d was supported. Surprisingly, the effect of durations was not significant ( $\beta_9 = 0.0000$ , t value = 0.34), which is inconsistent with the studies by Mollick (2014) and Cumming et al. (2014). Thus, H5c was rejected by the evidence in our study.



## 5 Conclusions

This study sheds light on identifying the factors that affect the performance of tourism crowdfunding projects. To do this, we empirically analyzed 1701 projects in an online global tourism crowdfunding website. The empirical results reported that the information quality of projects, such as images, videos, and sponsors would positively affect the performance of tourism crowdfunding projects. The charity orientation implied in the project would help creators achieve higher pledge levels. We also found that projects with a smaller goal, a greater trip rating, and more backers would have a better fundraising performance. In terms of the volume of reposts about the project in Facebook and Twitter, social networks turn out to be an important factor that affects the performance of tourism crowdfunding. In addition, according to our results, projects adopting the fixed model would attract more backers to pledge than projects adopting the flexible model. To our knowledge, this research is one of the first studies to explore the determinants of the success of tourism crowdfunding projects by using global data. This study supplements the findings of prior research and provides a better view of the factors that influence the performance of crowdfunding across barriers in different fields. The results also provide project creators with some hints on raising more funds in a limited time.

In addition, several limitations are found in this study. First, we did not consider other variables that might affect the performance of crowdfunding, such as the number of rewards, the number of creators in a team, and the number of friends or followers that the project creators have. Second, this study did not consider the delivery of project rewards, which is important for creators to initiate other projects and for their credibility. Future research could record the contents of topics in the projects to monitor the progress and could explore the effect of project progress on the performance of tourism crowdfunding. Third, although backers have been explored to be a factor affecting project performance, we did not find the way they influence the behavior of following backers. Future studies should examine the role of backers by using panel data from the perspective of the herding effect. Overall, this study takes an initial attempt to explore a broader range of research questions in the field of crowdfunding from the perspective of tourism and sociology.

## References

- Agrawal, A., Catalini, C., & Goldfarb, A. (2010). The geography of crowdfunding. NET Institute Working Paper No. 10-08. Available at SSRN: <http://ssrn.com/abstract=1692661>
- Balboni, B., Kocollari, U., & Pais, I. (2014). How can social enterprises develop successful crowdfunding campaigns? An empirical analysis on Italian context. Available at SSRN: <http://ssrn.com/abstract=2430463>

- Beier, M., & Wagner, K. (2014). Crowdfunding success of tourism projects – evidence from Switzerland. e-Review of tourism research (eRTR), Forthcoming. Available at SSRN: <http://ssrn.com/abstract=2520925>
- Belleflamme, P., & Lambert, T. (2014). Crowdfunding: Some empirical findings and microeconomic underpinnings. Available at SSRN: <http://ssrn.com/abstract=2437786>
- Belleflamme, P., Lambert, T., & Schwienbacher, A. (2014). Crowdfunding: Tapping the right crowd. [Article]. *Journal of Business Venturing*, 29(5), 585–609.
- Boeuf, B., Darveau, J., & Legoux, R. (2014). Financing creativity: Crowdfunding as a new approach for theatre projects [Article]. *International Journal of Arts Management*, 16(3), 33–48.
- Burns, C. (2013). Crowdfunding far from niche in 2015. Retrieved Jan. 16, 2015, from <http://kae.com/ideabank/crowdfunding-far-from-niche-in-2015-2/>
- Cardon, M., Sudek, R., & Mitteness, C. (2009). The impact of perceived entrepreneurial passion on angel investing. *Frontiers of Entrepreneurship Research*, 29(2), 1–15.
- Cumming, D. J., Leboeuf, G., & Schwienbacher, A. (2014). Crowdfunding models: Keep-it-all vs. all-or-nothing. Paris December 2014 Finance meeting EUROFIDAI – AFFI Paper. Available at SSRN: <http://ssrn.com/abstract=2447567>
- Duan, W., Gu, B., & Whinston, A. B. (2009). Informational cascades and software adoption on the internet: An empirical investigation. *Mis Quarterly*, 33(1), 23–48.
- Flanagin, A. J., & Metzger, M. J. (2013). Trusting expert- versus user-generated ratings online: The role of information volume, valence, and consumer characteristics. *Computers in Human Behavior*, 29(4), 1626–1634.
- Galuszka, P., & Bystrov, V. (2014). Crowdfunding: A case study of a new model of financing music production. *Journal of Internet Commerce*, 13(3-4), 233–252.
- Greene, W. H., & Zhang, C. (2003). *Econometric analysis*. Upper Saddle River, NJ: Prentice Hall.
- Howe, J. (2008). *Crowdsourcing. Why the power of the crowd is driving future of business*. New York: Three Rivers Press.
- Hu, N., Bose, I., Koh, N. S., & Liu, L. (2012). Manipulation of online reviews: An analysis of ratings, readability, and sentiments. *Decision Support Systems*, 52(3), 674–684.
- Hu, N., Koh, N. S., & Reddy, S. K. (2014). Ratings lead you to the product, reviews help you clinch it? The mediating role of online review sentiments on product sales. *Decision Support Systems*, 57, 42–53.
- Ibrahim, N., & Verliyantina. (2012). The model of crowdfunding to support small and micro businesses in Indonesia through a web-based platform. [Proceedings Paper]. *International conference on small and medium enterprises development with a theme 'innovation and sustainability in SME development' (Icsmad 2012)*, 4, 390–397.
- Inbar, Y., & Barzilay, O. (2014). Community impact on crowdfunding performance. Available at SSRN: <http://ssrn.com/abstract=2524910>
- Joenssen, D. W., Michaelis, A., & Müllerleile, T. (2014). A link to new product preannouncement: Success factors in crowdfunding. Available at SSRN: <http://ssrn.com/abstract=2476841>
- Kleemann, F., Voß, G. G., & Rieder, K. (2008). Under paid innovators: The commercial utilization of consumer work through crowdsourcing. *Science, Technology and Innovation Studies*, 4(1), 5–26.
- Koning, R., & Model, J. (2013). Social influence mechanisms in crowdfunding cascades: When nothing is better than something. Available at SSRN: <http://ssrn.com/abstract=2308161>
- Kremer, S., & Nautz, D. (2013). Short-term herding of institutional traders: New evidence from the German stock market. *European Financial Management*, 19(4), 730–746.
- Kuppaswamy, V., & Bayus, B. L. (2014). Crowdfunding creative ideas: The dynamics of project backers in Kickstarter. UNC Kenan-Flagler Research Paper No. 2013-15. Available at SSRN: <http://ssrn.com/abstract=2234765>
- Lehner, O. M. (2014). The formation and interplay of social capital in crowdfunded social ventures [Article]. *Entrepreneurship and Regional Development*, 26(5–6), 478–499.

- Li, Z., & Duan, J. A. (2014). Dynamic strategies for successful online crowdfunding. NET Institute Working Paper No. 14-09. Available at SSRN: <http://ssrn.com/abstract=2506352>
- Lu, Q., Xiao, L., & Ye, Q. (2012). Investigating the impact of online word-of-mouth on hotel sales with panel data. In L. Hua (Ed.), *2012 International conference on management science and engineering* (pp. 3–9).
- Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study [Article]. *Journal of Business Venturing*, 29(1), 1–16.
- Noyes, K. (2014). Why investors are pouring millions into crowdfunding. Retrieved Jan. 16, 2015, from <http://fortune.com/2014/04/17/why-investors-are-pouring-millions-into-crowdfunding/>
- Parker, S. C. (2014). Crowdfunding, cascades and informed investors. IZA Discussion Paper No. 7994. Available at SSRN: <http://ssrn.com/abstract=2403130>
- Pierdzioch, C., & Rulke, J. C. (2012). Forecasting stock prices: Do forecasters herd? *Economics Letters*, 116(3), 326–329.
- Qiu, C. (2013). Issues in crowdfunding: Theoretical and empirical investigation on kickstarter. Available at SSRN: <http://ssrn.com/abstract=2345872>
- Riedl, C., Blohm, I., Leimeister, J. M., & Krcmar, H. (2013). The effect of rating scales on decision quality and user attitudes in online innovation communities. *International Journal of Electronic Commerce*, 17(3), 7–36.
- Trevolta. (2014). What is this all about, again? Retrieved October 20, 2014, from <http://www.trevolta.com/faq>
- Veall, M. R., & Zimmermann, K. F. (1996). Pseudo-R<sup>2</sup> measures for some common limited dependent variable models. *Journal of Economic Surveys*, 10(3), 241–259.
- Ye, Q., Cheng, Z., & Fang, B. (2013). Learning from other buyers: The effect of purchase history records in online marketplaces. *Decision Support Systems*, 56, 502–512.
- Yum, H., Lee, B., & Chae, M. (2012). From the wisdom of crowds to my own judgment in microfinance through online peer-to-peer lending platforms. *Electronic Commerce Research and Applications*, 11(5), 469–483.
- Zheng, H. C., Li, D. H., Wu, J., & Xu, Y. (2014). The role of multidimensional social capital in crowdfunding: A comparative study in China and US [Article]. *Information and Management*, 51(4), 488–496.
- Zvilichovsky, D., Inbar, Y., & Barzilay, O. (2014). Playing both sides of the market: Success and reciprocity on crowdfunding platforms. Available at SSRN: <http://ssrn.com/abstract=2304101>

# Enriching Travel Guidebooks with Travel Blog Entries and Archives of Answered Questions

Kazuki Fujii, Hidetsugu Nanba, Toshiyuki Takezawa, and Aya Ishino

**Abstract** Travellers planning to visit particular tourist spots need information about their destination and they often use travel guidebooks to collect this information. However, guidebooks lack specific information, such as first-hand accounts by users who have visited the specific destination. To compensate for the lack of such information, we focused on travel blog entries and archives of answered questions. In this paper, we propose a method for enriching guidebooks by matching and aligning the information with blog entries and questions answered (QA) archives. This is a three-step method. In Step 1, we classify pages of guidebooks, blog entries, and QA archives into five types of content, such as “watch,” “dine,” etc. In Step 2, we align each blog entry and QA archive with guidebooks by taking these content types into account. In Step 3, we match each blog entry and QA archive with individual pages in guidebooks. We conducted some experiments, and confirmed the effectiveness of our method.

**Keywords** Travel guidebook • Blog • QA archive

## 1 Introduction

Travellers planning to visit particular tourist spots need information about these tourist destinations, and they often use travel guidebooks to collect this information. Guidebooks give basic information about famous tourist spots, souvenir shops, and restaurants. As another method to collect the information, there are portal sites that are operated by travel companies and local governments for the benefit of the tourist. However, as there are also sites that are not updated frequently and there are large differences in the amount of information on each tourist destination, many travellers use guidebooks to get basic information.

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Travellers who read guidebooks only get basic information from them and cannot determine how to travel between the destinations listed in the guidebooks or at which hotel to stay with their family. To help travellers read guidebooks, we focused on travel blog entries and archives of questions answered (QA), both of which contain valuable information, such as first-hand accounts by users who have visited the particular destination. In addition, blog entries and QA archives have more descriptive content than other SNSs, such as twitter or various review sites. Therefore, blog entries and QA archives are considered useful information sources for obtaining travel information.

In this paper, we propose a method for enriching guidebooks by matching them against blog entries and QA archives. In addition, we constructed a prototype system that enables guidebook enrichment. By using our system, users can obtain basic information from guidebooks and valuable information based on the personal experiences of travellers from blog entries and QA archives.

The remainder of this paper is organized as follows. Section 2 shows the system behaviour in terms of snapshots. Section 3 discusses related work. Section 4 describes our method. To investigate the effectiveness of our method, we conducted some experiments, and the experimental results are reported in Sect. 5. We present some conclusions in Sect. 6.

## 2 System Behaviour

In this section, we describe our prototype system, which can provide enriched guidebooks. For scanned and OCR-processed guidebooks, our system matches blog entries and QA archives to each guidebook page automatically.

Figure 1 shows an example of a page of an enriched guidebook; it gives details about tourist spots and accommodation facilities on *Kakeromajima* Island. In this figure, when a user clicks the “Blog” button (1), a list of blog entries related to the guidebook page is shown. In the same way, when a user clicks the “QA” button (2), all QA archives related to the guidebook page are shown. Figure 2 is an example of a QA archive that was aligned with the guidebook page shown in Fig. 1. In this archive, the questioner asked recommendation of guesthouses in *Kakeromajima* Island. For this question, the answerer recommended guesthouses in *Ukejima* Island near to *Kakeromajima*. Users of our system can know basic information from guidebooks, while additional valuable information from blog entries and QA archives, which were automatically aligned by our system.

There are several travel portals, such as “Rakuten Travel (<http://travel.rakuten.co.jp/>)” and restaurant review sites, such as “Tabelog (<http://tabelog.com/>).” Although these sites provide customer reviews, we focus on blog entries and QA archives, because they contain a lot of valuable information such as follows.

- Local information provided by local people, most of which are not written in guidebooks.



Fig. 1 An example of a page of an enriched guidebook. This page gives details about Kakeromajima Island in Japan



Fig. 2 An example of an automatically aligned QA archive for the guidebook page shown in Fig. 1

- Tourist spots or events influenced by transportation. (e.g. “I don’t recommend to elderly people, because we need to go up and down a hill a couple of times.”)
- Unrecommended information, such as shown in Fig. 2.

### 3 Related Work

In this section, we introduce some studies on enriching texts. Textbooks used in developing regions are largely text-oriented and lack good visual materials. Therefore, Rakesh, Sreenivas, Anitha, and Kishnaram (2011) proposed a method that enhances the quality of textbooks by assigning images in Wikipedia to each section in textbooks. Nie, Wang, Gao, Zha, and Chua (2013) proposed a method that is able to enrich textual answers in QA archives. For some questions, such as “*What are the steps to make a weather vane,*” textual answers may not provide sufficient natural and easy-to-grasp information. Therefore, they automatically provide accompanying videos and images that visually demonstrate the process of the objects. Lu, Pang, Hao, and Zhang (2009) proposed a method to visualize textual travel blog with images. Bressan, Csurka, Hoppenot, and Renders (2008) proposed a travel blog assistant system that facilitated the travel blog writing by selecting for each blog paragraph the most relevant images from an image set.

All these works focused on enriching texts by multimedia data for supporting to understand the texts, while we focus on enriching multimedia data (guidebooks including both texts and images) with other textual data, such as QA archives and blogs. Especially significant characteristic of our work is that our target data are printed guidebooks, because our method is easily applicable to any printed materials, and has a potentiality to enrich them.

### 4 Enriching Guidebooks with Blog Entries and QA Archives

We propose a method for enriching guidebooks by aligning the content with blog entries and QA archives. In this section, we describe our method for implementing this alignment. The procedure of our method consists of the following three steps.

Step 1: Content-type (see Table 1) classification of guidebook pages, blog entries, and QA archives. One guidebook page is aligned with blog entries and QA archives, which have the same content type as the guidebook page. The results of the content-type classification are used in Step 3.

**Table 1** Content types and their descriptions

Content Type	Criterion
Watch	Page about sightseeing for watching enjoyment
Experience	Page about experience (scuba diving, dance)
Buy	Page about shopping or souvenir stores
Dine	Page about drinking and dining
Stay	Page about accommodation
Other	None of the above applies to this page



Step 2: Alignment of blog entries and QA archives with a guidebook.<sup>1</sup>

Step 3: Alignment of blog entries and QA archives with a guidebook page, having the same content-type, which was determined in Step 1. The results of Step 3 are the final output for enriched guidebooks.

These steps are described in detail in Sects. 4.1–4.3, respectively.

## ***4.1 Content-Type-Classification of Guidebook Pages, Blog Entries, and QA Archives***

### **4.1.1 Definition of Content Types**

Generally, each guidebook page contains travel information in several content types, such as sightseeing spots, souvenir shops, or accommodation. Each guidebook page can be classified into one of the six content types that are typical for tourism (Table 1).

It is possible to supplement a guidebook page with more relevant information by aligning blog entries and QA archives that have the same content type as the guidebook page.

The information published in guidebook pages was mainly content of type “watch,” “experience,” “buy,” “dine,” and “stay.” We defined guidebook pages that did not belong to these content types as content type “other.” Guidebook pages that were judged to belong to “other” contain a lot of information, not all of which is directly related to tourist destinations, for example, advertisement pages, transportation information for arriving at the tourist destination, and also how to get a passport. Therefore, we align blog entries and QA archives that have the same content type as the guidebook pages with the guidebook pages that were classified into “watch,” “experience,” “buy,” “dine,” or “stay.” We classify guidebook pages, blog entries, and QA archives into each content type listed in Table 1, other than content type “other,” to take advantage of alignment. Guidebook pages of each content type have already been published; however, it is not realistic to classify them manually because guidebooks are updated on a regular basis. Hence, guidebook pages were also subjected to automatic content-type classification. A guidebook page was classified into “watch” and “buy” if it contained information about “watch” and “buy.” Blog entries and QA archives were also treated similarly. It is considered that by performing such a content-type classification, we can align blog entries and QA archives of appropriate content type even if the guidebook page was classified into several types.

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<sup>1</sup> We employed a coarse-to-fine alignment, that is to align in a coarse (guidebook) level (Step 2), then in a fine (page) level (Step 3).



For content-type classification, we employed a machine-learning technique using text information and image information; these are explained in Sects. 4.1.2 and 4.1.3, respectively.

#### 4.1.2 Content-Type-Classification Using Text Information

In a guidebook page belonging to “watch,” words such as “display” and “museum” appeared frequently. A page judged as belonging to “experience” contained words such as “instructor” and “beginner.” Namely, the guidebook page, which was classified into each content type, tended to contain words specific to the content type. Moreover, words in guidebooks that were not judged as “watch,” “experience,” “buy,” “dine,” or “stay,” were used as the words specific to the content type “other.” Therefore, we collected words that were peculiar to each content type for machine learning, and employed information gain (IG)<sup>2</sup> as the feature selection method.

Our method computed the value of the words in each content type by the IG. The words used were nouns, verbs, and adjectives. In addition, out of these words, we removed stop words longer than 15 letters, shorter than 2 letters, alphanumeric characters, and words with appearance frequency of less than two. We used MeCab (<http://mecab.sourceforge.net/>) as a Japanese, morphological analysis tool to identify the part of speech. We collected cue words that have a value over the threshold of the IG. The threshold value was determined by the preliminary experiment. In the same way, we collected cue words from blog entries and QA archives.

#### 4.1.3 Content-Type-Classification Using Image Information

Guidebooks contain many images. For example, pages judged to belong to content-type “watch” may include many images of mountains or seashores. Pages judged as belonging to content-type “dine” may include many images of various foods. For this reason, we assumed that images were good clues for classifying the content type by analysing what the images contain. Therefore, for the content-type classification of pages of guidebooks, we also employed image information as features for machine learning. We used one guidebook page as one image. We adopted the Bag of Visual Words (BoVW) (Csurka, Dance, Fan, Willamowski, & Bray, 2004) for image information. BoVW represents images by vectors of the frequency of appearance of local features; it is also a popular method for the task of object recognition. BoVW was applied Bag of Words, which represents documents by vectors of appearance frequency of words in natural language processing to images.

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<sup>2</sup>For example, if we collect words that are peculiar to “watch” type, we compare words in type “watch” blog entries with other ones.

First, we extracted local features from the training image data by dense sampling. Second, we extracted local features and performed clustering to create a representative vector (visual word). We opted for k-means as the method for clustering feature vectors of images. The many feature vectors were clustered into 1000 visual words by k-means (1000 visual words were created in a preliminary experiment). Finally, we generated BoVW by histogram by counting the number of occurrences of visual words as an approximation of guidebook pages. BoVW features were generated for each page. The generated features were used for machine learning.

Blog entries also include many images, which are important clues. However, we could not collect images in blog entries in Yahoo! Blog (<http://blogs.yahoo.co.jp/>), because images are embedded by JavaScript, and we were not allowed to crawl from the blog server. For this reason, the type classification in blog entries uses only text information.

## **4.2 Alignment of Blog Entries and QA Archives with Guidebooks**

In this section, we first explain why we employed a coarse-to-fine alignment. Let us consider aligning blog entries and QA archives about *Miyajima* Island with the corresponding page in a guidebook of Hiroshima. The island is located in Hiroshima, but the page does not necessarily include the word “Hiroshima” despite the fact that each page contains information about Hiroshima. In this case, it is difficult to align blog entries and QA archives that are relevant to information for the guidebook’s page contents and for *Miyajima*. Therefore, it is necessary to take account of both global and local contexts of a guidebook for more accurate alignment of a guidebook page with blog entries and QA archives. There is a related work focusing on global and local contexts of a document. He, Pei, Kifer, Mitra, and Giles (2010) removed cited documents from an article, and estimated cited documents from text surrounding the citation or the placeholder. They considered that some parts of the document such as the title and abstract have a global context and allow words related to the article to be extracted. The text surrounding a citation or placeholder comprises local context and allows characteristic words related to the citation to be extracted. They enhanced the precision of estimation of the bibliography by using extracted words. We can consider that our framework is similar to their framework by regarding the local context as one page of the guidebooks. In particular, we consider global context as the words related to the guidebook such as “Hiroshima,” and local context as the words that appear on the guidebook page. Therefore, we first align blog entries and QA archives with the guidebook to improve the precision of alignment, and then align with the guidebook page.

The remainder of this section explains how to align blog entries and QA archives with a guidebook. As the location names of tourist spots frequently appear in blog entries, QA archives, and guidebooks, the appearance of the location name is important for alignment. We align blog entries and QA archives with guidebooks by using the appearance frequency of the location name. To extract location names from guidebooks, blog entries, and QA archives, we used CaboCha (<http://code.google.com/cabochoa/>) as the Japanese syntactic parser.

We used the results of content-type classification in Step 1 to align blog entries and QA archives with the guidebook page. Here, we explain why the results of content-type classification are necessary. Generally, it is known that context has typical content-type constituents. For example, academic articles have typical constituents, namely “background,” “purpose,” “method,” “conclusion,” or “consideration.” Kando (1997) reported on a method that creates an index by using only sentences that have a particular type and found that it is more accurate than the method that uses academic article detail in the task of academic articles retrieval. The constituents of guidebooks are the content types shown in Table 1. We attempted to achieve a more accurate alignment by using the results of content-type classification.

Figure 3 shows how to use the results of content-type classification for aligning blog entries and QA archives with guidebooks. When we selected the guidebooks that were aligned with blog entries classified into “experience,” we used location names that were extracted from the blog entries and the guidebook page having the same content-type, “experience.” A similar flow of operations was performed in the case of other content types: “buy,” “watch,” “dine,” and “stay.” Using extracted location names for aligning blog entries and QA archives with the guidebook page, we proposed two methods, namely the k-Nearest Neighbour (KNN) method and the Support Vector Machines (SVM) method. In the KNN method, we used the

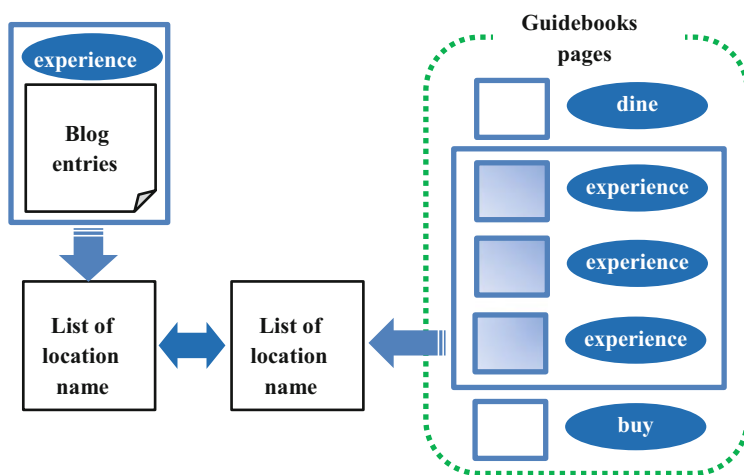


Fig. 3 Alignment of blog entries with guidebook pages using content-type classification

SMART measure to calculate the similarity between guidebooks and blog entries or QA archives. Blog entries and QA archives can be aligned with the guidebook page when the similarity is higher than the threshold. The threshold was determined to be the value when the recall was above 15 % and the precision was the highest in training data by the twofold cross-validation test. In the SVM method, we constructed models for each guidebook. Models classify whether intended blog entries and QA archives can be aligned with guidebooks.

### ***4.3 Alignment of Blog Entries and QA Archives with a Guidebook Page***

We extracted location names from guidebooks, blog entries, and QA archives, and then calculated the similarity between them for the same content type and aligned with the guidebook page having the highest similarity. The similarity calculation uses the cosine degree. We used the  $tf*idf$  for term weighting. The  $idf$  scores were calculated by using the number of hits in the web search engine.

## **5 Experiments**

We conducted three experiments: (1) content-type classification of pages of guidebooks, blog entries and QA archives, (2) alignment of blog entries, and QA archives with guidebooks, and (3) alignment of blog entries and QA archives with pages of guidebooks. We report on these in Sects. 5.1–5.3, respectively.

### ***5.1 Content-Type-Classification of Guidebook Pages, Blog Entries, and QA Archives***

#### **Datasets and Experimental Setting**

We used 2897 pages of 20 guidebooks, 1000 blog entries that were collected by the method of Nanba et al. (2009), and 9388 QA archives registered in the “region/travel” category of Yahoo! Answers. Then we classified them manually, and used them for our examination. It is possible to classify a guidebook page, blog entry, and QA archive into more than one content type. Table 2 shows the number of each content type. We performed a twofold cross-validation test. We used TinySVM (<http://chasen.org/~taku/software/TinySVM/>) software as the machine-learning package, and precision and recall as evaluation measures. Here, precision is the fraction of classified instances that are relevant, and precision is the fraction of relevant instances that are classified. We considered that precision is more

**Table 2** The number of pages of guidebooks, blog entries, and QA archives for each content-type

Content Type	Guidebook	Blog	QA Archive
Watch	102	395	620
Experience	78	241	412
Buy	418	163	191
Dine	741	382	502
Stay	278	134	257
Other	975	193	7888

important than recall because there are a large number of blog entries and QA archives on the web, and low recall would not become a serious matter in our case. In addition, misclassification of content-type causes wrong alignment of blog entries and QA archives.

### Experimental Methods

To investigate the effectiveness of our method, we classified content types using the following four methods.

- The IG method: Used cue words collected by IG as features for machine learning.
- The IG + BoVW method: Used cue words collected by IG and BoVW as features for machine learning for guidebooks.
- BoVW method: Used BoVW as features for machine learning.
- Baseline method: Used all words that appeared in datasets.

### Results and Discussion

The evaluation results for the content-type classification of pages of guidebooks, blog entries, and QA archives are shown in Tables 3, 4, and 5. In Table 3, “-” indicates that we could not conduct machine learning because of the lack of training data. As shown in Tables 3, 4, and 5, the IG method obtained high precision in each dataset. However, the average precision score of blog entries was smaller than that of guidebooks and QA archives. Blog entries use informal expressions more frequently than guidebooks and QA archives. Therefore, we considered that the method based on cue words could not obtain high precision. To investigate the validity of this guess, we calculated the unique word ratio in guidebooks, blog entries, and QA archives, using the following.

$$\text{Unique word Ratio} = \frac{\text{the number of unique words in the content}}{\text{the total number of words in the content}}$$

The unique word ratio of guidebooks, blog entries, and QA archives was 0.082, 0.112, and 0.078, respectively. The unique word ratio of blog entries was higher than that unique word ratio of guidebooks or QA archives. It is considered that words that seldom appear in training data appear frequently in test data, if the unique word ratio is high. In addition, the number of blog entries that were classified manually into “buy” and “stay” is too small to train. That is, the IG

**Table 3** Evaluation results for content-type classification of pages of guidebooks

Feature	Measure	Watch	Experience	Buy	Dine	Stay	Average
Word (Baseline)	Precision	46.0	16.9	25.1	41.7	39.1	46.9
	Recall	53.6	15.4	23.3	49.2	17.0	30.9
IG	Precision	73.3	91.7	81.5	80.5	74.0	75.6
	Recall	32.1	17.0	20.0	32.4	32.8	27.9
IG + BoVW	Precision	74.1	91.7	76.2	77.6	75.4	75.8
	Recall	37.3	17.0	28.7	35.3	36.8	33.7
BoVW	Precision	61.9	–	–	72.0	–	–
	Recall	14.7	–	–	5.6	–	–

**Table 4** Evaluation results for content-type classification of blog entries

Feature	Measure	Watch	Experience	Buy	Dine	Stay	Average
Word (Baseline)	Precision	68.4	55.3	50.7	75.1	49.8	66.4
	Recall	60.6	37.0	20.8	67.4	19.2	48.7
IG	Precision	66.7	60.2	54.9	77.2	58.9	65.9
	Recall	64.0	33.7	31.8	69.9	34.3	51.0

**Table 5** Evaluation results for content-type classification of QA archives

Feature	Measure	Watch	Experience	Buy	Dine	Stay	Average
Word (Baseline)	Precision	72.7	56.6	77.5	72.2	82.0	70.9
	Recall	70.6	43.3	41.7	69.6	65.4	61.1
IG	Precision	71.1	81.4	90.1	71.8	90.8	80.7
	Recall	44.4	11.9	33.3	47.5	20.4	32.4

method cannot cyclopedically collect cue words, and improve the precision of content-type classification in blog entries.

## 5.2 Alignment of Blog Entries and QA Archives with Guidebooks

### Datasets and Experimental Setting

We used 90 guidebooks, 1000 blog entries, and 1998 QA archives. A guidebook was aligned manually with blog entries and QA archives that were thought to be related to the guidebook. We used precision and recall as evaluation measures.

### Experimental Methods

To investigate the effectiveness of our methods, we conducted tests using the following. The KNN\_TYPE method was only used for results of content-type classification. This experiment used results of the content type that were obtained by the IG + BoVW method for the guidebook page and the IG method for blog

entries and QA archives. Except for the KNN\_TYPE method, the methods did not use the results of content-type classification.

- KNN\_TYPE: Calculated the similarity by KNN using the appearance frequency of location names. Location names were extracted from datasets of travel guidebooks, travel blog entries, and QA archives having the same content type.
- KNN\_LOC: Calculated the similarity by KNN using the appearance frequency of location names. Location names were extracted from the datasets regardless of the content type.
- BASE\_KNN: Calculated the similarity by KNN using the appearance frequency of nouns extracted from the datasets.
- BASE\_SVM: Used SVM. Features were the appearance frequency of nouns extracted from the datasets.

## Results and Discussion

The evaluation results are shown in Tables 6 and 7. As can be seen from these tables, the KNN methods were more useful than the SVM methods. The KNN\_TYPE method obtained the best performance. It had high precision but low recall. However, the low recall was not a serious matter in this case, because the KNN\_TYPE method could align 99 blog entries and 1561 QA archives for a guidebook page, when applying our method to real datasets. We considered that precision was more important than recall, because enriching guidebooks having appropriate information was more beneficial than enriching guidebooks having incorrect information. Our methods allow the flexible alignment of appropriate information with guidebooks by using location names and results of content-type classification. Therefore, it is possible to align with blog entries and QA archives, which have various information if the recall will low.

The main cause of the failure was that location names, which were not the destination of the trip, were extracted from blog entries and QA archives. This was because of the use of CaboCha, which is the Japanese syntactic parser, for extracting location names from datasets. These web contents contain location names before moving, such as the traveller's home.

**Table 6** Evaluation results for an automatically aligned blog entry for a guidebook

		Precision	Recall
Our methods	KNN_TYPE	81.1	20.4
	KNN_LOC	76.7	20.1
Baseline methods	BASE_KNN	27.3	15.5
	BASE_SVM	21.6	3.0

**Table 7** Evaluation results for an automatically aligned QA archive for a guidebook

		Precision	Recall
Our methods	KNN_TYPE	85.8	21.0
	KNN_LOC	78.3	20.6
Baseline methods	BASE_KNN	48.7	16.6
	BASE_SVM	40.5	18.4

### 5.3 *Alignment of Blog Entries and QA Archives with a Guidebook Page*

#### **Datasets and Experimental Setting**

We performed experiments that aligned 100 blog entries and 100 QA archives with 90 guidebooks.

#### **Experimental Methods**

To investigate the effectiveness of our method, we conducted tests using the following methods. Our methods selected guidebooks that were aligned with blog entries and QA archives by Step 2. In this experiment, we used guidebooks that were aligned manually with blog entries and QA archives by the KNN\_TYPE method of Sect. 5.2.

- Our method 1 (coarse-to-fine, without content type): We selected guidebooks that were aligned with blog entries and QA archives by the KNN\_TYPE method described in Sect. 5.2. We calculated cosine similarity between selected guidebook pages and blog entries or QA archives, and aligned them with the guidebook page having the highest similarity.
- Our method 2 (coarse-to-fine, with content type): We selected guidebooks that were aligned with blog entries and QA archives by the KNN\_TYPE method. We calculated cosine similarity between the selected guidebook pages and blog entries of the same content type as the guidebook pages or QA archives, and aligned them with the guidebook page having the highest similarity.

Baseline method (not coarse-to-fine, without content type): Calculated the cosine similarity between the guidebook pages and blog entries or QA archives. Blog entries and QA archives were aligned with the guidebook page having the highest similarity.

#### **Evaluation Methods**

We used a questionnaire survey as the evaluation method. The questionnaire contents asked whether blog entries and QA archives that were aligned with the guidebook page were “Appropriate” or not for travellers collecting information. Each guidebook page was judged by 11 judges. The evaluation results for each guidebook page were decided by a majority vote.

#### **Results and Discussion**

The questionnaire results are shown in Table 8, and indicate that our method could appropriately align blog entries and QA archives with guidebook pages. For the results of blog entries, our methods 1 and 2 obtained better results than the baseline

**Table 8** Ration of enriched guidebook pages that were judged to be “Appropriate”

Method	Blog Entry (%)	QA Archive (%)
Baseline method	72	53
Our method 1	82	57
Our method 2	82	77



method. Therefore, our method that determines a guidebook-related blog entry first and then aligns the blog entry with the guidebook page could align more appropriately than the baseline method that aligns a blog entry with a guidebook page at one time. There was not much difference between our methods 1 and 2 because most blog entries had been written about lots of things and had been classified into multiple content types.

In the results for QA archives, our method 2 gave the best performance. QA archives had posted questions focusing on specific content types such as “Could you recommend a restaurant in [location name]?” Therefore, the method that used the results of content-type classification was effective when QA archives were aligned with the guidebooks.

## 6 Conclusions

In this paper, we proposed a method for enriching guidebooks by aligning them with blog entries and QA archives. We conducted three experiments: (1) content-type classification of guidebook pages, blog entries, and QA archives, (2) alignment of blog entries and QA archives with guidebooks, and (3) alignment of blog entries and QA archives with a guidebook page. In the experiment (1), we found that our method using both textual and image information (IG + BoVW) obtained the best performance. In the experiment (2), our method KNN\_TYPE obtained best precision scores in both aligning with blog entries and QA archives. In the experiment (3), judges considered 82.0 % of blog entries and 77.0 % of QA archives to be helpful in our method 2 (coarse-to-fine, with content type). With these steps, it was possible to align relevant information with pages of guidebooks and help travellers collect tourist information. We mentioned the method for enriching guidebooks by SNS, but we can easily apply this method to various other documents, such as travel leaflets or booklets.

## References

- Bressan, M., Csurka, G., Hoppenot, Y., & Renders, J. M. (2008). Travel blog assistant system (TBAS) – An example scenario of how to enrich text with images and images with text using online multimedia repositories. *Proceedings of VISAPP Workshop on Metadata Mining for Image Understanding*.
- Csurka, G., Dance, C. R., Fan, L., Willamowski, J., & Bray, C. (2004). Visual categorization with bags of keypoints. *Proceedings of ECCV International Workshop on Statistical Learning in Computer Vision*, pp. 1–22.
- He, Q., Pei, J., Kifer, D., Mitra, P., & Giles, C. L. (2010). Context-aware citation recommendation. *Proceedings of the 19th International WWW Conference*, pp. 421–430.
- Kando, N. (1997). Text-level structure of research papers: Implications for text-based information processing systems. *Proceedings of British Computer Society Annual Colloquium of Information Retrieval Research*, pp. 68–81.

- Lu, X., Pang, Y., Hao, Q., & Zhang, L. (2009). Visualizing textual travelogue with location-relevant images. *Proceedings of the 2009 International Workshop on Location Based Social Networks*, pp. 65–68.
- Nanba, H., Taguma, H., Ozaki, T., Kobayashi, D., Ishino, A., & Takezawa, T. (2009). Automatic compilation of travel information from automatically identified travel blogs. *Proceedings of Joint Conference of the 47th Annual Meeting of the Association for Computational Linguistics and the 4th International Joint Conference on Natural Language Processing*, pp. 205–208.
- Nie, L., Wang, M., Gao, Y., Zha, Z.-J., & Chua, T.-S. (2013). Beyond text QA: Multimedia answer generation by harvesting web information. *IEEE Transactions on Multimedia*, 15(2), 426–441.
- Rakesh, A., Sreenivas, G., Anitha, K., & Kishnaram, K. (2011). Enriching textbooks with images. *Proceedings of the 20th ACM Conference on Information and Knowledge Management*, pp. 1847–1856.

# The ‘Selfie Gaze’ and ‘Social Media Pilgrimage’: Two Frames for Conceptualising the Experience of Social Media Using Tourists

Michelangelo Magasic

**Abstract** This paper is concerned with the personal usage of social media to record and share travel experience and the impacts this has upon the practice of travel. It presents two conceptual frames for understanding the use of social media during a journey: firstly, the concept of ‘selfie gaze’ builds on John Urry’s (The tourist gaze: Travel and leisure in contemporary societies. Sage, London, 1990) seminal theory of the “tourist gaze” in order to explain how the presence of a social media audience influences the tourist’s perception of travel. Second, the concept of ‘social media pilgrimage’ highlights how the usage of social media during travel produces a specific set of behaviours which are related to internet usage and the online persona of the traveller. These frames build upon the author’s previous empirical research on social media usage during travel and form part of a larger interpretivistic study into the relationship between online and offline travel texts.

**Keywords** Tourism social media • Tourist gaze • Travel blog • Travel experience • Selfie

## 1 Introduction

The inspiration for this paper comes from the desire to understand how travel is documented in online accounts and what values and ideals online travel texts represent. Blogs are an established part of the contemporary travel experience and their potential to act as a portal through which to view the collective behaviour of travellers has been recognised by Pudliner (2007), who states: “Blogs are a visual and written descriptive of the day to day excursion of a tourist society” (p. 46). However, travel blogs cannot simply be read in the same way as previous generations of travel texts as their medial format requires new literacies which are only now unfolding as our understanding of the personal processes involved in social media usage improves (Banyai, 2012; Banyai & Havitz, 2013). The idea of

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ubiquitous device usage and constant connection dramatically changes previous conceptions of the travel experience (Molz & Paris, 2015), meaning that the behaviours and texts of modern tourists need to be read in the light of new technological and social conditions (Miller, 2013).

The increasing normalisation of device usage during travel has in recent years began to be investigated under the phrase 'social media tourism'. Social media tourism is an emergent mode of travel in which the journeyer uses a suite of different social media applications that intersect with, support, or augment the process of journeying (Munar, Gyimóthy, & Cai, 2013). Giving some indication as to the variety and different purposes of the social media platforms likely to complement the travel experience, Munar and Gyimóthy (2013) relate: "Tourists share their travel images on Flickr, upload videos to YouTube, write personal stories on Travelblog, provide reviews on TripAdvisor, and publish updates about their tourism experience on Facebook" (p. 2). Participating in these different social media platforms while on the road changes the travel experience. As blogs are a "social genre" (Rettberg, 2008, p. 57) the practice of writing necessitates a regular connection to the internet to maintain relationships and monitor feedback. Furthermore, the interfaces of social media platforms greet the user with an ever-updated stream of information about the lives and actions of their social networks (Senft, 2013). The connectivity provided by social media worlds has been theorised as producing a reduction in the liminality of the travel experience (White & White, 2005), and concurrently, a stronger attachment to work and home worlds (Munar, 2013). Testifying as to the transformative effect of digital technologies upon the temporal and spatial dimensions of travel, Molz and Paris (2015) explain: "As new technologies reconfigure the spatial and temporal parameters of social life, we can no longer say that being together is the opposite of being apart, or that being away necessarily means that one is absent" (p. 180).

Digital technology fills a range of informational and communicative purposes within travel and changes not only the way that travel is experienced but also how it is recorded. The connectivity provided by social media enabled devices can be seen to mediate the travel experience as the traveller is cognizant of the audience's impressions of their journey (Wang, Park, & Fesenmaier, 2012) and seeks to appease audience expectations within their creation of online travel content (Magasic, 2014). While current academic studies have highlighted instances where the creation of online travel content has been inspired by altruistic or communitarian factors (Munar & Jacobsen, 2014; Yoo & Gretzel, 2011), it is also worth considering that travel content is often uploaded as a means of accruing social capital, particularly within personal social media platforms. A recent study undertaken by Trip Advisor ([www.tripadvisor.com](http://www.tripadvisor.com) [Oct. 22, 2013]) reports that 19 % of global travellers use social media during travel in order to brag about their trip to their social media contacts. This data suggests that in-travel social media usage follows the same patterns of self-performance and status seeking found in social media usage in general (Marwick & Boyd, 2011a, 2011b; Papacharissi, 2012).

Given the ubiquitous presence of smartphones within our life and travel worlds, and the ever-increasing spread of network connectivity around the world, attention to how the use of digital technologies interfaces with the travel experience is providing new ways of imagining travel. One salient example can be seen through the ascension of the image within digitally mediated communication and the burgeoning role of amateur created images as a medium for representing travel experience. Examining a selection of user-created images featured in an online *New York Times* photo competition, the researcher Katie Day Good (2013) concludes that contemporary travel can be seen as a *mélange* of “enduring” and “emergent” tropes. Day Good’s reading highlights the fact that traditional tourism theory cannot fully address the influence of new technologies on travel with some ideas like tourism’s interest in “authenticity” (MacCannell, 1989) proving ongoing, but others, such as travel necessarily being a journey outside home space, being shown as untenable. Here, this paper presents two conceptual frames for understanding the digitally connected tourist. These frames combine existing tourism theory with concepts from social media study such as Goffmanian theories of performance and “presentation of self” (Goffman, 1959) and are intended to work in tandem. The ‘selfie gaze’ is introduced as a paradigm, that is, a way of describing the mental frame governing the use of social media within travel, while the second frame, ‘social media pilgrimage’ examines the specific set of behaviours engendered by the contemporary tourist’s selfie gaze.

## 2 The ‘Selfie Gaze’

Numerous modern philosophers such as Satre, Lacan and Foucault have utilised the concept of ‘the gaze’ in order to describe a structured way of seeing which privileges certain values over others. Within a tourism context, Urry (1990) introduced the idea of the “tourist gaze” in order to explain the consumptive, post-colonial behaviours of (male) tourists and their interaction with locals at visited places. Urry believes that the tourist gaze is perpetuated by dominant institutions in society including the tourism industry, citing Berger on the following point: “The ‘tourist gaze’ is not a matter of individual psychology but of social pattern and learnt ‘ways of seeing.’” (Urry & Larsen, 2011, p. 2). The tourist gaze is then a learned social activity that is practised by all tourists and is indeed an integral part of being a tourist. In recent years, however, the ascension of the internet as a means for disseminating information has diversified the conditions under which people learn about tourism. In the Web 2.0 era, the tourist gaze has met the interconnected world of the participatory internet in which amateur traveller’s journeys and experiences of cultural difference are uploaded to be consumed by a worldwide audience (Gretzel, Fesenmaier, Lee, & Tussyadiah, 2011). This means two things: firstly, the traveller is no longer simply content to gaze passively at sites dictated to them by taste-makers and can now easily participate in the meaning of tourist sites by sharing their own experiences online (Kang & Gretzel, 2012; Pera, 2014); and,

secondly, because tourists are aware of the fact that there is a potentially unlimited online audience for their uploaded travel texts, following Foucault's (1975) reading of the panopticon, their travel behaviour must reflect this.

In his paper outlining the increasingly media driven experience of tourism at the dawn of the new millennium (notably, before the era of social media), Jansson (2002) states that, "the tourist gaze has become more and more intertwined with the consumption of media images" (p. 431). While experiences of tourism may indeed still be driven by, as Jansson believes, "the tourism industry or by the culture industry at large" the introduction of social media into the tourist experience has given tourists the ability to answer back to the representations behind the tourist gaze and to easily create and disseminate their own interpretations of the tourist experience. In the past decade of social media adoption and usage, one of the most apparent consumer behaviours that has developed is the ascension of the photographic image as a mode of everyday self-expression. In recent years, the phenomena of the selfie, in which the camera is turned upon the taker as a mode of self-presentation, has become a ubiquitous communicative event (Rettberg, 2014; Senft & Baym, 2015). Given travel's connotations of high status and self-improvement (Pudliner, 2007; Youngs, 2013), the travel selfie has likewise proven a popular way through which to develop one's online identity. Indeed, recent studies by the travel organisations Wotif ([www.wotif.com](http://www.wotif.com) [Aug. 26, 2014]) and The Flash Pack ([www.flashpack.co.uk](http://www.flashpack.co.uk) [July 20, 2014]) indicate that the sharing of travel media is one of the most consistent practices of the travel experience, considered by tourists a vital function of the pre, during and post stages of the trip.

While social media has activated the tourist gaze and allowed it to speak back toward tourist institutions, it has likewise created a gigantic audience for the mundane and previously private experiences of tourism (Munar & Jacobsen, 2014). Online travel texts are public, prolific and subject to the conditions of the network including shareability and virality (Lovink, 2011). The tendency of our online self-presentation to maximize benefit and minimize risk (Papacharissi, 2012) means that we are likely to try and appease the crowd with our online representations of travel. Thus, as our journeys are increasingly uploaded within the eyes and scrutiny of others, we will seek out elements of the landscape which we think will be approved by the imagined online audience. This is indeed unsurprising if we considered Foucault's (1975) dissection of the conceptual nineteenth century prison, the panopticon. This structure placed the prisoners in a position in which they were always visible by the guards, though unaware whether they were under the surveillance or not, in order to coerce appropriate behaviour. Foucault's conclusion that we change our behaviour when we are, or think we are, under the scrutiny of others might also be applied to the current social media era as we enact certain performances because our online self-presentation may be viewed by a potentially unlimited audience.

Given the portentous role that selfies play as an avatar of self-representation, the social media travel era might be theorized as existing within the paradigm of the 'selfie gaze.' The selfie is frequently taken with an audience in mind: we pose, search for our best side and delete less appealing drafts whilst questing for an ideal

image. Cognizant of the online audience, the digitally connected traveller's selfie gaze searches for sites that will improve the traveller's esteem in the eyes of their social networks. It is implicitly aware of the potential connectivity of the people and spaces which surround it with global trends providing short lived avenues for inspiration and status accrual, and tagging a means of collective communication. The selfie gaze can thus be read as privileging the following values:

## **2.1 *Surveillance***

Online platforms collapse the boundaries between public and private meaning that social media users carefully balance exposure with privacy costs when sharing material online (Papacharissi, 2012). The capacity for sharing and virality means that there is a potentially unlimited audience for material shared online (Lovink, 2011; Senft & Baym, 2015). The user must consider the personal, professional and social implications of their posts, both present and future.

## **2.2 *(Micro) Celebrity***

The tourist is able to build social esteem by the sharing of appropriate content. Within the presentation outlet of social media, users engage in micro-celebrity practices. Marwick and Boyd (2011a) explain that "Micro-celebrity can be understood as a mindset and set of practices in which audience is viewed as a fan base; popularity is maintained through ongoing fan management; and self-presentation is carefully constructed to be consumed by others." (p. 140). Esteem is built following the attention economy and properties of exposure (Goldhaber, 1997), while the counters for 'friends', 'followers', 'likes' and 'shares' commonly available within social media platforms provide a "quantifiable metric for social success." (Marwick & Boyd, 2011b, p. 127).

## **2.3 *Omnivorous Voice***

The aim of posting is extrinsically motivated and aims for mass appeal rather than private memory. The tourist may post easily identifiable tourist images/icons, however, given that these classic tourist sites are overexposed within popular culture, a corollary strategy is to post ironic or playful images that comment upon this. The tourist then adopts an "omnivorous" voice (Day Good, 2013) that mixes elements of high and low culture and appeals to a wide audience. Marwick and Boyd (2011b) explain that: "The large audiences for sites like Facebook or MySpace may create a lowest-common denominator effect, as individuals only

post things they believe their broadest group of acquaintances will find non-offensive.” (p. 122).

### 3 Social Media Use as Pilgrimage

The traveller continues to use social media on vacation and social media use is not separate from but embedded within the practice of travel and forms part of daily touristic routines and experience (Kim & Tussyadiah, 2013; Magasic, 2014). Here, Munar and Gyimóthy (2013) emphasise that the traveller’s practice of recording their travel narrative within social media not only reflects the physical journey but represents an additional online journey, stating, “Social media emphasise the role of fantasy and imagination as part of a fluid tourism experience. This implies a virtual, emotional, and imaginative mode of travel, preceding as well as running parallel with the actual physical journey” (p. 2). This mediated journey is enacted within the traveller’s online “presentation of self” (Goffman, 1959), the process through which the traveller assembles their digital persona. The online journey is constructed of moments captured within the physical journey which are edited in ways that are conversant with the traveller’s ideal self-image as well as the feedback received from the audience. In this way the traveller’s practice of online identity construction is looped back within the physical journey as practices of net use and self-presentation are performed in physical space as part of the routine of social media integrated travel.

In his influential paper, *A Phenomenology of Tourist Experience* the tourism scholar Erik Cohen (1979, pp. 189–191), outlines five ways through which tourist experience may be understood. Among these concepts is the “Existential” frame, which posits the tourist as a “seeker” who is “fully committed to finding an ‘elective’ spiritual centre.” This concept of the “seeker” is productive when applied to the use of social media during travel and the accrual of social capital achieved wherein. Here, the idea of twin, interlocking worlds of physical and mediated journey may be conceptualised as a pilgrimage in which the traveller seeks online recognition in combination with physical experience as a way to maximise the value produced within their travel. While the physical journey does usually have an organised itinerary, the collection of value within is quite unpredictable with some locations being to the tourists’ liking and others not (Wang et al., 2012). On the other hand, the online pilgrimage allows the traveller access to the procedural accrual of social capital via the online attention economy. The traveller’s social media performance is quantified through a number of levels pre-ordained by social networking platforms such as ‘likes’, ‘followers’ and ‘shares’ (Marwick & Boyd, 2011b). Higher numbers in these different categories are perceived as better and indeed some of the platforms such as Tumblr or Wordpress award digital trophies for reaching certain milestones. The “spiritual centre” of the users’ pilgrimage is then ever-higher numbers in the appointed categories, an unending task, as high numbers of followers give higher numbers of attention and the cycle keeps moving



upward. Within this pilgrimage the possibility of becoming a professional or well-recognised blogger provides additional motivation to the social media user (Azariah, 2014).

The traveller's online pilgrimage is enmeshed within the journey through mundane activities like charging electronic devices and time spent searching for and using internet connections which must be performed in order to keep up appearances online. In addition to these is the constant cycle of planning, recording, editing, uploading and monitoring social media products. Given the privileged status of image and self-presentation in online worlds, the traveller is motivated to record images of themselves within suitable spots, and to share these among both known and unknown contacts. The presence of global trends, identifiable through high-profile hashtags or through one's homepage or information feed, may also inspire different physical behaviours such as 'planking' or the 'Ice Bucket Challenge' which offer a way of increasing personal exposure and establishing or deepening relationships with other users. The traveller's social media usage can also be seen to exert a significant influence upon the itinerary of the journeyer, motivating them to visit or forego certain places as is the perceived effect a destination will have on their social media profile (Magasic, 2014). These decisions may be made with little or no planning as audience feedback is given in real time. As contemporary travel is experienced through the frame of immediate pleasure (Jansson, 2002), which is now more predictable, or at least more quantifiable, within social media than real world spaces, the motivation for physical travel (such as decisions on which places to visit) may be increasingly related to audience factors and the performance of the traveller's online pilgrimage.

## 4 Discussion

The conceptual frames discussed within this paper form part of the methodology of a research project comparing online and offline travel narratives. The task of framing online travel narratives as a textual genre necessitates an understanding of how social media is used during travel and also its effects upon the act of journeying. The selfie gaze and social media pilgrimage constitute an experimental lens through which to understand the usage of social media during travel and will be deployed as part of the author's auto-ethnographic research.

The benefits of having a model for understanding the use of social media during travel are manifold. The spatial and affective affordances offered by digitally connected devices change the way travel is experienced and the reasons why it is experienced. A recent report produced by the Intercontinental Hotels Group (2013) highlights the way in which social media tourism adopts an external outlook, stating: "Younger generations no longer travel to 'discover' themselves, but to say something about themselves to their social peers. It may even be that these travellers now think about an experience in terms of how they will share it with others." (p. 28). In this vision, the act of sharing travel experiences becomes a key

part of experiencing travel moments. Here a better understanding of why travellers focus on recording specific scenes and the processes through which these are transcribed (or transformed) into social media content can help tourism organisations to enrich the experience that travellers have when they visit their destination. This idea takes particular focus when considering the current antagonistic relationship between social media using tourists and destinations as seen through such recent events as the banning or criminalisation of selfies at several major European tourist destinations and the deaths of people involved in taking selfies at major touristic locations (Elliot, 2015).

Future research considering the role of social media within the tourist experience would benefit from ethnographic studies into the practice of social media using tourists within different contexts. Research which produces a comparison between the traveller's physical and social media journeys considering factors like destination choice, the sharing of textual and visual content and audience feedback would help to develop the concepts introduced in this paper. Meanwhile, attention needs to be given to the fact that social media is a developing entity and emergent concepts such as selfies function as buzz words and should be treated judiciously.

## 5 Conclusion

The selfie gaze and social media as pilgrimage reflect two separate but interrelated facets of the same cultural paradigm: the integration of social media worlds into the practice of tourism, or, more broadly, the integration of networked informational systems into everyday life. The selfie gaze is used as a frame to describe the traveller's mental state and the current paradigm in which the societal activity of tourism exists. The practice of taking photos of ourselves during day to day life occurs because we know there is an audience out there to view these images. The selfie gaze is the mode of conception which helps us decide when, where and how we produce these self-referential texts. Building on this, the frame of social media as a pilgrimage can be used to explain specific behavioural patterns of social media using tourists. Connection to digital networks provides an immediate source of value collection for connected travellers. The traveller monitors, and reacts to feedback in order to improve their online status. This results in them visiting places recommended by the audience and engaging in routines of internet use during travel time.

## References

- Azariah, D. (2014). From blogger to book author: Examining self-publishing, self-presentation and discourse in travel blogs. Paper presented at *Australia and New Zealand Communication Association Annual Conference*, Swinburne University, Australia, July 9–11, 2014. Retrieved from <http://www.anzca.net/documents/2014-conf-papers/737-anzca14-azariah/file.html>

- Banyai, M. (2012). Travel blogs: A reflection of positioning strategies. *Journal of Hospitality Marketing and Management*, 21(4), 421–439. <http://dx.doi.org/10.1080/19368623.2012.624297>.
- Banyai, M., & Havitz, E. (2013). Analysing travel blogs using a realist evaluation approach. *Journal of Hospitality Marketing and Management*, 22(2), 229–241. <http://dx.doi.org/10.1080/19368623.2012.680239>.
- Cohen, E. (1979). A phenomenology of tourist experiences. *Sociology*, 13(2), 179–201. Retrieved from SAGE Deep Backfile database.
- Day Good, K. (2013). Why we travel: Picturing global mobility in user-generated travel journalism. *Media Culture Society*, 35(3), 295–313. doi:10.1177/0163443712468608.
- Elliot, C (2015, Sep 30). Selfies are dangerous stupid and getting banned. *Fortune*. Retrieved from <http://fortune.com/2015/09/30/selfies-banned-tourists/>
- Foucault, M. (1975). *Discipline and punish: The birth of the prison*. New York, NY: Random House.
- Goffman, E. (1959). *The presentation of self in everyday life*. New York, NY: Anchor.
- Goldhaber, M. H. (1997). The attention economy and the net. *First Monday*, 2(4). Retrieved from: <http://firstmonday.org/article/view/519/440#dep5>
- Gretzel, U., Fesenmaier, D. R., Lee, Y., & Tussyadiah, I. (2011). Narrating travel experiences: The role of new media. In R. Sharpley & P. R. Stone (Eds.), *Tourist experience: Contemporary perspectives* (pp. 171–182). New York, NY: Routledge.
- Jansson, A. (2002). Spatial phantasmagoria: The mediatization of tourism experience. *European Journal of Communication*, 17(4), 429–443. doi:10.1177/02673231020170040201.
- Kang, M., & Gretzel, U. (2012). Effects of podcast tours on tourist experiences in a national park. *Tourism Management*, 33, 440–455. doi:10.1016/j.tourman.2011.05.005.
- Kim, J., & Tussyadiah, I. P. (2013). Social networking and social support in tourism experience. *Journal of Travel and Tourism Marketing*, 30, 78–92. doi:10.1080/10548408.2013.751220.
- Lovink, G. (2011). *Networks without a cause: A critique of social media*. Cambridge, MA: Polity.
- MacCannell, D. (1989). *The tourist: A new theory of the leisure class*. New York, NY: Schocken Books.
- Magasic, M. (2014). Travel blogging: An auto-ethnographic study of how online interactions influence a journey. *First Monday*, 19(7). Retrieved from: <http://firstmonday.org/ojs/index.php/fm/article/view/4887/4098>
- Marwick, A., & Boyd, D. (2011a). To see and be seen: Celebrity practice on Twitter. *Convergence*, 17(2), 139–158. doi:10.1177/1354856510394539.
- Marwick, A., & Boyd, D. (2011b). I tweet honestly, I tweet passionately: Twitter users, context collapse, and the imagined audience. *New Media and Society*, 13(1), 114–133. <http://dx.doi.org/10.1177/1461444810365313>.
- Miller, T. (2013). Tourism and Media Studies 3.0. In Munar, A., Gyimóthy, S. & Cai, L. (Eds.), *Tourism social media: Transformations in identity, community and culture* (pp. 229–243). [http://dx.doi.org/10.1108/S1571-5043\(2013\)0000018015](http://dx.doi.org/10.1108/S1571-5043(2013)0000018015)
- Molz, J., & Paris, C. (2015). The social affordances of flashpacking: Exploring the mobility nexus of travel and communication. *Mobilities*, 10(2), 173–192. doi:10.1080/17450101.2013.848605.
- Munar, A. (2013). Paradoxical digital worlds. In Munar, A., Gyimóthy, S. & Cai, L. (Eds.), *Tourism social media: Transformations in identity, community and culture* (pp. 35–53). [http://dx.doi.org/10.1108/S1571-5043\(2013\)0000018005](http://dx.doi.org/10.1108/S1571-5043(2013)0000018005)
- Munar, A. & Gyimóthy, S. (2013). Critical digital tourism studies. In Munar, A., Gyimóthy, S. & Cai, L. (Eds.), *Tourism social media: Transformations in identity, community and culture* (pp. 245–262). [http://dx.doi.org/10.1108/S1571-5043\(2013\)0000018016](http://dx.doi.org/10.1108/S1571-5043(2013)0000018016)
- Munar, A., Gyimóthy, S. & Cai, L. (2013). Tourism social media: A new research agenda. In Munar, A., Gyimóthy, S. & Cai, L. (Eds.), *Tourism social media: Transformations in identity, community and culture* (pp. 1–15). [http://dx.doi.org/10.1108/S1571-5043\(2013\)0000018003](http://dx.doi.org/10.1108/S1571-5043(2013)0000018003)

- Munar, A., & Jacobsen, J. (2014). Motivations for sharing tourism experiences through social media. *Tourism Management*, 43, 46–54. <http://dx.doi.org/10.1016/j.tourman.2014.01.012>.
- Papacharissi, Z. (2012). Without you, I'm nothing: Performances of the self on Twitter. *International Journal of Communication*, 6, 1989–2006. Retrieved from: <http://ijoc.org/ojs/index.php/ijoc/article/view/1484/775>.
- Pera, R. (2014). Empowering the new traveller: Storytelling as a cocreative behaviour in tourism. *Current Issues in Tourism*. doi:10.1080/13683500.2014.982520.
- Pudliner, B. A. (2007). Alternative literature and tourist experience: Travel and tourist weblogs. *Journal of Tourism and Cultural Change*, 5(1), 46–59. doi:10.2167/jtcc051.0.
- Rettberg, J. W. (2008). Blogs, literacies and the collapse of private and public. *Leonardo Electronic Almanac*, 16(2–3), 1–10. Retrieved from: <http://jilltxt.net/txt/Blogs--Literacy%20and-the-Collapse-of-Private-and-Public.pdf>.
- Rettberg, J. W. (2014). Seeing ourselves through technology: How we use selfies, blogs and wearable devices to see and shape ourselves. *Palgrave Macmillan*. doi:10.1057/9781137476661.
- Senft, T. M. (2013). Micro-celebrity and the branded self. In J. Hartley, J. Burgess, & B. Bruns (Eds.), *A companion to new media dynamics* (pp. 346–354). Hoboken, NJ: Wiley-Blackwell.
- Senft, T. M., & Baym, N. (2015). What does the selfie say? Investigating a global phenomenon. *International Journal of Communication*, 9, 1588–1606. Retrieved from: <http://ijoc.org/index.php/ijoc/article/view/4067/1387>.
- The Flashpack. (2014, July 20). Rise of the Status-cation. Retrieved from: [http://www.sourcewire.com/newsroom/TheFlashPack/release/83770/rise-of-the-status-cation#.Vi4QkCsiN\\_B](http://www.sourcewire.com/newsroom/TheFlashPack/release/83770/rise-of-the-status-cation#.Vi4QkCsiN_B)
- Trip Advisor. (2013, Oct. 22). TripBarometer mobile and social survey finds 85% of US travellers bring their Smartphones on vacation & 61% report using social media while travelling. Retrieved: <http://tinyurl.com/o8ezk8l>
- Urry, J. (1990). *The tourist gaze: Travel and leisure in contemporary societies*. London: Sage.
- Urry, J., & Larsen, J. (2011). *The tourist gaze 3.0*. London: Sage.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387. doi:10.1177/0047287511426341.
- White, P. & White, N. (2005). Virtually there: Travelling with new media. *First Monday*, 10(8). Retrieved from: <http://www.firstmonday.org/article/view/1267/1187>
- Wotif. (2014, Aug. 26). Holiday selfies take-off. Retrieved: <http://www.wotif.com/vc/media/node/251>
- Yoo, K., & Gretzel, U. (2011). Influence of personality on travel-related consumer-generated media creation. *Computers in Human Behaviour*, 27(2), 609–621. doi:10.1016/j.chb.2010.05.002.
- Youngs, T. (2013). *The Cambridge introduction to travel writing*. London: Cambridge University Press. <http://dx.doi.org/dbgw.lis.curtin.edu.au/10.1017/CBO9780511843150>.

# Exploring Park Visitors' Activities in Hong Kong using Geotagged Photos

Huy Quan Vu, Rosanna Leung, Jia Rong, and Yuan Miao

**Abstract** Understanding tourist activities could help attraction managers for appropriate planning and decision making. For a metropolitan city with limited land as Hong Kong, insight into what tourists have done in the urban area is vitally important. Tourists' travel photos, tagged with geographical information, can assist attraction managers in identifying tourism hot spots and the activities that the visitors are interested in at certain spots. This study examined major visitor's activities in the urban parks in Hong Kong by utilizing the geotagged photos posted on the social media sites. The results indicated that visitors had different interests in different parks. Moreover, the focuses of park visitors are different between local residents and international tourists. By spotting the photo locations, attraction managers can identify the tourists' concentration so as to arrange better management on crowd control and visitors' safety.

**Keywords** Tourist activities • Geotagged photos • Urban parks • Hong Kong • Attractions management

## 1 Introduction

Photos are visual ways to represent tourists' travel experience (Albers & James, 1988) and "photographs are a common way to communicate personal trip experiences and perceived destination images" (Schmallegger, Carson, & Jacobsen, 2009, p. 245). With the wide spread to travel photos on online community and media-sharing websites such as Facebook and Flickr, tourists could able to obtain various visual information about the destinations or the attractions before they travel. Destination photography images can shape or reshape potential travelers'

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destination perceptions and, consequently, influence their decision-making processes (Mutinda & Mayaka, 2012). Research on the relationship between destination perceptions and visitors' cultural backgrounds has been identified as an important direction for destination image studies, which aims to help *destination marketing organizations* (DMOs) for a more effective position and to promote tourism offers in culturally different target markets (Kastenholz, 2010). However, tourists always scattered around various destinations base on their specific travel interests. It is difficult to survey every tourist to collect and identify the individual activities attracted him or her most at all tourism spots. Although a big number of surveys were conducted every year, only few attraction managers from big scale tourism spots can obtain the resulting statistics; no detailed report of small scale tourism spots was available to the public. For example, the *Hong Kong Tourism Board* (HKTB) claimed that *Hong Kong Park* was one of the popular tourists' attractions with around 11 % long-haul and 4 % of overall tourists visited in 2014 (HKTB, 2014). The HKTB report only shows the tourist profile distribution, without any information about the tourism activities in the park. *Hong Kong Park* was the only park reported in the survey, however there are two more city parks, *Kowloon Park* and *Victoria Park*, were listed on HKTB website (<http://www.discoverhongkong.com/ca/see-do/great-outdoors/city-parks/index.jsp>). With limited description provided, the tourists visiting and activity information are still remained unclear. In order to fill this gap, a project *aimed to uncover the visitors' distribution and the attractive activities in popular tourism spots in Hong Kong* was conducted.

Recently the availability of socially generated and user-contributed geotagged photos on the Internet has presented a new way to capture and analyze tourists' behaviors at the destinations (Vu, Li, Law, & Yip, 2015). Those geotagged photos were taken along the tourists' travelling path using digital photos capturing devices such as smartphones and tablets. Such digital devices are equipped with a built-in *global positioning system* (GPS) to automatically record geographical information. When the tourists posted their travel photos to online social media sites, the geographical information were uploaded together as the Metadata that can be retrieved later. The scholars and the managers will be able to infer tourists' movement trajectories by tracking the locations where they took the photos (Vu et al., 2015). However, the geotagged photos have unpredictable value, which have been explored much yet. This paper attempted to explore the visitors' activities in popular parks in Hong Kong using geotagged photos and the Metadata attached. The outcomes were expected to provide valuable information to the attraction managers of the small scale tourism spots in Hong Kong for business planning, marketing strategies, and attraction management.

Having thus set the context for undertaking this work, the rest of the paper is organized as follows: Sect. 2 reviews existing works in studying tourist activities; Sect. 3 presents the methods for extracting and processing geotagged data; a case study of analyzing the activities in popular parks in Hong Kong and the corresponding findings are reported in Sect. 4; Sect. 5 concludes the paper with practical implication and future research direction.

## 2 Literature Review

Tourist destination has been intensively researched for years. Most of the works focused on understanding visitors' perception and destination choice (Syed-Ahmad, Musa, Klobas, & Murphy, 2013). Various factors have been reported to have effects on tourists' destination choices, including travel motivation and satisfaction (Yoon & Uysal, 2005), prices and distance (Nicolau & Más, 2006), culture and historical resources, and environmental safety (Hsu, Tsai, & Wu, 2009). Besides, tourist's interest in the activities available at the destinations is another factor that takes an important role in decision-making process (Deutsch-Burgner, Ravualapathy, & Goulias, 2014). Destination marketing performance can be thus enhanced by activities segmentation (Mumuni & Mansour, 2014). Based on the tourists preferred vacation activities and their preferences, tourists can be grouped into different segments so that destination marketers could have a better focus when they conduct marketing campaigns.

As part of the daily tasks, attraction managers need to manage and elevate profitability as well as deal with various technical issues including crowd control, health and safety, and consumer satisfaction (Tribe, 2008). With the wide spread of user generated content on the Internet, scholars and managers can easily obtain a large amount of data that contain the visitors' profiles, textual and visual information about tourists' past travel experience from various social media sites. Textual comments have become a major source of customer behavioral and satisfactory studies in the past decade (Schuckert, Liu, & Law, 2015). On the other hand, more and more researchers put their eyes on the photo images taken and posted by tourists to share experience and express opinions on their past travels (Ding, Liu, & Zhang, 2009; Ye, Zhang, & Law, 2009). Recently, geotagged photos attracted much attention on analyzing tourists' travel pattern (Hsu et al., 2009), suggesting travel routes (Kurashima, Iwata, Irie, & Fujimura, 2012), providing personalized travel recommendations from demographics of individuals, and grouping travelers of and their travel paths (Chen, Cheng, & Hsu, 2013). Despite the effort was made, majority of existing studies focused on tourists' travel pattern or routes but not focused on what they have done at the tourism spots.

Furthermore, many spots such as parks were not designed just for international tourists, but also for local residents. These two groups of visitors may have different motivations of their visits and other expectations on the activities available. In order to satisfy all potential visitors, attraction managers need to have a good understanding of the behaviors and preference of both local residents and international travelers. However, this is still an open topic waiting for researchers and managers to explore further. Aiming to bridge the gap in understanding the activities of park visitors, this study utilized the geotagged photos to identify the most popular parks in Hong Kong and revealed tourists activities at those parks. The differences in the interested activities between international and local visitors were marked as well. The next section presents the details of the methodology used in this work.

### 3 Methodology

The geotagged photo data were firstly extracted from Flickr using its Application Programming Interface (API, [www.flickr.com/services/api](http://www.flickr.com/services/api)). The region can be specified by a bounding box with four coordinates  $x_{min}$ ,  $y_{min}$ ,  $x_{max}$  and  $y_{max}$  that indicate minimum longitude, minimum latitude, maximum longitude, and maximum latitude, respectively. A keyword was used to narrow down the search space to return only the relevant geotagged photos. For example, the keyword “*park*” was used in data collection to obtain all the photos taken in the parks. Then a clustering technique, named P-DBSCAN (Kisilevich, Mansmann, & Keim, 2010) was adopted to identify the most popular parks based on both the number of the visitors and the posted photos.

Two steps were involved in the proposed analysis model: (1) geotagged photo clustering, and (2) textual Metadata processing. With the purpose of obtaining objective result, a clustering technique was adopted to automatically identify the popular parks that had attracted most visitors and the number of the photos they took and posted on the social media sites. The Metadata attached to the uploaded photos contains textual information, such as user profiles, photo titles, user-defined photo tags, and content descriptions, which often reflects the motivation of the photo taking. Such textual data need to be processed before the analysis can be carried out. Text-processing technique applied on the Metadata can help to discover the park visitors’ interests and infer the activities they would like to participate.

#### 3.1 Geotagged Photo Clustering

Suppose  $D$  is a collection of geotagged photos, a photo  $p$  is referenced by a value pairs  $\langle x_p, y_p \rangle$  for longitude and latitude respectively. Distance between two photos  $p$  and  $q$  is defined as  $Dis(p, q)$ . The neighborhood photo  $N_\theta(p)$  of a photo  $p$  is defined by:

$$N_\theta(p) = \{q \in D, Owner(q) \neq Owner(p) \mid Dist(p, q) \leq \theta\} \quad (1)$$

where  $\theta$  is a neighborhood radius,  $Owner(q)$  is an ownership function to specify the owner of photo  $q$ . If photo  $q$  is not owned by the same user as photo  $p$  and its location is within the neighborhood radius  $\theta$ , photo  $q$  is called the neighbor of photo  $p$ . Let  $NeighborOwner(p)$  be the owner number of the neighbor photos  $N_\theta(p)$ , and  $\delta$  be the threshold, photo  $p$  can be called as a *core photo* if  $NeighborOwner(p) \geq \delta$ . The values  $\theta$  and  $\delta$  are pre-determined based on the scales of the specific applications. If the region to be identified is at the macro level, large values can be assigned to  $\theta$  and  $\delta$ , otherwise, smaller values can be used instead. By considering the ownership, the clustering process can account for the actual number of visitors



rather than only by the photos. Thus, the identified clusters indicate locations with many visitors.

At the beginning of the clustering process, all photos are marked as unprocessed. For each photo  $p_i$ , if it is not a core photo, then it is marked as irrelevant and is discarded. Otherwise, it is assigned to a cluster  $c$ , and all of its neighbors are put into a queue to be processed next. Each of the neighboring photos is processed and assigned to the current cluster  $c$  until the queue is empty. The process iterates for the rest of the unprocessed photo in the data set, and results a set of clusters  $C$ . The geographical coordinates are then translated to present the name and the spatial extent of the area.

### 3.2 Textual Meta-Data Processing

The textual information stored in the Metadata can help to identify the tourists' interests and the activities they participated. If a tourist took photos of certain things or objects that they were interested in or want to record in memory, they would often put specific keywords as photo tags or left short notes in photo descriptions. Such textual data are normally unstructured, which are not easy to be analyzed directly. To solve this problem, a powerful text processing tool called *General Architect for Text Engineering* (GATE) (<http://gate.ac.uk/>) was employed. GATE supports English lexicon to provide a comprehensive list of vocabulary terms to describe the interests.

Suppose a photo data set  $P$ , in which each photo  $p_i$  contains the Metadata of its title, tags, and description and denoted as  $t_i$ . The Metadata  $t_i$  of each photo  $p_i$  is a string of text, which is firstly loaded into a text tokenizing algorithm. The textual stream is broken into words, phrases, symbols, or other meaningful elements called "tokens". The tokens are then passed through a filter to normalize all letters to lower case, where symbols or numbers are removed. The remaining tokens were input into a stemming process to reduce inflected words to their stem, base, or root form. For instance, the words "trees" and "flowers" reduced to "tree" and "flower". The stemmed token list for each photo is denoted as  $S^{(i)} = \{s_1^{(i)}, s_2^{(i)}, \dots\}$ . It is assumed that the English vocabulary of noun types is used to refer to entities, such as tourist interests (e.g., *tree*, *flower*). Therefore, a list of stemmed nouns appeared in the data set is constructed as  $N = \{n_1, n_2, \dots, n_m\}$ . The word types, such as *noun*, *verb*, or *adjective* are determined based on a set of tags for each word in the English lexicon of Gate.

Once the word list is ready, we move to identify a set of the interesting nouns from the list for further analysis as potential visitor interest. Specifically, a binary vector  $\{v^{(i)} = v_1^{(i)}, v_2^{(i)}, \dots, v_m^{(i)}\}$  was constructed for each visitor, where  $v_j^{(i)}$  takes the value of 1 if  $n_j$  appear at least once in the textual Metadata of the photo

collection belonging to user  $u_i$ ; or 0 otherwise. The degree of interest of each noun,  $n_j \in N$ , is evaluated by a support value:

$$\text{supp}(n_j) = \frac{\text{count}(n_j)}{|U|} \quad (2)$$

where  $\text{count}(n_j)$  is the count of vector  $v^{(i)}$ , whose value  $v_j^{(i)} = 1$ , and  $|U|$  is the total number of visitors in the collected data set. A user predefined support threshold  $\beta$  is used to measure the significance of the nouns. If a noun  $n_j$  satisfies  $\text{supp}(n_j) \geq \beta$ , then  $n_j$  is selected into the visitor interest candidate list; otherwise it is discarded. By this way, we do not need to provide a set of predefined keywords; instead a list of candidates is automatically constructed from the textual Metadata. The support threshold  $\beta$  is set to eliminate infrequent nouns, while retaining potentially interesting one for subsequent analysis. Once the visitor interests are identified, we can exam the actual photos taken for each individual interest to have insight into tourists' own travel experience.

## 4 Experiment Design and Result Analysis

Following the methodology presented in the previous section, we implemented the proposed model using a geotagged photo data set collected from Flickr to explore the park visitors' interests and the activities they participated in Hong Kong area.

### 4.1 Popular Park Identification and Data Extraction

In order to identify the popular parks, we extract all photos with the tag “park” over geographical area of Hong Kong. A bounding box was defined with the parameters ( $x_{min} = 113.887603$ ;  $y_{min} = 22.215377$ ;  $x_{max} = 114.360015$ ;  $y_{max} = 22.51446$ ) to cover the entire area shown in Fig. 1. The combination of bounding box parameters and “park” tag help to narrow the search to photos relevant to park and taken in Hong Kong area. The photos were collected in a time period of recent five and half years, from 1st January 2010 to 30th June 2015. The extraction process result 6457 photos collected from 792 users.

The P-DBSCAN clustering technique was applied to the collected data set for the popular parks with most visitors and photos taken. The neighborhood radius value was set as  $\theta = 0.002$ , which is equivalent to approximately 150 m. This small sale is suitable for identifying the location of interest at a micro level such as parks. The minimum owner number  $\delta$  was set as 10 % of the total number of users. The returned clusters were automatically determined based on the density of the photo points and visitor numbers without any manual control. Figure 2 shows the



Fig. 1 Locations of park photos

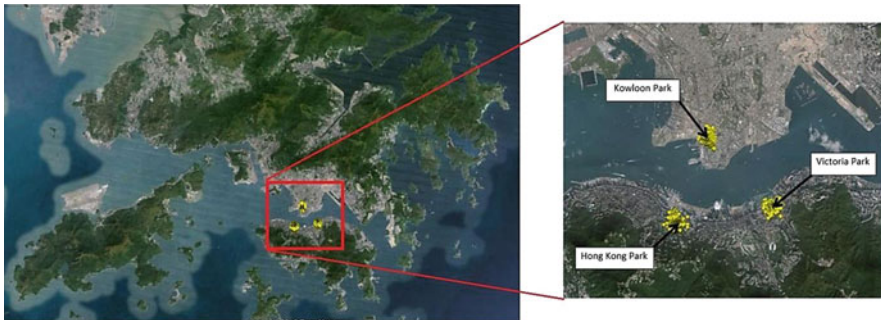


Fig. 2 Popular parks identified in clustering process

result with a zoom in closer to three individual clusters: *Kowloon Park*, *Hong Kong Park* and *Victoria Park*. Such result confirmed the popular parks announced on the HKTB website.

By considering the factor that some photos taken inside the park may not be tagged with the “*park*” tag, we performed a second round of data collection to focus on the photos that were taken inside these three parks. Since, the geographical areas of the parks are not always rectangular, therefore multiple bounding boxes were defined complementary to each other to cover the areas as much as possible. As a result, we obtained much more geotagged photos that were taken inside the parks rather than only considering to have those with keyword “*park*” in Metadata. A statistic summary of the collected new data set is presented in Table 1. Different from the existing understanding, *Victoria Park* attracted more visitors than other two parks in the past 5 years.

**Table 1** Park visitors data sets

Location	Visitors	Photos	Photo numbers per visitor
Victoria Park	462	9094	19.68
Hong Kong Park	382	3082	8.07
Kowloon Park	382	1975	5.17

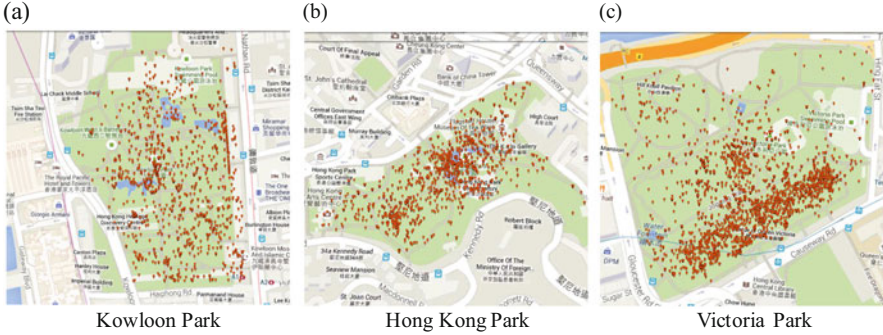
**Fig. 3** Location of photos taken inside the parks (a) Kowloon Park, (b) Hong Kong Park, (c) Victoria Park

Figure 3 shows the exact location of each photo in the parks, denoted as a dot on the map. Visitors in *Kowloon Park* tended to spread over the entire park area; *Hong Kong Park* attracted more visitors to take photos near the central lake; while in *Victoria Park*, visitors preferred more to stay in the southern area.

## 4.2 Visitor Interest Analysis

To identify the popular interests of visitors in the parks, we adopted the text processing technique on the textual Metadata attached to the collected photo data set. To obtain an objective result, we did not use a predefined value for the support threshold  $\beta$ , but examined a range of values (from 0 to 0.1) on the collected data set to pick an appropriate one that suited this park case study the best. In Fig. 4, the numbers of interest candidates drop dramatically as the  $\beta$  increase from 0 to 0.02, and then decreased gradually. When  $\beta = 0$ , the algorithm returns all the nouns in the stemmed noun list for each park; when  $\beta = 0.1$ , no interest candidate is returned for any park.

In this study, we aimed to explore only the most popular interests of visitors, therefore a support threshold  $\beta$  was set to 0.05, which returned a reasonable number of the candidates: 15 for *Kowloon Park*, 14 for *Hong Kong Park*, and 11 for *Victoria Park* respectively. With this relatively small number of interest candidates, it is possible for the attraction managers to explore further with the corresponding photos for more information. We inspected the candidate lists to identify the top

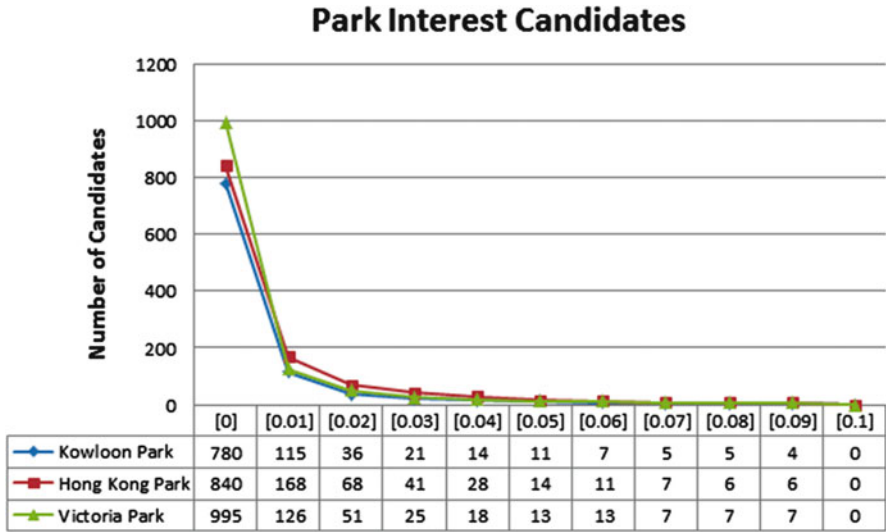


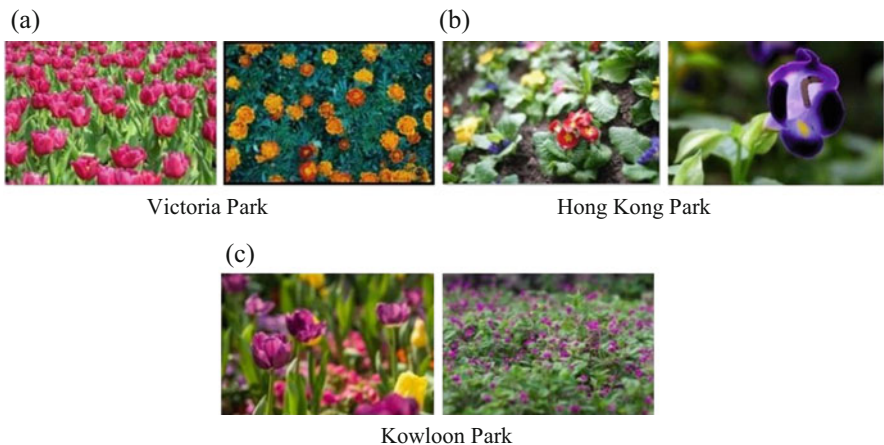
Fig. 4 Candidates of visitors’ interests against various support threshold values

interests that the visitors recorded by their photos. Table 2 lists the top four candidates and their corresponding support values for each park. The higher the support value is the more visitors have participated in with photos. Both “birds” and “flowers” appeared frequently in all three lists, but the *Kowloon Park* is highlighted by the interest of “bird”; while “flamingo” is the name of a special spice of birds. This proved Pan, Lee and Tsai’s conclusion (2014) that natural resources were the key elements in tourism development and were mainly associated with pleasant feelings visitors developed for a destination. On the other hand, “tower” and “skyscraper” photos were taken quite often in *Hong Kong Park*, while, more photos of “people” and “festival” were taken in *Victoria Park*.

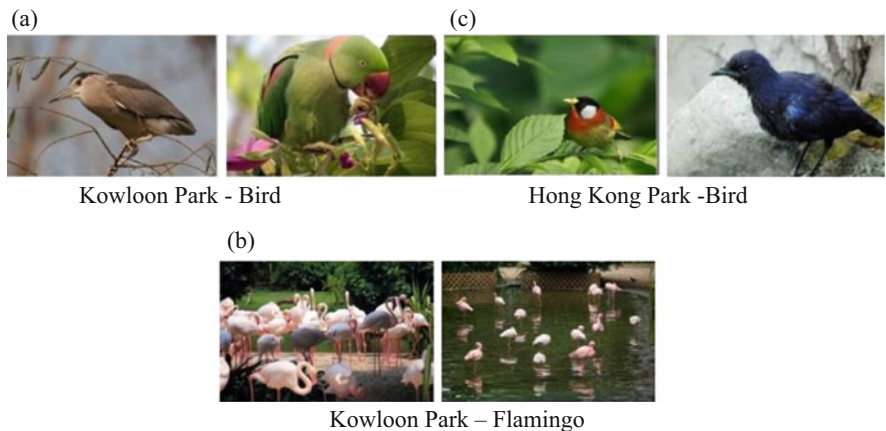
Moreover, with the top interest list, we could check the actual photo content to see how visitors perceive the image of a destination. Thus, visual inspection of the photos was carried out for the photos belong to each of the interests. As the result, we found a common pattern that most of the “flower” photos were taken within a close distance to focus on the details in all three parks (see Fig. 5). Similar cases were captured for “birds” in *Kowloon Park* and *Hong Kong Park* (see Fig. 6). The visitors also recorded the special behaviors for flamingos that always stayed and flew in groups; while the other spices of birds can be captured alone. In *Hong Kong Park*, the “tower” and “skyscraper” photos were normally taken in daytime; however, the “people” and “festival” photos in *Victoria Park* contained more evening events (Fig. 7b). Interestingly, the “tree” tagged photos taken in *Kowloon Park* normally focused on other objects (for example, buildings as shown in Fig. 8) rather than trees. Due to privacy issue, no photo with any content that can be used to identify individual visitor is shown in this paper.

**Table 2** Identified interests of park visitors

Victoria Park		Hong Kong Park		Kowloon Park	
Interest	Support	Interest	Support	Interest	Support
Flower	0.186	Bird	0.139	Tree	0.063
Show	0.117	Tower	0.068	Flower	0.060
People	0.069	Flower	0.068	Bird	0.055
Festival	0.061	Skyscraper	0.050	Flamingo	0.052



**Fig. 5** Flower photos (a) Victoria Park, (b) Hong Kong Park, (c) Kowloon Park



**Fig. 6** Bird and flamingo photos (a) Kowloon Park—Bird, (b) Kowloon Park—Flamingo, (c) Hong Kong Park—Bird





Fig. 7 Photos with similar scenes (a) Hong Kong Park—tower and skyscraper, (b) Victoria Park—people and festival



Fig. 8 Photos having the “tree” tag in Kowloon Park

### 4.3 Contrast Analysis of Local and International Visitors

As parks in Hong Kong are opened to welcome all visitors, not only for international tourists but also the local residents, we applied a contrast analysis to explore the different interests they may have respectively. To identify the group of visitors, we queried Flickr for the location of origin for all the users in our data set (Table 2). Since the location of origin is not a mandatory criterion for Flickr registration, many users have not yet provided such information. Therefore, this study only kept the data instances with user location information available. Except the Hong Kong local residents, all the visitors from other countries were put into the international group. Table 3 shows the statistics of local and international visitors for all three parks. Notably, the exclusion of visitors without location information left us with less data than in the previous analysis. However, it should still be sufficient for our aim of contrasting the difference between the groups. As the photos with tags of “tower” and “skyscraper” shared similar objects, we merged them into one single interest item as “building”. We also merged the photos of “people” with those tagged as “festival” for the same reason. The “Tree” photos at Kowloon Park actually had random objects, thus we excluded them from this analysis.

**Table 3** Local and international visitor data sets statistics

Location	Local		International	
	No. of visitors	No. of photos	No. of visitors	No. of photos
Victoria Park	135	3603	78	1023
Kowloon Park	60	529	110	545
Hong Kong Park	57	859	103	559

**Table 4** Chi-square test on park interests between local and international visitors

Location	Interest	Local visitor (%)	International visitor (%)	Difference	$\chi^2$	<i>p</i> -Value
Victoria Park	Flower	29.63	15.38	14.25	5.4363	0.020*
	Festival	14.07	16.67	-2.60	0.2603	0.610
Kowloon Park	Flower	18.33	4.55	13.78	8.6566	0.003*
	Bird	3.33	5.45	7.88	3.1890	0.074
	Flamingo	5.00	7.27	-2.27	0.3314	0.565
Hong Kong Park	Flower	15.79	4.85	10.94	5.4954	0.020*
	Bird	24.56	19.42	5.14	0.5802	0.446
	Building	1.75	20.39	-18.64	10.7434	0.001*

\*Significance at  $p < 0.05$

Proportional analysis was performed on both *local* and *interactional* visitor groups as shown in Table 4. A chi-squared statistical test with significant level of less than 0.05 was applied to verify the difference. The *local* visitors appeared to be more interested in “flower” than the *international* visitors in all three parks, as shown with the differences of more than 10 percentage point and *p*-value less than 0.05. In contrast, the *international* visitors were more interested in tall “building” than the *local* visitors in *Hong Kong Park* (over 18 percentage point difference). Although, there were some differences between the two groups on “bird”, “flamingo” and “festival”, but not statistically significant so far.

## 5 Discussion and Conclusion

This study attempted to examine the visitors’ activities and interests at Hong Kong’s park using geotagged photos. By plotting the locations of photo taken, attraction managers are able to identify the most popular spots where visitors gathered so as to maintain a better crowd control. The southern part of *Victoria Park* and the central part of *Hong Kong Park* attracted many visitors taking photos; while the visitors scattered around *Kowloon Park* without any specific spots. Besides, this study also identified the popular tourists’ interests. In the *Victoria Park*, majority visitors enjoy the festival events there; In the *Hong Kong Park*, the visitors preferred to take photos of the entire skyscrapers located in city central and



also watch birds inside the park; in the *Kowloon Park*, the visitors took a large number of photos of the flamingo birds and other natural creations. All these findings can help attraction managers to design new marketing strategies to attract tourists according to the top interests and activities in that area. They can study the different interests between the local residents and the international tourists as well. Future work will focus on analyzing the content of the photos taken in further details. For example, from all the “*festival*” photos, we will try to identify the particular events or activities that will attract more visitors than the others. Contrast analysis of visitor behavior can also be performed according to time such as days, season, and special events.

## References

- Albers, P. C., & James, W. R. (1988). Travel photography: A methodological approach. *Annals of Tourism Research*, 15(1), 134–158.
- Chen, Y.-Y., Cheng, A.-J., & Hsu, W. H. (2013). Travel recommendation by mining people attributes and travel group types from community-contributed photos. *IEEE Transactions on Multimedia*, 15(6), 1283–1295.
- Deutsch-Burgner, K., Ravualaparthi, S., & Goulias, K. (2014). Place happiness: Its constituents and the influence of emotions and subjective importance on activity type and destination choice. *Transportation*, 41(6), 1323–1340.
- Ding, X., Liu, B., & Zhang, L. (2009). Entity discovery and assignment for opinion mining applications. In *Proceedings of the 15th ACM SIG KDD Conference on Knowledge Discovery and Data Mining* (pp. 1125–1134), Paris, France.
- HKTb. (2014). Visitor profile report 2014. Retrieved August 21, 2015, from [http://securepartnernet.hktb.com/filemanager/intranet/dept\\_info/private\\_20/paper/Visitor-Pro/Profile2014/Visitor\\_Profile\\_2014\\_0.pdf](http://securepartnernet.hktb.com/filemanager/intranet/dept_info/private_20/paper/Visitor-Pro/Profile2014/Visitor_Profile_2014_0.pdf)
- Hsu, T.-K., Tsai, Y.-F., & Wu, H.-H. (2009). The preference analysis for tourist choice of destination: A case study of Taiwan. *Tourism Management*, 30(2), 288–297.
- Kastenholz, E. (2010). “Cultural proximity” as a determinant of destination image. *Journal of Vacation Marketing*, 16(4), 313–322.
- Kisilevich, S., Mansmann, F. & Keim, D. (2010). P-DBSCAN: A density based clustering algorithm for exploration and analysis of attractive areas using collections of geo-tagged photos. In *Proceedings of the 1st International Conference and Exhibition on Computing for Geospatial Research & Application Article*. Article no. 38, Bethesda, MD.
- Kurashima, T., Iwata, T., Irie, G., & Fujimura, K. (2012). Travel route recommendation using geotagged photos. *Knowledge and Information Systems*, 37(1), 37–60.
- Mumuni, A. G., & Mansour, M. (2014). Activity-based segmentation of the outbound leisure tourism market of Saudi Arabia. *Journal of Vacation Marketing*, 20(3), 239–252.
- Mutinda, R., & Mayaka, M. (2012). Application of destination choice model: Factors influencing domestic tourists destination choice among residents of Nairobi, Kenya. *Tourism Management*, 33(6), 1593–1597.
- Nicolau, J. L., & Más, F. J. (2006). The influence of distance and prices on choice of tourist destinations: The moderating role of motivations. *Tourism Management*, 27(5), 982–996.
- Pan, S., Lee, J., & Tsai, H. (2014). Travel photos: Motivations, image dimensions, and affective qualities of places. *Tourism Management*, 40, 59–69.
- Schmallegger, D., Carson, D., & Jacobsen, D. (2009). The use of photographs on consumer generated content websites: Practical Implications for destination image analysis.

- In S. Nalin (Ed.), *Tourism informatics: Visual travel recommender systems, social communities, and user interface design* (pp. 243–260). Hershey, PA: Hershey.
- Schuckert, M., Liu, X., & Law, R. (2015). Hospitality and tourism online reviews: Recent trends and future directions. *Journal of Travel and Tourism Marketing*, 32(5), 608–621.
- Syed-Ahmad, S. F., Musa, G., Klobas, J. E., & Murphy, J. (2013). Audience response to travel photos and Arab destination image. *Journal of Travel and Tourism Marketing*, 30(1-2), 161–164.
- Tribe, J. (2008). Tourism: A critical business. *Journal of Travel Research*, 46(3), 245–255.
- Vu, H. Q., Li, G., Law, R., & Yip, B. H. (2015). Exploring the travel behaviors of inbound tourists to Hong Kong using Geotagged photos. *Tourism Management*, 46, 222–232.
- Ye, Q., Zhang, Z., & Law, R. (2009) Sentiment classification of online reviews to travel destinations by supervised machine learning approaches. *Expert Systems with Applications*, 36 (3 Part 2), 6527–6535.
- Yoon, Y., & Uysal, M. (2005). An examination of the effects of motivation and satisfaction on destination loyalty: A structural model. *Tourism Management*, 26(1), 45–56.

# Tourists Visit and Photo Sharing Behavior Analysis: A Case Study of Hong Kong Temples

Rosanna Leung, Huy Quan Vu, Jia Rong, and Yuan Miao

**Abstract** Travel statistics report published by the tourism board was one of the important sources that attraction managers used to plan for marketing strategies. However, only a limited number of famous attractions were involved in such reports, therefore rare information was gathered for 2nd or 3rd tier attractions, such as temples. These small attractions were kept away from many tourists' knowledge or travel plan so that it is also a difficulty to explore their visit behaviors. Fortunately, social media sites have been rapidly developed and widely used in our lives, to fill this blank with a large number of active users, who shared their travel experiences by writing textual comments and uploading travel photos. This provides scholars and managers with opportunities to understand tourists' behaviors and the potential attractions they are interested in, by analyzing the photos they uploaded and shared online. In this paper, we report a study of extracting geotagged photos uploaded by tourists to one of the popular social media sites, Flickr, for tourists' visit and sharing behavior analysis of Hong Kong temples. The results indicate four popular temples that attracted most tourists taking photos. The behavior analysis shows the difference preferences of tourists from various locations and the trend changes of their visits in the past 5 years.

**Keywords** Geotagging • Photos • Flickr • Tourists' behaviour • Temples • Hong Kong

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## 1 Introduction

Being the most popular city destination around the world in 2013 (Euromonitor International, 2015), Hong Kong attracted more than 60 million tourists visiting this tiny place in 2014 (HKTB, 2014a). *Hong Kong Tourism Board* (HKTB) has been promoting Hong Kong as a shopping and dining paradise. Statistics showed that tourists spend more than 60 % on shopping, 18 % on accommodations, and 12 % on dining (HKTB, 2014b). However, what other activities they involved in trips stay unclear to industry practitioners. Statistics in official reports only focused on popular attractions and major tourist's activities; anything beyond that was still undercover due to time and budget constraints for conducting comprehensive survey to gather information from every tourist. Moreover, tourists from different regions and cultures often behave differently (Leung et al., 2012). Therefore, attraction managers cannot easily obtain enough valuable data for analysis but only rely on their own observations on limited number of samples and information passed by others to prepare their marketing and business strategies (Lew & McKercher, 2006). According to HKTB (2014b), visiting temples was one of the popular tourists' activities in Hong Kong. However, no prior research or statistical report indicates which temples were in the top visited list or any details showing visitors' behaviors.

In the Internet era, many tourists posted their travel photos on social media and online photo albums to share their travel experiences with friends and relatives. Their selections of the photos to be uploaded and shared present their personal opinions of the past travels, which directly affect the peers' impressions and decision-making (Tham, Croy, & Mair, 2013). Many existing studies focused on analyzing textual information attached to the uploaded photos, such as hash tags (Zhang & Yun, 2014), photo captions (Pan, Lee, & Tsai, 2014), and review comments (Park & Nicolau, 2015). However, if the photo does not associate to any textual context, it is not easy to use those existing methods and obtain expected outcome.

*GeoTagging* (here after geotag) is a process of attaching geographical identification metadata into multimedia documents such as images and videos (Zheng, Zha, & Chua, 2012). Since digital cameras and small phones having built in GPS functions, when people taking photos with such devices, a large number of photos shared on social media websites contain GPS information as geotags. Together with the time of photo taking and the associated user profiles, geotags stored as the Metadata of photos shared can be used to outline tourists' travel paths and activities they participated during the trips. Even the tourist did not type in any comment for the photos, the users' profile and the photos themselves can provide certain details for behavioral analysis. Attraction managers therefore can analyze such information to get better understanding of tourists' preferences and behavioral differences. This study aims to *analyze tourists' visit behaviors using geotagged photo images shared on social media sites together with the associated Metadata*.

The rest of paper is structured as follows. Section 2 reviews existing literature on analyzing tourist behavior using GPS information. A framework for collecting and processing geotag data from photos is introduced in Section 3. Section 4 presents a case study of analysing tourists' visits and photo sharing behaviours in Hong Kong temples. Section 5 concludes our study and emphasizes on the current limitations.

## 2 Literature Review

After *Geographic Information System* (GIS) was firstly introduced in 2012, it was adopted in many studies to explore tourists' movement patterns (Lau & McKercher, 2006; Zakrisson & Zillinger, 2012). A common way to use GIS required tourists to carry a device to record their travel movement. It can precisely indicate the actual tourists' locations, but with many limitations including: (1) small data samples can be collected due to limited number of devices available; (2) time consuming to record the entire movement; and (3) low participation rate due to the inconvenience caused during the travel. With the popularity of media-sharing platforms (e.g. Flickr and Youtube), massive amount of photos and videos are publicly available on the Internet and have become an important data source for both academic and industry studies. Syed-Ahmad, Musa, Klobas, and Murphy (2013) used photos uploaded by normal users on Flickr to examine the geographic characteristics of Arab Countries. Pan et al. (2014) extracted the captions of tourists' photos to evaluate travel destinations' quality. They collected the relevant photos' descriptions and tourists' comments for a pre-determined destination to identify the relationships among travel motivations, resolutions of images taken at that destination, and other affective qualities.

With the introduction and popularity of *Global Positioning System* (GPS) in smart phones and mobile photo capturing devices, the geographical information are now automatically stored in a photo's geotag for location recording. In order to make use of those geotagged photos available on Internet, many automatic computing algorithms were developed to collect, store and organize those photos for further analysis (Crandall, Backstrom, Huttenlocher, & Kleinberg, 2009; Jaffe, Naaman, Tassa, & Davis, 2006). The collected geotagged photos could help attraction managers to understand users' visit behaviors and discover their travel patterns for future marketing planning. Zheng et al. (2012) extracted photos in four modern cities (*London, Paris, San Francisco, and New York City*) and examined 446 tourists' travel patterns. Vu, Li, Law, and Ye (2015) attempted to use geotagged data to analyze the tourists' travel preferences in Hong Kong. Their study identified the most popular attraction sites in Hong Kong, and the differences in travel patterns between Asian and Western tourists. However, from the recent studies, none of them focused on any 2nd or 3rd tier tourist attraction, but only the officially reported or tourist-known ones. It is unclear to industry practitioners what other tourists' activities or potential attractions are. This study determined *to fill the gaps*

by exploring the tourists' behaviors at the 3rd tier tourist attractions such as temple.

### 3 Methodology

Geotagged photos were made available on the web applications of Flickr for public view, but they were not directly downloadable. They must be accessed via Flickr's Application Programming Interface (API) (Flickr, 2015). In order to identify popular temples based on the number of tourists visited the temples and the photos taken, we proposed a framework to extract geotagged photos from Flickr and cluster both the tourists and the photos for popular temples.

#### 3.1 Geotagged Photo Extraction Using Flickr's API

Among the wide ranges of functions provided by Flickr's API, *PhotosSearch* function allows users to query Flickr's servers and retrieve information based on certain search criteria. The location of each geotagged photo  $p$  is referenced by a value pair  $\langle x_p, y_p \rangle$  for longitude and latitude coordinates. The region defined to extract geotagged photos can be specified by a bounding box, whose coordinates are defined by  $x_{min}$ ,  $y_{min}$ ,  $x_{max}$  and  $y_{max}$  for the minimum longitude, minimum latitude, maximum longitude, and maximum latitude, respectively. The *PhotosSearch* function allows for temporal information to be specified, such as the earliest time ( $t_{min}$ ) and the latest time ( $t_{max}$ ) of photo taking. Only photos taken between these periods are considered. The returned result contains all Metadata information carried by the photos including *PhotoID*, *GPS location*, *TakenDate*, *UploadDate*, *Tags*, *OwnerID* and owner's *demographic information*.

Basically, bounding boxes can be specified over the regions of interested temples to extract the geotagged photo data. However, no prior statistics report officially indicated any temple with potential attractions in Hong Kong. It is also a challenge to define the region for the bounding box of a temple. Some temples may not have clear boundaries with outside areas, while, visitors may take temple photos from either inside or outside of the temple. Therefore, this study adopt a special density clustering, named P-DBSCAN (Kisilevich, Mansmann, & Keim, 2010) to assists the identification of popular temples and specification of the bounding boxes as presented in Sect. 3.2.

### 3.2 Popularity Identification Using P-DBSCAN Clustering

The search process will return a large number of geotagged photos, but not all of them are useful and kept for further analysis. The collected data may be imbalanced that often causes misleading. For instances, one tourist can take many photos at a particular temple; while at another temple, there were many tourists visited but only few photos were taken. When identifying temple popularity, the number of visitors as an important parameter should have more weight than the number of photos taken. This issue can be tackled by using P-DBSCAN, a specifically developed clustering method for geotagged photos. P-DBSCAN takes the photo owner's information and its association to the photos taken into account for computation.

Suppose  $P$  is a collection of geotagged photo data relevant to temple. Photo relevant to temple can be retrieved by specifying keywords (for example, "temple") in the *PhotosSearch* function. Each photo  $p$  is referenced by a value pair  $\langle x_p, y_p \rangle$  for its coordinates. Let  $Dist(p, q) = \sqrt{(x_p - x_q)^2 + (y_p - y_q)^2}$  denotes the direct distance between two photos  $p$  and  $q$ . The neighborhood of a photo  $p$  is defined as  $N_\theta(p)$  using the following equation:

$$N_\theta(p) = (p \in P, Owner(q) \neq Owner(p) | Dist(p, q) \leq r) \quad (1)$$

where  $Owner(\bullet)$  is an ownership function to specify the owner of photo. Equation (1) means that a photo  $q$  is the neighborhood of another photo  $p$  if it belongs to a different user and its location is within a neighborhood radius  $r$  from photo  $p$ . Let  $NeighborOwner(p)$  be the owner number of the neighbor photos  $N(p)$  and  $\delta$  is the owner number threshold. A photo  $p$  is called a core photo if its neighbor photos belong to at least minimum number of owners ( $NeighborOwner(p) \geq \delta$ ).

The P-DBSCAN clustering process starts with a set of unprocessed photos  $p_1, p_2, \dots \in P$ . For each photo  $p_i$ , if it is a core photo, it is assigned to a cluster  $c$ . Otherwise, it is marked as noise and discarded. All neighbors  $N(p_i)$  of the core photo  $p_i$  are put into a queue for further processing. Each neighbor photo  $p_j \in N(p_i)$  was assigned to the current cluster  $c$  until the queue is empty. Such process is repeated for the rest of the unprocessed photo(s) in  $P$ . After all the clusters of photos are obtained, their geographical coordinates are examined to determine the name and the spatial extent of the area. The values  $r$  and  $\delta$  are determined based on the scale of specific applications. If the region to be identified is at the macro level such as a country or a city, large values can be assigned to  $r$  and  $\delta$ . If the region is at a micro level such as a temple,  $r$  and  $\delta$  take small values. The implementation of this technique is discussed further in Sect. 4.

## 4 Experiment Implementation and Finding Analysis

A case study of Hong Kong temples was conducted using the above methods to analyse tourists' visits and photo sharing behaviours. In this section, we presented the process of the adopted experiments and reported the findings from the returned results.

### 4.1 Popular Temple Identification

To identify the popular temples for further analysis, we set the bounding box with parameter values shown in Table 1 to cover the entire Hong Kong geographical area, as suggested in recent work. The search was limited to recent five and half years from January 1 2010 till June 30, 2015. Keywords inputted into the search function were “*temple*” and “*buddha*” due to most of the temples in Hong Kong were built up for Buddhism. If the photo tag field contained one of the provided keywords, then certain photo was included in the returned results; otherwise, it was discarded.

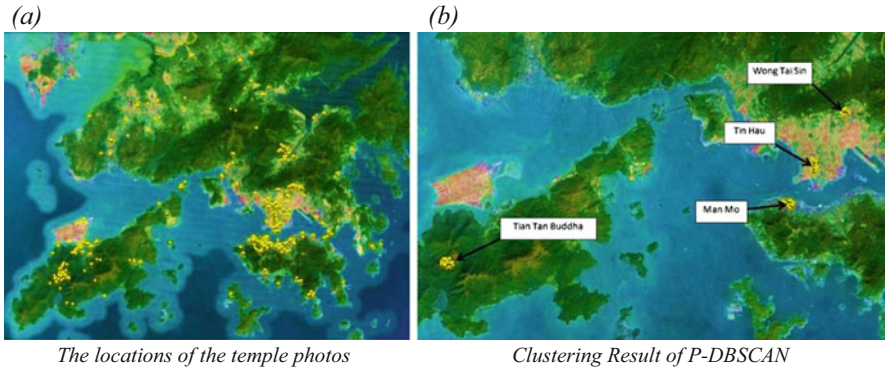
The search returned 3767 photos about temples from 783 visitors over the entire Hong Kong area. The locations of the collected photos are shown as yellow dots on the satellite image as Fig. 1. P-DBSCAN was then applied to the collected dataset for clustering. In our case, the regions of interest were the temples at micro level, thus,  $r$  can take small values of 0.002 as recommended in, which is equivalent to approximately 150 m. The minimum owner  $\delta$  was set to 5 % of the total number owners in data collection. The clustering process returned four clusters as shown in Fig. 1b. After examining the locations, the clusters returned were marked using the names of the corresponding temples. These temples were *Tian Tan Buddha*, *Wong Tai Sin*, *Tin Hau* and *Man Mo*.

From Fig. 2a, b, we found that the photos taken at the *Tian Tan Buddha* and *Wong Tai Sin* clusters were mainly located within or close to the regions belonging to those temples. In this case, we can easily define bounding boxes (as shown in red rectangular), to cover the spatial extends of these temples to extract the data for further analysis. For the cluster shown in Fig. 2d, the photos were centered at *Man Mo* temple, but spread widely to the surrounding areas. The reason is because *Man*

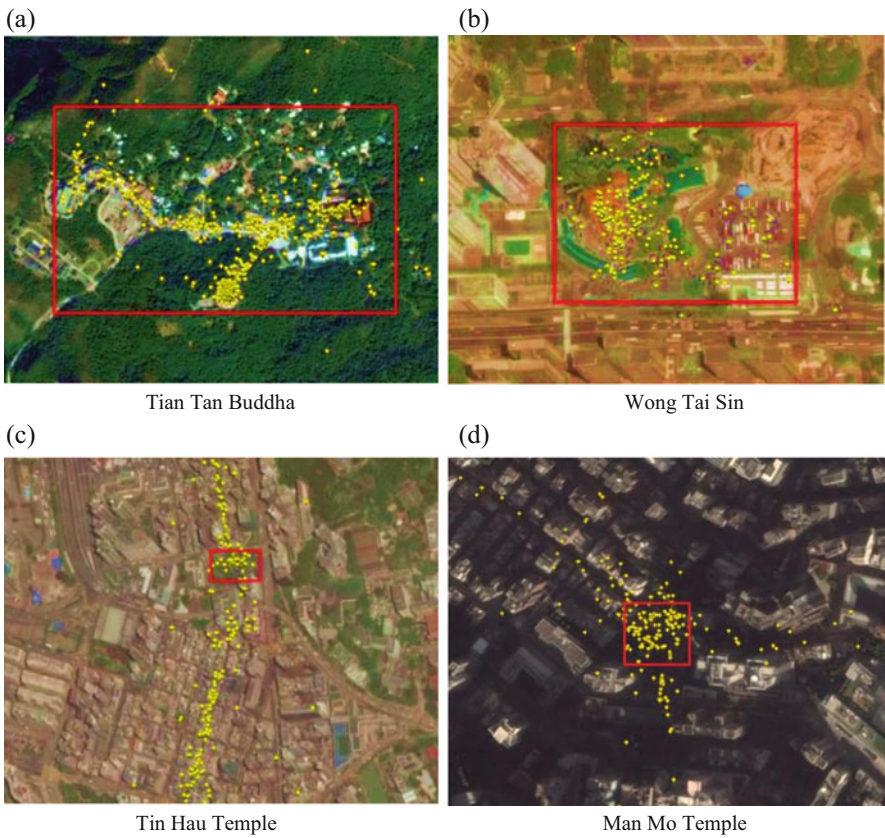
**Table 1** Photo search parameters

Parameter	Value	Description
$x_{min}$	113.887603	Minimum longitude of the bounding box
$y_{min}$	22.215377	Minimum latitude of the bounding box
$x_{max}$	114.360015	Maximum longitude of the bounding box
$y_{max}$	22.51446	Maximum latitude of the bounding box
$t_{min}$	1/1/2010	Earliest photo taken date
$t_{max}$	30/6/2015	Latest photo taken date





**Fig. 1** (a) The locations of the temple photos and (b) clustering result of P-DBSCAN



**Fig. 2** Locations of photos for temple clusters (a) Tian Tan Buddha, (b) Wong Tai Sin, (c) Tin Hau Temple, (d) Man Mo Temple

*Mo* temple stays in the center of *Hong Kong* metropolitan area. Tourists usually take photos of *Man Ho* temple from high levels of the surrounding buildings in this area. In order to exam the behavior of temple visitors, this study set the bounding box to covered the region belonging to *Man Ho* temple only, which was at the center of the cluster. For *Tin Hau* cluster (Fig. 2c), many photos were actually not taken inside *Tin Hau* Temple, but along the “*Temple Street*”. This is due to the specification of “temple” keyword during the photo search process. Many photos at “*Temple Street*” were included but indicated as irrelevant to our interest of temple visitors. However, “*Temple Street*” was named after *Tin Hau* temple. Therefore, *Tin Hau* temple was still included by setting a bounding box only covered the region belonging to the temple.

## 4.2 Geographical Differences on Tourists’ Temple Visit Behaviors

Flickr enable users to fill in their residential country in their profile. In this study, out from the 343 visitors, 47 % of them indicated their country of residence in the profile. As shown in Table 2, around 17 % tourists were from USA and 70 % of them visited *Tian Tan Buddha*. UK ranked second (13 %) and Mainland China tourists ranked third (9 %).

Table 3 indicates the trend in number of users uploading photos to Flickr about Hong Kong temples have been dropped from 2010 to 2014. The data collected for 2015 were discarded because they only covered the period of the first 6 months of the year. There was no solid evidence to proof the reason of the dropping. It could relate to the dropping of Flickr’s popularity, the dropping of visitors’ interest on temples, or the dropping of tourists’ photo sharing behaviour. Moreover, Flickr is not popular in China. Therefore the number of photos upload from China may not reflect the actual tourists’ interests in temples. The results shown one-third of the temple visitors were from Europe, 28 % from Asia, and 20 % from North America (Table 3).

## 4.3 Visit Behavior Analysis for the Identified Popular Temples

In order to avoid the case that some photos taken inside a temple were not tagged with any relevant keyword, so no keyword was used in the data collection process in Sect. 3.1. A second round of data collection was conducted for the identified popular temples with the regions shown in Fig. 2, but no keyword was used. As a result, we obtained a new data set with all the geotagged photos taken inside the selected areas for *Tian Tan Buddha*, *Wong Tai Sin*, *Tin Hau* and *Man Mo* temples.

**Table 2** Geographical distribution of base on Flickr user profile

Country	Tian Tan	Wong Tai Sin	Man Mo	Tin Hau	Total
USA	40	10	5	2	57
United Kingdom	34	4	3	2	43
China	12	7	7	4	30
Australia	18	1	0	1	20
Singapore	14	2	0	2	18
Germany	11	1	3	0	15
Taiwan	10	1	2	1	14
Spain	7	2	1	0	10
Japan	5	1	1	2	9
Russia	7	0	0	1	8
Canada	6	2	0	0	8
Philippines	6	1	0	0	7
Netherlands	4	1	1	1	7
Italy	4	0	1	1	6
Switzerland	5	1	0	0	6
Malaysia	4	0	1	0	5
France	4	0	0	1	5
Brazil	3	1	1	0	5
New Zealand	4	0	1	0	5
Thailand	3	1	0	0	4
Sweden	2	1	1	0	4
Korea	0	1	2	0	3
Belgium	3	0	0	0	3
Argentina	3	0	0	0	3
India	2	0	0	0	2
United Arab Emirates	2	0	0	0	2
Finland	1	1	0	0	2
Mexico	2	0	0	0	2
Bangladesh	1	0	0	0	1
Estonia	1	0	0	0	1
Greece	1	0	0	0	1
Hungary	1	0	0	0	1
Luxembourg	1	0	0	0	1
Norway	0	0	1	0	1
Poland	0	0	1	0	1
Dominican Republic	1	0	0	0	1
Hong Kong Residents	17	7	3	5	32

Totally 6955 photos from 780 visits were returned. Table 4 shows the photos taken at each temple and its corresponding number of visitors.

From the data collected in the first round to identify the popular temples, the numbers of the tourists had a big drop of 40 % from 2013 to 2014 (see Table 3).

**Table 3** Regional distribution of Flickr user profile per year

Region	Year					Total
	2010	2011	2012	2013	2014	
Europe	20	29	23	20	15	107 (33 %)
North America	17	7	13	16	10	63 (20 %)
Australia/New Zealand	5	6	5	6	1	23 (7 %)
South America	0	3	1	4	1	9 (3 %)
Asia	18	21	16	19	14	88 (28 %)
Hong Kong Residents	5	9	3	10	3	30 (9 %)
Total	65	75	61	75	44	320 (100 %)

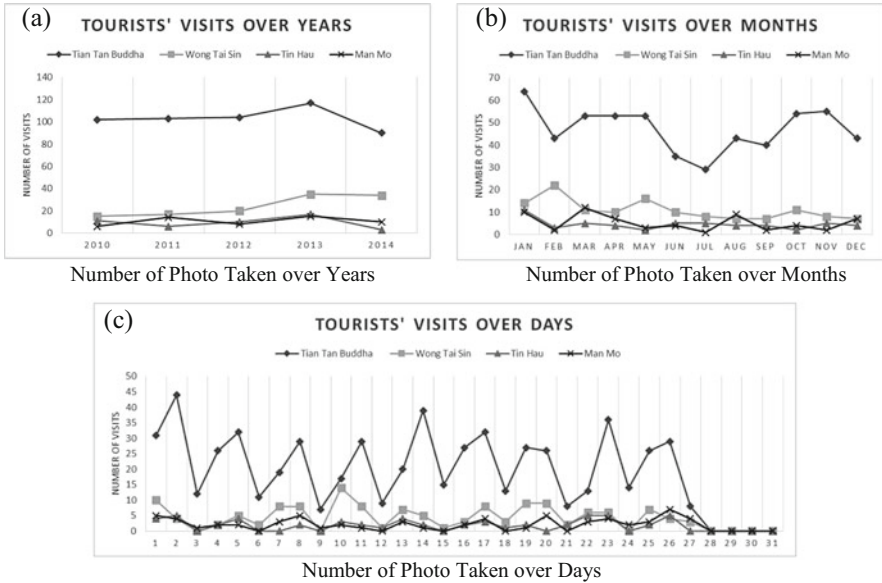
**Table 4** Statistics of tourists and photos uploaded for the popular temples

Popularity	Temple	Photos	No. of visits	Average photos upload Per visitor
1	Tian Tan Buddha	4965	541	9.18
2	Wong Tai Sin	1372	126	10.88
3	Tin Hau Temple	362	60	6.03
4	Man Mo Temple	256	53	4.83
	Total	6955	780	8.92

After we analysed the data collected for the four popular temples, we found the same dropping trend for three of the temples: *Tian Tan Buddha*, *Tin Hau* and *Man Mo* temple; only *Wong Tai Sin* temple was visited in 2014 was close to that in the previous years (see Fig. 3a). From Fig. 3b, we found that June and July had least visitors in all four temples during the whole year. Unlike *Wong Tai Sin* temple that had a peak of visits in February, the other three attracted more visitors in January. However, the tourists' visits fluctuated frequently if we counted them on days (Fig. 3c). For the entire 4 years, there was no visitors uploaded any photos to Flickr on the last days of each month (28th, 29th, 30th or 31st).

The actual number of Flickr visitor was 734 as one person can visit multiple temples per trip (Table 5). *Tian Tan Buddha* was the most popular temple for tourists with 541 visits, followed by *Wong Tai Sin* (126 visitors). *Tin Hau* and *Man Mo* temples had 60 and 53 visits respectively. Table 5 presents the statistics of tourists' visits. Among all 734 tourists, none of them has visited all four temples. Only five of them visited three temples, and 36 visited two. The remaining 94 % tourists only visited one temple, and majority of them went to see the *Tian Tan Buddha*.

In order to have a clearer picture of the tourists' behaviour, we selected a set of users who visited multiple temples and/or visited temples in multiple years and summarized their visits in Table 6. Out from 343 tourists, 17 of them (5 %) matched these criteria, and only four of them visited the temples in different years. Except one visitor was a local resident in Hong Kong, the remaining three of them were from Asia. They visited different temples when they revisited Hong Kong in couple



**Fig. 3** The total number of photos taken in four temples from 2010 to 2014 (a) number of photo taken over years, (b) number of photo taken over months, (c) number of photo taken over days

**Table 5** Distributions of tourists’ visits

	Tian Tan	Wong Tai Sin	Man Mo Temple	Tin Hau Temple	No of visitors
Visited three temples	5	5	1	4	5
Visited two temples	30	26	8	8	36
Visited one temples	506	95	51	41	693
Total	541	126	60	53	734

of years. For those who visited two temples during the same trip, *Tian Tan* temple was the most popular one to tourists (over 92 % of the tourists visited it); and *Wong Tai Sin* was the second popular with 61 % of the tourists took photos. Interestingly, tourists only visited maximum two temples and none of them visited more than two. Besides, from the number of photos uploaded to Flickr indicated that the Asian tourists visited all temples randomly; while the tourists from Europe had rare visit to *Man Mo* or *Tin Hau* temple. For the North American tourists, *Man Mo* temple was the least temple they visited.

**Table 6** Tourists visiting behaviour via photos uploaded

	Region	Tian Tan	Wong Tai Sin	Man Mo Temple	Tin Hau Temple
Tourist 1 <sup>a</sup>	Hong Kong	0	2012, 2013 (33)	0	2013 (5)
Tourist 2 <sup>a</sup>	Asia	2011 (2)	2010 (31)	0	0
Tourist 3 <sup>a</sup>	Asia	2011 (2)	0	2012 (12)	0
Tourist 4 <sup>a</sup>	Asia	0	2011 (10)	2015 (5)	0
Tourist 5	Asia	2010 (105)	0	0	2010 (6)
Tourist 6	Asia	2010 (11)	0	2010 (1)	0
Tourist 7	Asia	2013 (63)	0	0	2013 (10)
Tourist 8	Europe	2010 (13)	2010 (5)	0	0
Tourist 9	Europe	2011 (6)	2011 (8)	0	0
Tourist 10	Europe	0	2011 (1)	2011 (1)	0
Tourist 11	Europe	2013 (1)	2013 (2)	0	0
Tourist 12	Europe	2015 (2)	2015 (2)	0	0
Tourist 13	Europe	2015 (2)	2015 (3)	0	0
Tourist 14	N. America	2012 (2)	0	0	2012 (14)
Tourist 15	N. America	2013 (3)	2013 (41)	0	0
Tourist 16	N. America	2010 (29)	0	0	2010 (1)
Tourist 17	N. America	2014 (42)	2014 (25)	0	0

Note: Numbers in bracket indicated the number of photos uploaded

<sup>a</sup>Repeat visits

## 5 Conclusions

This study attempted to analyze tourists' visit behaviors by taking use of the geotagged photos uploaded by tourists to the social media sites. The data extraction method introduced in this paper impacts attraction managers could make uses of the widely available tourists' photos from online media-sharing sites to collected relevant photos about their attractions so as to understand the tourists' behavior and travel pattern. Moreover, they can also identify the behavioral difference among different among different countries. The more comprehensive data they have, their marketing strategies could be more precise.

## References

- Crandall, D. J., Backstrom, L., Huttenlocher, D., & Kleinberg, J. (2009). Mapping the world's photos. In *Proceedings of the 18th International Conference on World Wide Web* (pp. 761–770). New York, NY: ACM.
- Euromonitor International. (2015). Top 100 city destinations ranking – analyst insight from euromonitor international. Retrieved August 21, 2015, from <http://blog.euromonitor.com/2015/01/top-100-city-destinations-ranking.html>
- Flickr. (2015). Flickr services: The app garden. Retrieved online from <https://www.flickr.com/services/api/> on 18 December 2014.

- HKTb. (2014a). Visitor arrival statistics – Dec 2014. Retrieved August 21, 2015, from [http://securepartnernet.hktb.com/filemanager/intranet/dept\\_info/private\\_20/paper/VAS2002/VAS2014/VAS\\_12\\_2014\\_1.pdf](http://securepartnernet.hktb.com/filemanager/intranet/dept_info/private_20/paper/VAS2002/VAS2014/VAS_12_2014_1.pdf)
- HKTb. (2014b). Visitor profile report 2014. Retrieved August 21, 2015, from [http://securepartnernet.hktb.com/filemanager/intranet/dept\\_info/private\\_20/paper/Visitor-Pro/Profile2014/Visitor\\_Profile\\_2014\\_0.pdf](http://securepartnernet.hktb.com/filemanager/intranet/dept_info/private_20/paper/Visitor-Pro/Profile2014/Visitor_Profile_2014_0.pdf)
- Jaffe, A., Naaman, M., Tassa, T., & Davis, M. (2006). Generating summaries and visualization for large collections of geo-referenced photographs (p. 89). ACM Press.
- Kisilevich, S., Mansmann, F. & Keim, D. (2010). P- DBSCAN: A density based clustering algorithm for exploration and analysis of attractive areas using collections of geo-tagged photos. In *Proceedings of the 1st International Conference and Exhibition on Computing for Geospatial Research and Application Article*. Article no. 38, Bethesda, MD
- Lau, G., & McKercher, B. (2006). Understanding tourist movement patterns in a destination: A GIS approach. *Tourism and Hospitality Research*, 7(1), 39–49.
- Leung, X. Y., Wang, F., Wu, B., Bai, B., Stahura, K. A., & Xie, Z. (2012). A social network analysis of overseas tourist movement patterns in Beijing: the impact of the Olympic games. *International Journal of Tourism Research*, 14(5), 469–484.
- Lew, A., & McKercher, B. (2006). Modeling tourist movements: A local destination analysis. *Annals of Tourism Research*, 33(2), 403–423.
- Pan, S., Lee, J., & Tsai, H. (2014). Travel photos: Motivations, image dimensions, and affective qualities of places. *Tourism Management*, 40, 59–69.
- Park, S., & Nicolau, J. L. (2015). Asymmetric effects of online consumer reviews. *Annals of Tourism Research*, 50, 67–83.
- Syed-Ahmad, S. F., Musa, G., Klobas, J. E., & Murphy, J. (2013). Audience response to travel photos and arab destination image. *Journal of Travel and Tourism Marketing*, 30(1–2), 161–164.
- Tham, A., Croy, G., & Mair, J. (2013). Social media in destination choice: Distinctive electronic word-of-mouth dimensions. *Journal of Travel and Tourism Marketing*, 30(1–2), 144–155.
- Vu, H. Q., Li, G., Law, R., & Ye, B. H. (2015). Exploring the travel behaviors of inbound tourists to Hong Kong using geotagged photos. *Tourism Management*, 46, 222–232.
- Zakrisson, I., & Zillinger, M. (2012). Emotions in motion: Tourist experiences in time and space. *Current Issues in Tourism*, 15(6), 505–523.
- Zhang, X., & Yun, H. J. (2014). Comparative analysis of user-generated and travel agency photo posting in Chinese microblog. *International Journal of Tourism Sciences*, 14(3), 88–105.
- Zheng, Y.-T., Zha, Z.-J., & Chua, T.-S. (2012). Mining travel patterns from geotagged photos. *ACM Transactions on Intelligent Systems and Technology*, 3(3), 56:1–56:18.



# Optimizing the Publication Flow of Touristic Service Providers on Multiple Social Media Channels

Zaenal Akbar, Ioan Toma, and Dieter Fensel

**Abstract** In a multi-channel online communication environment, dissemination of high quality content to multiple channels is a necessity. With the intention of actively communicating and engaging with the audiences on each channel, content should be disseminated to as many channels as possible. Due to the heterogeneity of channels' specifications, the challenge is to find the best possible combination of which content should be disseminated to which channel. In this paper we introduce an approach so called publication flow as a structured way of disseminating content to multiple channels. The proposed approach enables multiple channels content dissemination and at the same time maximizes the dissemination main objective of reaching the widest audiences possible. By defining the challenge as a minimum cost flow problem, an optimal publication flow can be achieved by minimizing the costs (technical, effectiveness and social) of disseminating a particular type of content to a particular channel. We employ our approach to analyse and evaluate how content is disseminated to various social media channels within the tourism industry.

**Keywords** Multi-channel • Publication flow • Linear optimization • Social media

## 1 Introduction

With the development of the Internet in the last decades, a multitude of online communication channels became available, enabling individuals as well as companies, to connect, communicate, and engage with a wide range of audiences in various ways. Being present and active on this multitude of online communication channels is a must nowadays. The challenge lies on how to reach the widest audiences, how to post and when in order to become more visible and finally generate more income. Social media in particular, constitutes an excellent vehicle for fostering relationships with customers (Vries, Gensler, & Leeftang, 2012). However, there are still open challenges when it comes to multi-channel communication and advertisement on social web platforms (Werthner et al., 2015).

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Reaching and attracting the highest number of audiences on every channel requires a multi-channel content dissemination solution. The naïve solution i.e. disseminating every content item to every channels is not always possible, due to a multitude of factors. On one hand, technical factors might prevent content to be accepted by a particular channel. For example uploading a video to Twitter is only possible if the video is less than 30 s, not larger than 512 MB. On the other hand, non-technical factors might affect how a content will be disseminated to several channels. For example in disseminating a story to a Blog and Twitter, the story could be disseminated to the Blog first and then a brief and short version will be disseminated to Twitter including a link to the Blog, such that the audiences of Twitter might have access to the whole story available on the Blog.

In online marketing, the effectiveness is typically measured by the received online engagement. It has been demonstrated that the online engagement is positively related to advertising effectiveness (Calder, Malthouse, & Schaedel, 2009). A total engagement (total involvement, concentration and enjoyment) with the marketing channel (e.g. website) can benefit customers experiences for successful e-commerce practices (Bilgihan, Okumus, Nusair, & Bujisic, 2014).

In this paper, we introduce an effective and efficient solution to disseminate content to multiple social media channels. Our solution relies on an optimization of so called “publication flows” between online communication channels in a way capable of reaching the most audiences possible on multiple channels while increasing the potentiality of receiving higher engagements which ultimately lead to a successful online marketing strategy. Our solution is based on linear optimization approach by minimizing publication costs on each publication flow. Our contributions are mainly in (1) designing and implementing a structured form of content dissemination to multiple online channels, and (2) defining three factors which are affecting how a content will be disseminated to multiple channels. We use the proposed structured form to analyse publication flows of touristic service providers, namely hotels and restaurants located in Austria.

The remainder of this paper is organized as follows: Sect. 2 discuss some related works in content dissemination especially on social media, Sect. 3 describes our model of publication flows, Sect. 4 describes our analysis of publication flows from various social media channels of touristic service providers. Finally, conclusions and future work are outlined in Sect. 5.

## 2 Related Work

We align our work to the broad topic of multi-channel online communication especially content dissemination to social media as an integral part of online marketing strategy. In this section, we list and explain the differences between existing related work approaches and our work.

To have a better chance of visibility in the eyes of the customers, online marketers need to keep their audiences well informed and entertained at the same

time. Being visible on every channel is not enough. One has to actively communicate and engage with audiences in order to make marketing successful. Delivering high quality contents to customers which match their preferences has advantages in customers decisions (Ariely, 2000). In social media, which has a rich variety of information sources (Agichtein, Castillo, Donato, Gionis, & Mishne, 2008), quality of content is not solely determined by the content itself, but also the links between them and the explicit quality ratings from members of the community (such as likes, comments).

Even though there are varying factors that could attract users to engage across social networks, a few intersecting factors can be drawn and categorized into social features (e.g. in-out degrees, user age) and content features (e.g. post length, readability) (Rowe & Alani, 2014). On Twitter, beside the social features (i.e. number of followers and followees), content features URLs and hashtags are also significantly contributing in getting re-tweets (Suh, Hong, Pirolli, & Chi, 2010). On Digg, a content is quickly outdated (the popularity becomes saturated in about a day) while on YouTube, videos keep attracting engagement long after disseminated (Szabo & Huberman, 2010). For brand-related user generated content, YouTube is the strongest site influencer, Twitter is more likely used for engagement in discussions and spreading news, while Facebook is in between the two former channels (Smith, Fischer, & Yongjian, 2012). On Facebook Pages, entertaining and informative contents could significantly improve the level of engagement. Photo is the most attracting post media type, but posting in peak activity hours could reduce the engagement (Pletikosa Cvijikj & Michahelles, 2013). The dominant factor of information propagation on Flickr is social links where the spreading is limited to individuals in the close proximity to the content's uploader (Cha, Mislove, & Gummadi, 2009). Photos with faces will likely receive more engagement on Instagram (Bakhshi, Shamma, & Gilbert, 2014). For weblogs, providing high-chatter topics tend to increase larger spikes which can increase a large reaction (Gruhl, Guha, Liben-Nowell, & Tomkins, 2004). A selective method for social links injection into a social network could also increase information spreading and information reaching (Antaris, Rafailidis, & Nanopoulos, 2014). Controlling the information flow by delivering the most appropriate information to customers can help customers' ability to integrate, remember and understand inputs for their judgments (Ariely, 2000). Giving the audiences a better online experiences through interaction, participation, co-creation, immersion, engagement and emotional hooks are highly important for e-commerce success (Bilgihan et al., 2014). A proper content adaptation could drive a better engagement (Akbar, Garcia, Toma, & Fensel, 2015). There are a few factors that need to be considered for an effective information propagation in multiple networks: the interest-matching users, user negative/positive relations and message timeliness (Shen, Dinh, Zhang, & Thai, 2012). A success viral marketing strategy can be achieved through revenue maximization by finding the right set of customers to influence (Hartline, Mirrokni, & Sundararajan, 2008).

As in the previously mentioned related work, our goal is to find a proper strategy for online marketing on multiple channels especially social media. While the

existing related approaches focus mainly on the social relationships within networks and the content features, our work explores the communication feature, namely the flows between channels. We take advantage of the communication form among multiple channels to properly disseminate a particular type of content, which is eventually providing the best possible online experiences to the customers and could drive a successful online marketing.

### 3 Publication Flow Model

In this section, we introduce our structured content dissemination model. First we introduce publication on multiple channels (Sect. 3.1), then we identify various way of dissemination (Sect. 3.2), formalize them (Sect. 3.3), and finally describe how to compute the publication cost in order to identify the optimal publication flow (Sect. 3.4).

#### 3.1 Publication on Multiple Channels

For exemplification purposes, let us consider the publications flow in Fig. 1. In this scenario, a hotel wants to disseminate on multiple channels (Website, Blog, YouTube, Vimeo, Instagram, Facebook, Twitter, and E-Mail) content about its new weekend offer. First, the textual story will be disseminated to Website, Blog and send by E-Mail. The story on the Website then shared to Facebook, while posted story on Blog will be tweeted to Twitter. Picture related to the offer will be disseminated to Instagram and posted to Blog. The picture on Instagram then shared

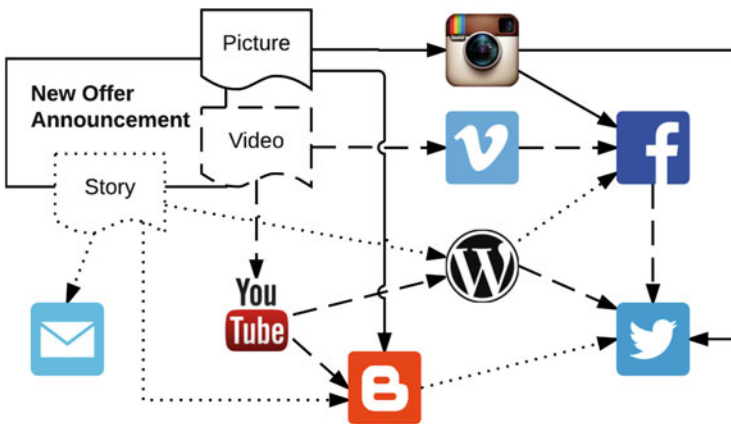


Fig. 1 Illustration of content dissemination to multiple channels

to Facebook and tweeted to Twitter. Video of the new offer will be uploaded to Vimeo and YouTube, where the video on Vimeo will be shared to Facebook then tweeted it to Twitter. The uploaded video on YouTube will be posted to Blog and Website, and finally the video on Website will be tweeted to Twitter.

Obviously, there are many other ways of disseminating this content on the multiple of channels. For example, upload the video directly to Facebook and tweet it to Twitter, shared it to Website and Blog, etc.

### 3.2 Different Ways of Dissemination

Figure 2 illustrates various possible ways of disseminating content  $D$  to four channels  $C_1, \dots, C_4$ . The content can be disseminated directly to all channels, in two steps, or sequentially as shown in Fig. 2a, b, and c respectively.

Since not all contents are suitable to all channels, work so called content adaptation is required to fit content to the target channels as well as to be able to spread it as fast as possible through the network. Unfortunately, the task of content adaptation is still mainly determined and performed by humans. In this context one can see human knowledge as a “publication cost” that is the cost needed to be “paid”, invested by a human agent, in order to fit a content to a channel such that the content can be published to that channel. By using this cost notation, our problem can be categorized as minimum cost flow problem (Edmonds & Karp, 1972; Goldberg & Tarjan, 1987), where we would like to find the best dissemination way out of all possible ways by minimize the content adaptation cost.

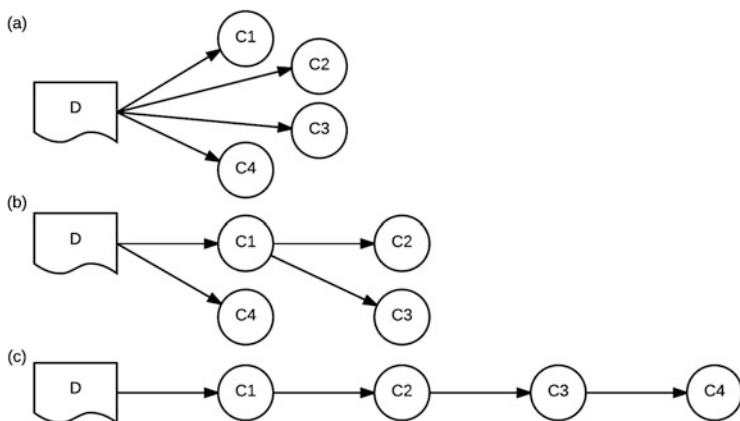


Fig. 2 Various ways of publication flow

### 3.3 *Publication Flow Formalization*

In order to formalize the notion of publication flow, we introduce several definitions which are based on graph theory as follow.

**Definition 1.** *A publication network is a network containing communication channels as vertexes and communication flows as edges.*

A publication network is represented as a directed graph. Given X and Y, two communication channels, represented as vertexes in a publication network. An edge connecting X to Y, represents a communication flow between X and Y, meaning that a publication or dissemination can be performed between X and Y, with X as its source and Y as its target.

**Definition 2.** *Publication capacity is the maximum amount of communication flows from source channel to target channel.*

In online communication, flow of a content can be represented by the types of media constituting the content. We compute publication capacity as the maximum amount of media that flows from one channel to another. For example, the publication capacity for Twitter is 140 characters.

**Definition 3.** *Publication cost is the amount of work required by human agent to publish a content from input channel to target channel.*

A publication cost occurs when work is required to transform a particular type of media in order to be able to publish it to a particular channel. For example, to publish a blog post to Twitter several transformations are required such as shortening the text of the blog to 140 characters, inventing several hashtags that could attract more followers, choosing an image to be included in the tweet, and so on. We use content adaptation notation (Akbar et al., 2015) to measure the work by computing the similarity between an adapted content and its original based on three properties: presentation, hypermedia, and named-entity.

There are many factors affecting content adaptation, for example, let assume we would like to share a video on YouTube to Twitter. There are a few options to determine the required cost of the required content adaptation such as:

- (a) Share the “title, url” of the video to Twitter. The cost for adaptation is relatively simple since those fields can be obtained easily from the video on YouTube.
- (b) Share the “title, url” plus a few hashtags which are obtained from the description of the video. In this case, the cost for adaptation is relatively expensive because we need to determine which words of the descriptions can be representing the video and can be used for hashtags.

From those two possible adaptation solution, intuitively, the former solution has a smaller cost than the latter. Nowadays, content adaptation is mainly performed by human, and each user might have various experiences that can drive how she/he

performs the adaptation (Akbar et al., 2015). Considering this aspect, in our work, the cost is determined by human experts.

To formalize the problem and our solution, let's consider a publication network as a directed graph  $G = (V, E)$  with  $V = \{1, \dots, n\}$  as the set of vertexes and  $E \subseteq V \times V$  as the set of edges with  $w : E(G) \rightarrow \mathbb{R}_+$  and  $c : E(G) \rightarrow \mathbb{R}$  as functions for edge capacities and edge costs respectively. With  $s \in V$  as source and  $t \in V$  as sink, the problem is to find the optimal way of sending an amount of flow  $d$  from  $s$  to  $t$ . The cost of sending a flow  $f$  from a vertex to another vertex through an edge  $e \in E$  can be computed as  $f(e) \cdot c(e)$  and therefore our solution can be represented in linear programming notation as follow:

$$\begin{aligned}
 & \text{minimize} && \sum_{e \in E} f(e) \cdot c(e) \\
 & \text{subject to} && f(e) \leq w(e) \\
 & && f(e \in \delta^+(v)) \leq \sum_{e \in \delta^-(v)} f(e), \forall v \in V, v \neq s, t \\
 & && f(e), c(e), w(e) \geq 0, \forall e \in E(G)
 \end{aligned} \tag{1}$$

where  $\delta^+(\cdot)$  is collection of incoming edges and  $\delta^-(\cdot)$  as collection for outgoing edges. As shown in Eq. (1), the objective is to minimize the total cost of flows on all edges, where: (1) the amount of flow on every edge must be smaller or equal to the edge capacity, (2) the total flow of incoming edges must be smaller or equal to total of outgoing edges for every edge except source  $s$  and sink  $t$ , (3) the amount of flow, edge capacity, and cost are bigger or equal to zero.

For illustration, let's consider a publication flow between Blog to Twitter. In our publication network, there is a directed edge  $e$  connecting vertex Blog to Twitter. The edge capacity  $w$  of  $e$  is 140 characters. There are many possible flows:  $f_1 = 120$  characters with cost  $c_1$ ,  $f_2 = 140$  characters with cost  $c_2$ , and so on. The objective is to find the minimal/optimal flow from these possible combination of flows and costs.

### 3.4 Publication Flow Costs Representation

As mentioned above, the cost for publishing a particular media type with a particular size to a particular channel is determined and specified by the experts. The cost could be affected by various aspects: technical, effectiveness, and social.

**Technical Cost** Technical costs refers to the cost of transforming the content from the source channel into a form that is acceptable (i.e. acceptable by the API) by the target channel. Various techniques for content adaptation such as trimming of the text to a specific size, reducing the size of an image or shortening an URL, could be applied.

**Effectiveness Cost** Effectiveness cost refers to the effectivity of a content adaptation according to engagement probability. For example, adapting a text by only trimming it to a particular size might be less effective than summarizing the text, even though the former solution has less technical cost than the latter.

**Social Cost** Social cost refers to effectiveness of adapted content according to the social relationships. For example, we have a textual content and based on our experiences, audiences in one of our channel is more receptive pictures. In this case it will be more effective to include a picture into the original text when disseminating the content to that channel.

Let  $x, y \in V$  where  $x$  and  $y$  are the source and target channels respectively,  $k(\cdot)$  as function for technical cost,  $l(\cdot)$  as function for effectiveness cost,  $m(\cdot)$  as function for social cost, the cost  $c$  of disseminating content from  $x$  to  $y$  can be computed as:

$$c(x, y) = \frac{w_k \cdot k(x, y) + w_l \cdot l(x, y) + w_m \cdot m(x, y)}{3} \quad (2)$$

In Eq. (2), the cost is defined as weighted average of technical, effectiveness, and social costs, where  $w_k, w_l, w_m$  are weighting factors for each cost. The value of cost is normalized between 0, . . . , 1 where 0 means high quality (e.g. no adaptation is required) and 1 means low quality (e.g. a highest adaptation is required). This is a very intuitive way, where we would like to determine if the technical cost can be reduced by the effectiveness and social costs.

For illustration, let's go back to our example in Fig. 1. Disseminating a video to Twitter is possible technically with a very high cost as the video has to be not longer than 30 s and not larger than 512 MB (e.g. technical cost = 0.9). But socially, we have so many followers on Twitter who would love to learn more about the new offer of the hotel (e.g. social cost = 0). Then, the effectiveness cost can be determined if we should publish to YouTube then to Twitter (e.g. effectiveness cost = 0.25), or publish it to YouTube, embed it to a blog then share it to Twitter (e.g. effectiveness cost = 0.5). In either way, the total cost as the average of those three costs will be reduced.

## 4 Publication Flow of Touristic Service Providers

In this chapter we utilize our model to analyse publication flows of several touristic service providers, namely hotels and restaurants in Austria. The goal of this analysis is to determine how content was disseminated between channels i.e. to find out the actual publication flow and then using our cost model to compute the optimal flow. First, we describe the procedure used in our experiment (Sect. 4.1), then we present our experiment results (Sect. 4.2) and finally we discuss how we computed the publication costs (Sect. 4.3).

## 4.1 Experimental Setup

We collected Facebook accounts of hotels and restaurants from 20 largest cities and towns in Austria<sup>1</sup> from Facebook Place<sup>2</sup> (maximum number of accounts per city/town is 100). Then we crawled publicly available posts from each account. In total, we collected and generated two datasets consist of 105,328 posts from 712 accounts of hotels and 194,500 posts from 1591 accounts of restaurants. To analyse the publication flows from the collected datasets, we employ the following procedures:

1. Identify the “shared content” through field “status\_type = shared\_story” of a post, where the source of the content is specified in the field “link = . . .”
2. For each shared content:
  - 2.1 Identify the type of content through field “type”, select “video” or “link”
  - 2.2 Identify the source of content based on the domain name of its “link”. This input channel does not necessarily have be owned or managed by the service provider itself, it could be owned or managed by other parties for example website of tourist association, independent blog, mass media, etc.
  - 2.3 Select the top 25 of the source of contents, where a channel must be used as input source for at least twice and used by at least two cities/towns
3. For each identified input channel, observe the supported type of contents
4. Estimate the publication costs for each channel
5. Identify the optimal publication flow which has the minimum publication cost

## 4.2 Experiment Results

We use the pre-determined types of content in Facebook (*Video*, *Link*) to categorize the types of shared-content.

**Video** Figures 3 and 4 compare input channels for video used by hotels and restaurants from each city/town. For hotels, the most popular input channels are YouTube, Facebook, Vimeo, Issuu.com, Puls4.com, and SoundCloud.com. Vienna, Graz, Linz, and Salzburg are cities with four or more input channels. Salzburg is the first when it comes to using multiple channels (12 channels by hotels and 9 by restaurants). For restaurants, the popular input channels are similar to the hotels. In addition restaurants use the channel: ServusTv.com. The cities with four or more channels are Innsbruck, Klagenfurt, and Villach.

**Link** Figures 5 and 6 compare input channels for link for hotels and restaurants respectively.

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<sup>1</sup> [https://en.wikipedia.org/wiki/List\\_of\\_cities\\_and\\_towns\\_in\\_Austria](https://en.wikipedia.org/wiki/List_of_cities_and_towns_in_Austria)

<sup>2</sup> <https://www.facebook.com/places/>



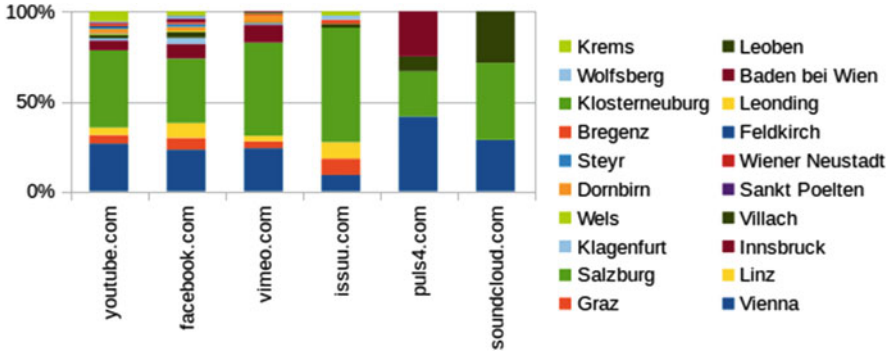


Fig. 3 Hotels' input channels for video

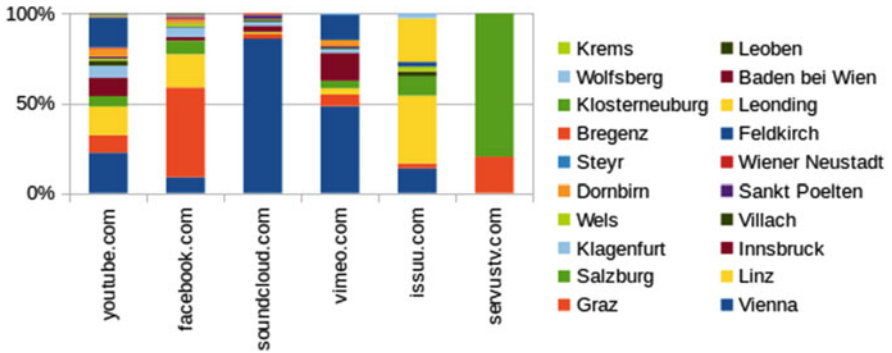


Fig. 4 Restaurants' input channels for video

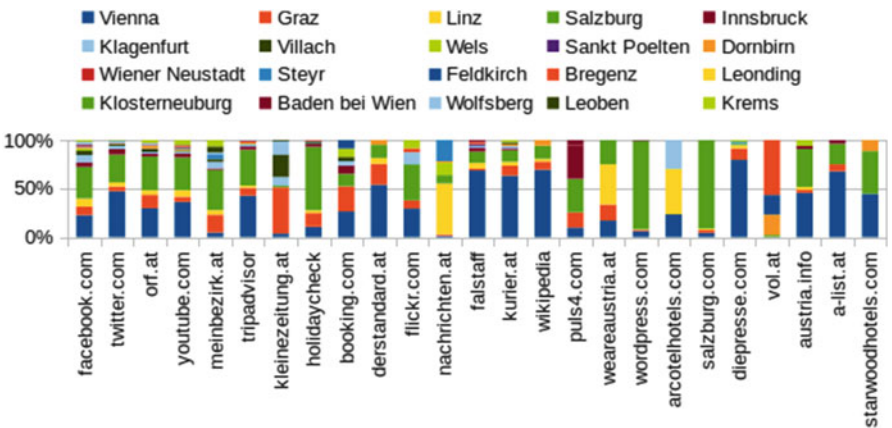


Fig. 5 Hotels' input sources for link

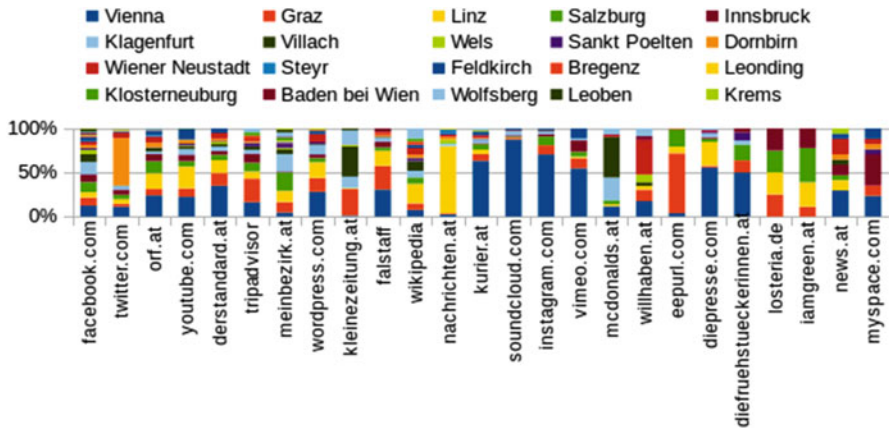


Fig. 6 Restaurants’ input sources for link

For hotels, the popular social media input channels are Facebook (used by 17 cities), Twitter (used by 13 cities), and YouTube (used by 11 cities). Mass media such as ORF.at, KleineZeitung.at, tourist information sites such as TripAdvisor, HolidayCheck, Booking.com, WeAreAustria.at, Austria.info and touristic service providers such as ArcotelHotels.com, StarwoodHotels.com, are all important input channel for hotels.

For restaurants, the top 4 input channels are quite similar with hotels. An Austrian broadcast media ORF.at contributes significant content to both hotels and restaurants. DerStandard.at, MeinBezirk.at, KleineZeitung.at are some other examples of input channels from mass media relevant for restaurants. TripAdvisor is the top contributor from tourist related information sites, while McDonalds.at and Losteria.de are additional channels relevant for restaurants.

### 4.3 Publication Cost Estimation

As we have seen in previous section, multiple channels were used differently by Austrian touristic service providers (hotel, restaurant). A mixture of knowledge was used to determine how content should flow from one channel to another. We observe these knowledge by estimating the publication costs as follow:

1. Technical cost by determine if the media type of content is supported by the channel (0 = supported, 1 = not supported). Since Facebook supports all media types including video and link, then the technical cost is 0.
2. Effectiveness cost by determine the difficulty level of required adaptation.
  - 2.1 The cost is reduced by 0.25 if a channel provides a widget that can be attached in any other sites (the adaptation is specified by the channel itself)

- 2.2 The cost is reduced by 0.25 if a channel provides a Facebook shared button (the adaptation is performed by Facebook, while user could customize it)
  - 2.3 The cost is reduced by 0.5 if a channel is integrated with a Facebook account (the adaptation if fully performed by Facebook)
3. Social cost by determine the social quality level of the channel: 0 (social network), 0.25 (mass media), 0.5 (tourism related information site), and 0.75 (touristic service providers site)

We determined and estimated the cost for each aspect based on our observation on how each aspect is affecting the online visibility of a channel. For example, social cost for mass media is lower than service provider’s website because it could reach relatively wider audiences (has higher visibility). Figure 7 shows estimation results of effectiveness, social and total publication costs from input channels for link which have been used by hotels and restaurants. The effectiveness costs are highly similar with interquartile range (IQR) between 0.25 and 0.75 and the median value of 0.75. Social costs are quite different, for hotels. The IQR is between 0.19 and 0.50 with a median value of 0.25, and for restaurants the IQR is between 0.00 and 0.25 with a median value of 0.25. This result indicates that restaurants are typically using multiple input channels which have high social quality (less social cost), indicating those channels that bear high probability to be visible socially, for example social networks and mass media. By computing the total cost with Eq. (2), we obtain the IQR between 0.17 and 0.33 for both hotels and restaurants, and a median value of 0.25 and 0.29 for hotels and restaurants respectively.

For input channels for link, it seems that the optimal publication flow can be achieved by using input channels that require publication cost in the range 0.17–0.33. Similar procedure were applied to input channels for video, but the number of data items is too small to compare.

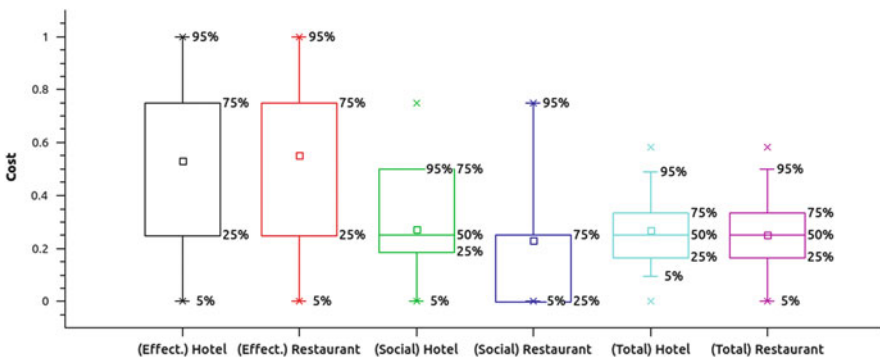


Fig. 7 Publication cost estimation of input channels for link

## 5 Conclusion and Future Work

In this paper we propose a structured approach for content dissemination to multiple online communication channels (i.e. social media). We use the concept of publication flow among multiple channels to determine the best way of disseminating a particular type of content to channels.

We use a linear optimization approach to find the optimal publication flow by minimizing the required publication costs when publishing content to multiple channels. By utilizing three publication costs (technical, effectiveness, social), the minimum cost is determined by considering the amount of flow and flow capacity between channels. We have evaluated our approach by analysing publication flows from Austrian touristic service providers (hotels and restaurants). We were able to compare the publication cost of variety input channels, where the optimal publication flow can be achieved by using channels which have publication costs in a certain range (in our case, the range is 0.17–0.33).

In the future, we would like to extend our work especially in: (1) defining a fine-grained publication costs estimation, (2) extracting and using a richer datasets from vary domain, (3) utilizing various methods to estimate publication costs, especially from experts in social media and online marketing.

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## References

- Agichtein, E., Castillo, C., Donato, D., Gionis, A., & Mishne, G. (2008). Finding high-quality content in social media. In *Proceedings of the 2008 International Conference on Web Search and Data Mining* (pp. 183–194). ACM.
- Akbar, Z., Garcia, J. M., Toma, I., & Fensel, D. (2015). Measuring the impact of content adaptation on social media engagement. In *Proceedings of the 2nd European Conference on Social Media* (pp. 1–10). ACPI.
- Antaris, S., Rafailidis, D., & Nanopoulos, A. (2014). Link injection for boosting information spread in social networks. *Social Network Analysis and Mining*, 4(1), 236.
- Ariely, D. (2000). Controlling the information flow: Effects on consumers' decision making and preferences. *Journal of Consumer Research*, 27(2), 233–248.
- Bakhshi, S., Shamma, D. A., & Gilbert, E. (2014). Faces engage us: Photos with faces attract more likes and comments on instagram. In *Proceeding of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 965–974). ACM.
- Bilgihan, A., Okumus, F., Nusair, K., & Bujisic, M. (2014). Online experiences: Flow theory, measuring online customer experience in e-commerce and managerial implications for the lodging industry. *Information Technology and Tourism*, 14(1), 49–71.
- Calder, B. J., Malthouse, E. C., & Schaedel, U. (2009). An experimental study of the relationship between online engagement and advertising effectiveness. *Journal of Interactive Marketing*, 23(4), 321–331.

- Cha, M., Mislove, A., & Gummadi, K. P. (2009). A measurement-driven analysis of information propagation in the Flickr social network. In *Proceedings of the 18th International Conference on World Wide Web* (pp. 721–730). ACM.
- Edmonds, J., & Karp, R. M. (1972). Theoretical improvements in algorithmic efficiency for network flow problems. *Journal of ACM*, 19(2), 248–264.
- Goldberg, A., & Tarjan, R. (1987). Solving minimum-cost flow problems by successive approximation. In *Proceedings of the Nineteenth Annual ACM Symposium on Theory of Computing* (pp. 7–18). ACM.
- Gruhl, D., Guha, R., Liben-Nowell, D., & Tomkins, A. (2004). Information diffusion through Blogspace. In *Proceedings of the International Conference on World Wide Web* (pp. 491–501).
- Hartline, J., Mirrokni, V., & Sundararajan, M. (2008). Optimal marketing strategies over social networks. *Proceedings of the International Conference on World Wide Web* (pp. 189–198).
- Pletikosa Cvijikj, I., & Michahelles, F. (2013). Online engagement factors on Facebook brand pages. *Social Network Analysis and Mining*, 3(4), 1869–5450.
- Rowe, M., & Alani, H. (2014). Mining and comparing engagement dynamics across multiple social media platforms. *Proceedings of the ACM Conference on Web Science* (pp. 229–238).
- Shen, Y., Dinh, T. N., Zhang, H., & Thai, M. T. (2012). Interest-matching information propagation in multiple online social networks. *Proceedings of the ACM International Conference on Information and Knowledge Management* (pp. 1824–1828).
- Smith, A. N., Fischer, E., & Yongjian, C. (2012). How does brand-related user-generated content differ across YouTube, Facebook, and Twitter? *Journal of Interactive Marketing*, 26(2), 102–113.
- Suh, B., Hong, L., Pirolli, P., & Chi, E. H. (2010). Want to be retweeted? Large scale analytics on factors impacting retweet in twitter network. In *IEEE Second International Conference on Social Computing* (pp. 177–184).
- Szabo, G., & Huberman, B. A. (2010). Predicting the popularity of online content. *Communication ACM*, 53(8), 80–88.
- Vries, L. d., Gensler, S., & Leeflang, P. S. (2012). Popularity of brand posts on brand fan pages: An investigation of the effects of social media marketing. *Journal of Interactive Marketing*, 26(2), 83–91.
- Werthner, H., Alzua-Sorzabal, A., Cantoni, L., Dickinger, A., Gretzel, U., Jannach, D., et al. (2015). Future research issues in IT and tourism. *Information Technology and Tourism*, 15(1), 1–15.

# Discovery and Classification of the Underlying Emotions in the User Generated Content (UGC)

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**Abstract** Nowadays the User Generated Content (UGC) is growing very fast in Internet. Social networks have become a valuable source for knowledge but there is a big gap in the automatic emotional analysis of online textual content. The aim of this research is to determine the emotional qualities of tourists in the perceptions and experiences that underlie in the UGC, through the automatic identification of emotions in twitter texts. The methodology is a quantitative and qualitative content analysis using affective computing techniques. This paper demonstrates empirically the feasibility of the automatic identification of the underlying emotions in the discourses generated by the (UGC), through a powerful ad-hoc software combining Natural language Processing and affective computing field tools. Furthermore, our approach enriches the classification Parrot and Plutchik categorization framework.

**Keywords** Emotions • Affective computing • UGC • Social media analysis • Sentiment analysis • Natural language processing

## 1 Introduction

Emotions in tourism behaviour have gained increasing interest amongst researchers and managers alike. Tourism is all about recreating feeling better both mentally and physically (Gnoth & Zins, 2009). Indeed emotional responses to supply and experience elements in tourism have yet to be appropriately addressed in research. It can be helpful to understanding of how the actual interaction between tourist and environment is experienced.

On the other hand the automatic detection of emotions is a challenging task in Computing. Many Natural Language Processing (NLP) techniques have been proposed to tackle the detection emotions in User Generated Content (UGC), but

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the complexity of the texts makes the identification very difficult. Furthermore, between 2010 and 2020, the amount of information on the Internet will increase by around 40 trillion Gigabytes (Gantz & Reinsel, 2012), so it is crucial to automate the process. Therefore, the automatic detection of emotions in texts is a very important issue to address (Strapparava & Mihalcea, 2007, 2008).

According to Strapparava & Valitutti (2004), affective computing is advancing as a field that allows a new form of interaction between the human and the computer, as well as using a natural language. Picard (1995) said that emotions have a major impact on essential cognitive processes. It is widely perceived that the future of the interaction between humans and computers is growing in areas such as entertainment, emotions, aesthetic pleasure, motivation, attention, and commitment. The study of the relationship between natural language and affective information and how to deal with computational treatment is crucial.

Emotions can be expressed by the spoken word, facial expressions or written texts. There have been many studies about emotions based on voice or facial expressions (Busso et al., 2004), but there has been limited research into written texts (Shivhare & Khethawat, 2012).

For that reason, the aim of this research is to determine the emotional qualities of tourists in the perceptions and experiences that underlie in the UGC, through the automatic identification of emotions in twitter texts. The methodology is a quantitative and qualitative content analysis using affective computing techniques taking as reference the Parrot and Plutchik categorization frameworks. This paper demonstrates empirically the feasibility of the automatic identification of the underlying emotions in the discourses generated by the (UGC), through a powerful ad-hoc software combining Natural language Processing and affective computing field tools.

The structure of the paper is as follows: Sect. 2 presents an overview of research in the field of emotions, as well as the contributions of this article. After that, Sect. 3 explains the methodology followed in this study. Section 4 outlines the case study, Sect. 5 shows the results, and in the last section, the conclusions and future lines are explained.

## 2 Related Work

This section reviews the concept of emotion with the different classification frameworks and the main scientific contributions remarking those related to tourism.

Emotions appear to be highly subjective experiences that may or may not be under the influence of cultural learning rather than universal in their experience, expression and form (Gnoth & Zins, 2009). Kleinginna and Kleinginna (1981a, b) found 92 different definitions of emotions and 102 different ones of motivation. The concept of emotion is difficult to explain and there are four concepts about human

feelings in a dictionary<sup>1</sup> (Liu, 2015) that are affect, emotion, mood and feeling. Affect is a feeling or emotion, especially as manifested by facial expression or body language. Emotion is a mental state that arises spontaneously rather than through conscious effort and is often accompanied by physiological changes. Mood is a state of mind or emotion. Feeling is an affective state of consciousness, such as that resulting from emotions, sentiments, or desires (Serna, Gerrikagoitia, & Alzua, 2014, 2015; Strapparava & Mihalcea, 2007, 2008).

In 1972, Ekman and Friesen (1976) and Ekman, Friesen, and Ellsworth (1972) identified and found six basic emotions: *Anger, Disgust, Fear, Happiness, Sadness* and *Surprise*. Following this work (Ekman, 1993) extended the list of the following emotions: *Amusement, Contempt, Contentment, Embarrassment, Excitement, Guilt, Pride in achievement, Relief, Satisfaction, Sensory pleasure, Shame*.

According to Plutchik (1997), basic emotions are categorized into eight first level bipolar emotions: *Joy, Trust, Fear, Surprise, Sadness, Disgust, Anger* and *Anticipation*. Plutchik created a new conception of emotions; the “wheel of emotions” because it demonstrated how different emotions can blend into one another and create new emotions, in total 32 emotions.

On the other hand, Parrot (2001) classifies basic emotions into six first-level emotions: *Love, Joy, Surprise, Anger, Sadness* and *Fear*. Parrot proposed that basic emotions are not fine-grained enough for sentiment analysis. So apart from the basic emotions, Parrot grouped the emotions into secondary and tertiary group with a total of 146 emotions.

In tourism domain, overall four major areas can be differentiated: Emotions in Satisfaction and Loyalty Research, Affective Attribution and Destination Image Research, Experiences and Emotions and finally Other topics (Gnoth & Zins, 2009).

In the first group, studies cover tourists in general or in a particular destination (Baloglu, 2001; Chang, 2008; Hernández Maestro, Muñoz Gallego, & Santos Requejo, 2007), in the accommodation sector (Barsky & Nash, 2002; ChunBen & BiYan, 2005; Han & Back, 2007), and the restaurant sector (Mattila, 2000; Ryu & Jang, 2007).

In the second group, the majority of destination image studies try to find out which category of attributes weighs more: for decision making prior to the visit (Lin, Morais, Kerstetter, & Hou, 2007; Phillips & Jang, 2007; San Martín & Rodríguez del Bosque, 2008) or explain revisit intention during or after the trip (Chen & Tsai, 2007; MacKay & McVetty, 2002).

In the third group, landscape perceptions (Hull & Revell, 1989; Pralong, 2006) the sense of a place (Stokowski, 2002) and experiences at a penguin-watching attraction (Schänzel & McIntosh, 2000) or at a Maori village (McIntosh & Johnson, 2004) appear as reference object to study the role of emotional responses to these particular exposures.

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<sup>1</sup> [www.thedictionary.org](http://www.thedictionary.org)



Last group include emotions, moods, or other kinds of affective responses as focal part of research question (Gnoth, Zins, Lengmüller, & Boshoff, 2000; Leiper, 1983; Winiarski, 1988).

In addition Bing Liu (2015) explains that existing approaches to emotion or mood classification at the document level are mainly based on supervised learning. The results are used to predict, for instance movement of stock market indices (Zhang, Liu, Lim, & O'Brien-Strain, 2010), the movement of the Dow Jones Industrial Average (DJIA) (Bollen, Mao, & Zeng, 2011), and so on.

To sum up, different classifications of emotions by some of most relevant theorists in the field of emotion in psychology are shown in Table 1.

Although there are many resources that classify emotions, WordNet-Affect (Strapparava & Valitutti, 2004) has its own ontology in OWL language enabling the automatic identification of the emotions. For our purpose this resource is key when working with large volumes of information. Currently, WordNet-Affect contains 4787 words and 2874 synsets.

### 3 Methodology

The methodology of this research is a quantitative and qualitative content analysis following the Walle (1997) approach. Evaluating both quantitative and qualitative paradigms of approach to content analysis, it has been decided that a quantitative approach would be the most suitable in the first stage, as it can conform to the scientific method and produce reliable findings. As the purpose of this research is to have a general overview of the perceived emotions that is as broad as possible, large quantities of data will be analysed. For the specific issue of emotion classifications, apart from quantitative analyses, a more qualitative approach was necessary to obtain results and interpret them, insomuch as qualitative analysis of texts is necessary to help understand their deeper meanings and likely interpretations by audiences (Mariné Roig, 2013; Opoku, 2006).

The full process is based on four main phases: data acquisition; data analysis; data curation and data storage.

#### 3.1 Data Acquisition

It is the process of gathering, filtering and cleaning the unstructured data before making them persistent in a storage solution on which data analysis can be carried out. As Twitter is so wide, broad and deep, the data gathering has been done by selecting trending topics. To download data from Twitter, the twitter4j API is used, a Java library that provides services to interact with Twitter.

**Table 1** Classification of emotions

Author	Grouped emotions
James (1884)	Fear, grief, love, rage
Watson (1919)	Fear, love, rage
McDougall (1921)	Anger, disgust, elation, fear, subjection, tender-emotion, wonder
Arnold (1960)	Anger, aversion, courage, dejection, desire, despair, fear, hate, hope, love, sadness
Mowrer (1960)	Pain, pleasure
Tomkins (1962)	Anger, interest, contempt, disgust, distress, fear, joy, shame, surprise
Ekman et al. (1972)	Anger, disgust, fear, happiness, sadness, surprise
Izard (1977)	Anger, contempt, disgust, distress, fear, guilt, interest, joy, shame, surprise
Russell & Mehrabian, (1977)	Pleasure, excitement, arousal, distress, displeasure, depression, sleepiness and relaxation
Gray (1978)	Anxiety, joy, rage, terror
Weiner and Graham (1984)	Happiness, sadness
Plutchik (1997)	Acceptance, anger, anticipation, disgust, joy, fear, sadness, surprise
Panksepp (1982)	Expectancy, fear, rage, panic
Frijda (1986)	Desire, happiness, interest, surprise, wonder, sorrow
Oatley & Johnson-Laird (1987)	Anger, disgust, anxiety, happiness, sadness
Ekman (1993)	Amusement, contempt, contentment, embarrassment, excitement, guilt, pride in achievement, relief, satisfaction, sensory pleasure, shame
Parrot (2001)	6 primary (love,...), 25 secondary (affection) and 115 tertiary (adoration,...)
Strapparava and Valitutti (2004)	4 primary (positive, negative, neutral and ambiguous) and more than 200 emotional concepts
Turner (2014)	4 primary (satisfaction-happiness, aversion-fear, assertion-anger, disappointment-sadness), first-order elaborations and second-order elaborations

### 3.2 Data Analysis

This process is concerned with making the raw data amenable to use in decision-making. The data analysis module has several steps: first, the tweets are loaded one by one and the language is detected using a Google API (Shuyo, 2010). After that, the texts are corrected using Aspell, a spell checker that is customized with localism and abbreviation. As one of the most important features of Twitter is that the content of the tweets is brief (maximum length is 140 characters), abbreviations are usually used instead of full names, so it is necessary the normalization of the tweet. The proper matching between the abbreviations and the right word is a critical process.

Once the text is corrected, each word is morphosyntactically noted, using Freeling<sup>2</sup> (Padró and Stanilovsky 2012). After that, common nouns and adjectives are considered and ordered by number of occurrences.

### 3.3 *Data Curation*

This phase is the active management of data over its life-cycle to ensure it meets the necessary data quality requirements for its effective usage. In addition, the underlying emotions in text are identified. For this purpose, WordNet, WordNet-Affect ontology,<sup>3</sup> an ad-hoc software and the two classifications according to Plutchik and Parrot emotions are used.

WordNet-Affect<sup>4</sup> ontology was used for classifying emotions from the selected texts. This resource has been developed from WordNet<sup>5</sup> (Miller, 1995) through selection and labelling of synsets representing affective concepts. WordNet is a lexical database that relates hyponyms/hypernyms with sets of synonyms called synsets, which can be interpreted as specialization relations between conceptual categories.

Also emotions have been classified with Plutchik and Parrot classifiers. The reason of this is that Plutchik was a visionary, creating a new conception of emotions, the “wheel of emotions”. In this manner, he identified more advanced emotions based on their differences in intensities. As well, the most nuanced classification of emotions so far is probably Parrots’ 2001 theory. Parrot identified over 100+ emotions and conceptualized them as a tree structured list.

### 3.4 *Data Storage*

This process is the responsible of storing and managing data in a scalable way satisfying the needs of the applications that require access to the data. The downloaded comments after the data curation phase are saved in XML format in a native XML database called Apache Solr. One of the most important features of this open source database is that it is optimized for indexing large volumes of data in real time.

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<sup>2</sup> <http://nlp.lsi.upc.edu/freeling/>

<sup>3</sup> <http://imash.leeds.ac.uk/ontologies/WNAffect/WNAffect.owl>

<sup>4</sup> <http://wndomains.fbk.eu/wnaffect.html>

<sup>5</sup> WordNet Lexical Database: <http://wordnet.princeton.edu>

## 4 Case Study

In the case study, two holiday periods had been analysed: Easter and Summer holidays. In this way, 10 Twitter Trending Topic referring to these concepts have been selected and downloaded. For the first period the selected hashtags were: *#semanasanta*, *#ViernesSanto*, *#DEPJesucristo*, *#JuevesSanto*, *Miércoles Santo*, *#MartesSanto*, *#LunesSanto*, *#Silviacrucis*, *SemanaSanta*, *San Juan Pablo II* and for the second one, *#Tomatina*, *#ADFiesta2*, *#ibiza*, *#verano*, *#vacaciones*, *#bilbao*, *#playa*, *#benidorm*, *#semanagrande*, *#sol*.

In a second filter, the most commented topics were selected: *#semanasanta* and *#vacaciones*, analyzing 6,558 tweets in English and Spanish. Some tweet examples of *semanasanta* and *vacaciones* hashtags are showed:

### *#SemanaSanta Tweets*

tweet1 *208díaspara nuestra pasión, la #semanasanta*

tweet2 *Cristo de la Humildad. Vuelve tras un siglo d ausencia #SemanaSanta #ssanta*

### *#vacaciones Tweets*

tweet1 *Many people wait all the week for Friday, all the year for holidays and all the life to be happy.*

tweet2 *Ahora si, a disfrutar las vacaciones*

In the classification and the identification of emotions, each word is compared with the WordNet-Affect. Sometimes adjectives do not find the corresponding emotion inside the WordNet-Affect ontology, but the same adjective contains an emotion once turned into a noun. To convert adjectives into nouns the WordNet database has been used; for example, the adjective “sad” does not have any emotion associated, but the word “sadness” does. That’s why it is very important to turn every adjective into a noun and to fulfil that identification.

Furthermore, to match some concepts with emotions in WordNet-Affect, it is necessary to find its synonym (S). For this, WordNet is used, to facilitate this process obtaining Synset (semantic) relations. For instance the word *felicity*, has no emotion associated, then the ad-hoc program checks which are synonyms by WordNet and this result is obtained:

- S: (n) **felicity**, **felicitousness**
- S: (n) **happiness**, **felicity**

After that, the program checks whether any of the synonyms that identifies WordNet had any emotion associated, if it is that emotion is obtained. Since the word *felicity* does not appear in the list of emotions but so does its *happiness* synonymous, having *Joy* as its primary category emotion.

The WordNet-Affect taxonomy has more than 200 emotional concepts linked by concept-superconcept relationships. Using the “emotion” affective label, it has been selected 4 categories on the first level that identify 27 emotional states.

**Table 2** WordNet-affect emotions categories

Positive emotion	Negative emotion	Neutral emotion	Ambiguous emotion
Joy	Negative-fear	Apathy	Thing
Love	Sadness	Neutral-unconcern	Gravity
Affection	General-dislike		Surprise
Liking	Ingratitude		Ambiguous-agitation
Enthusiasm	Shame		Ambiguous-fear
Gratitude	Compassion		Pensiveness
Self-pride	Humility		Ambiguous-expectation
Levity	Despair		
Calmness	Anxiety		
Fearlessness	Daze		
Positive-expectation			
Positive-fear			
Positive-hope			

The emotions belonging to the first level, distinguishing synsets according to emotional valence: Positive emotions (*joy#1*, *enthusiasm#1*); Negative emotions (*fear#1*, *horror#1*); Ambiguous, when the valence depends on the context (*surprise#1*); Neutral, when the synset is considered affective but not characterized by valence (*indifference#1*) can be seen in Table 2.

Finally emotions have been classified using the Plutchik emotions wheel and Parrot classifier.

## 5 Results

After analysing the *Trending Topic* mentioned above, Tables 3 and 4 show the results. The first column reflects the most relevant words, the second one the associated emotions with each word, the third one the parent category in the WordNet-Affect (ISA), fourth and fifth the Parrot and Plutchik classifications respectively and last, the number of occurrences of the same word within the trending topic. The category level is shown in parentheses (1: primary, 2: secondary and 3: tertiary) and the primary level emotions are in bold. Table 3 shows the results obtained from the tweets of the trending topic #SemanaSanta, this Trending Topic is related to the Easter holiday season.

*Hope* is not an emotion within WordNet-Affect but *hopefulness* is. *The desire* word has not and associated emotion but its *Wish* synonymous has, so in this case the implementation of the synonym is used.

Table 4 shows the results obtained from the tweets of the trending topic #vacaciones, related to the summer holiday season.

In #vacaciones, appear words such as relaxation, calm and enjoy identified with the *Easiness*, *Calmness* and *Love* emotions respectively.

As *easiness* is a tertiary emotion, to obtain the primary emotion, ISA parent relationship is applied twice. e.g. *Easiness*→*Tranquillity*→*Calmness*.

In the analysed tweets, significant differences can be observed between the two holiday periods. The Easter season can arise feelings such as *Love*, *Passion*, *Hope*, *Humility*, *Respect* or *Caring* related to *Love*, *Hopefulness* and *Lovingness*, *Humility* and *Affection* emotions.

Both holyday seasons have in common emotions like *Happiness* and *Love*, but in Easter holydays appear emotions related to spiritual beliefs.

As it can be seen in Tables 3 and 4 results, the primary emotions following Plutchik and Parrot classifications are Love and Joy for both hashtags #SemanaSanta and #vacaciones. But these models do not categorize significant emotions such as calmness, humility, affection, . . .

As an example, Fig. 1 shows how the Plutchik wheel represents emotions.

**Table 3** Trending topic #SemanaSanta

Word	WordNet-affect		Parrot	Plutchik	Mentions
	Emotion	ISA			
Love	<b>Love</b> (1)	Positive-emotion	<b>Love (1)</b>	<b>Love (1)</b>	33
Passion	<b>Love</b> (1)	Positive-emotion	<b>Love (1)</b>	<b>Love (1)</b>	29
Hope ⇒ <i>hopefulness</i>	Hopefulness (2)	<b>Positive-Hope</b> (1)	<b>Joy (1)</b>	<b>Joy (1)</b>	26
Humility	<b>Humility</b> (1)	Negative-emotion	–	–	10
Respect	Regard (2)	<b>Affection</b> (1)	<b>Love (1)</b>	–	9
Caring	Lovingness (2)	<b>Love</b> (1)	<b>Love (1)</b>	<b>Love (1)</b>	9
Cheerfulness	Cheerfulness (2)	<b>Joy</b> (1)	<b>Joy (1)</b>	<b>Joy (1)</b>	3
Happiness	Happiness (2)	<b>Joy</b> (1)	<b>Joy (1)</b>	<b>Joy (1)</b>	3
Desire ⇒ <i>Wish</i>	Regard (2)	<b>Affection</b> (1)	<b>Love (1)</b>	<b>Joy (1)</b>	2

**Table 4** Trending topic #vacaciones

Word	WordNet-Affect		Parrot	Plutchik	Mentions
	Emotion	ISA			
Happy	Happiness (2)	<b>Joy</b> (1)	<b>Joy (1)</b>	<b>Joy (1)</b>	47
Love	<b>Love</b> (1)	Positive-emotion	<b>Love (1)</b>	<b>Love (1)</b>	19
Relaxation	Easiness (3)	<b>Calmness</b> (1)	–	–	16
Enjoy	<b>Love</b> (1)	Positive-emotion	<b>Love (1)</b>	<b>Love (1)</b>	14
Calm	<b>Calmness</b> (1)	Positive-emotion	–	–	13
Pleasure	<b>Joy</b> (1)	Positive-emotion	<b>Joy (1)</b>	<b>Joy (1)</b>	8
Happiness	Happiness (2)	<b>Joy</b> (1)	<b>Joy (1)</b>	<b>Joy (1)</b>	3

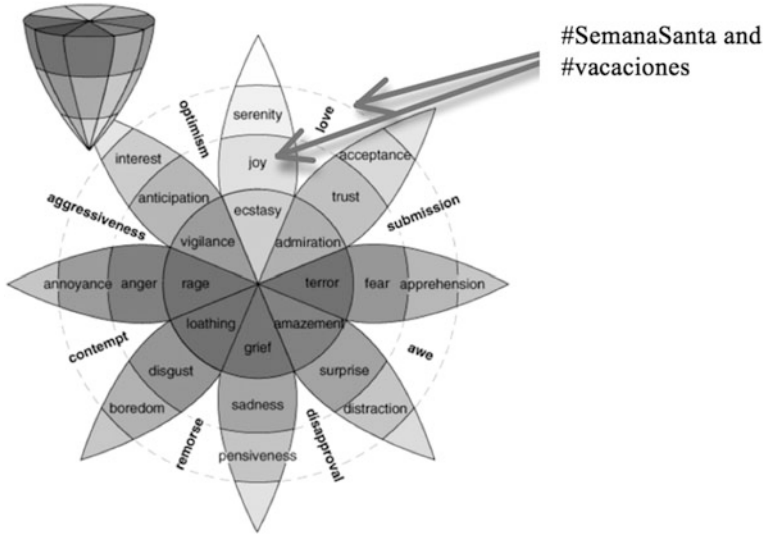


Fig. 1 Plutchik emotion wheel

## 6 Conclusion and Future Lines

About 10 % of the literature review appeared in the 80s, roughly 20 % in the 90s, and the overwhelming majority in the first 7 years of the new millennium. This explosion reflects the increasing interest and maybe relevance of the topic in tourism research.

As it is detailed in the paper, there is a lot of disparity on how researchers choose to group different emotions. Despite all the technology and scientific contributions that are been made, there is not a clear-cut answer on how many emotions the human mind is capable of experience.

In consequence, emotion detection can be seen as an important field of research in human-computer interaction. A sufficient amount of work has been done by researchers to detect emotion from facial and audio information whereas recognizing emotions from textual data is still a fresh and hot research area.

From the results, it can be concluded that the feasibility of the automatic identification of the underlying emotions in the discourses generated by the (UGC) has been empirically validated. Furthermore, our approach enriches the Parrot and Plutchik categorization framework. In this sense a powerful tool to represent affects behind natural language is being developed.

Regarding to the result data, although both case studies are holiday periods, the religious sense of the Easter period has its emotional load. In this sense, as the tourism experience occurs in a certain time and space, the emotional influence of the referred time-space scope may have a clear influence on the experience, opening an interesting way to approach the research of the tourism experience and emotions.

In the future, a multi-language module could be developed to achieve an application, which is compatible with different languages. Prediction models can be significantly improved including mood dimensions.

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## References

- Arnold, M. B. (1960). *Emotion and personality*. New York: Columbia University Press.
- Baloglu, S. (2001). An investigation of a loyalty typology and the multidestination loyalty of international travelers. *Tourism Analysis*, 6(1), 41–52.
- Barsky, J., & Nash, L. (2002). Evoking emotion: Affective keys to hotel loyalty. *Cornell Hotel and Restaurant Administration Quarterly*, 43(1), 39–46.
- Bollen, J., Mao, H., & Zeng, X. (2011). Twitter mood predicts the stock market. *Journal of Computational Science*, 2(1), 1–8.
- Busso, C., Deng, Z., Yildirim, S., Bulut, M., Lee, C. M., Kazemzadeh, A., et al. (2004, October). Analysis of emotion recognition using facial expressions, speech and multimodal information. In *Proceedings of the 6th International Conference on Multimodal Interfaces* (pp. 205–211). ACM.
- Chang, J. (2008). Tourists' satisfaction judgments: An investigation of emotion, equity, and attribution. *Journal of Hospitality and Tourism Research*, 32(1), 108–134.
- Chen, C., & Tsai, D. (2007). How destination image and evaluative factors affect behavioral intentions? *Tourism Management*, 28(4), 1115–1122.
- ChunBen, W., & BiYan, W. (2005). An empirical study of the emotion patterns of hotel guests. *China Tourism Research*, 1(1), 17–35.
- Ekman, P. (1993). Facial expression and emotion. *American Psychologist*, 48(4), 384.
- Ekman, P., & Friesen, W. V. (1976). Measuring facial movement. *Environmental Psychology and Nonverbal Behaviour*, 1(1), 56–75.
- Ekman, P., Friesen, W. V., & Ellsworth, P. (1972). *Emotion in the human face: Guide-lines for research and an integration of findings: guidelines for research and an integration of findings*. New York: Pergamon.
- Frijda, N. H. (1986). *The emotions: Studies in emotion and social interaction*. Paris: Maison de Sciences de l'Homme.
- Gantz, J. & Reinsel, D. (2012). The digital universe in 2020: Big data, bigger digital shadows, and biggest growth in the far east. *IDC iView: IDC Analyze the Future*.
- Gnoth, J., & Zins, A. H. (2009). In M. Kozak & A. Decrop (Eds.), *Handbook of tourist behavior: Theory and practice* (pp. 195–207). New York: Routledge.
- Gnoth, J., Zins, A. H., Lengmüller, R., & Boshoff, C. (2000). Emotions, mood, flow and motivations to travel. *Journal of Travel and Tourism Marketing*, 9(3), 23–34.
- Gray, J. (1978). The neuropsychology of anxiety. *British Journal of Psychology*, 69(4), 417–434.
- Han, H. S., & Back, K. J. (2007). Assessing customers' emotional experiences influencing their satisfaction in the lodging industry. *Journal of Travel and Tourism Marketing*, 23(1), 43–56.

<sup>6</sup> Proyecto Adi: <http://www.tourgune.org/es/4/115/0/0/proyectos-adi.html>. Last accessed 2015-08-27.

<sup>7</sup> Cooperative Research Center in Tourism, CICtourGUNE: [www.tourgune.org/en/index.html](http://www.tourgune.org/en/index.html). Last accessed 2015-08-31.



- Hernández Maestro, R. M., Muñoz Gallego, P. A., & Santos Requejo, L. (2007). The moderating role of familiarity in rural tourism in Spain. *Tourism Management*, 28(4), 951–964.
- Hull, R. B. I., & Revell, G. R. B. (1989). Issues in sampling landscapes for visual quality assessments. *Landscape and Urban Planning*, 17(4), 323–330.
- Izard, C. (1977). Human emotions. *Boom Koninklijke Uitgevers*.
- James, W. (1884). What is an emotion? *Mind*, 9, 188–205.
- Kleinginna, P. R., Jr., & Kleinginna, A. M. (1981a). A categorized list of emotion definitions, with suggestions for a consensual definition. *Motivation and Emotion*, 5(4), 345–379.
- Kleinginna, P. R., Jr., & Kleinginna, A. M. (1981b). A categorized list of motivation definitions, with a suggestion for a consensual definition. *Motivation and Emotion*, 5(3), 263–291.
- Leiper, N. (1983). Why people travel: A causal approach to tourism. Working Paper, Travel and Tourism Division, School of Business and Administrative Studies, Sydney Technical College, New South Wales, Australia.
- Lin, C., Morais, D. B., Kerstetter, D. L., & Hou, J. (2007). Examining the role of cognitive and affective image in predicting choice across natural, developed, and theme-park destinations. *Journal of Travel Research*, 46(2), 183–194.
- Liu, B. (2015). *Sentiment analysis: Mining opinions, sentiments, and emotions*. Cambridge: Cambridge University Press.
- MacKay, K. J., & McVetty, D. (2002). Images of first-time visitors to Queen Charlotte Islands and Gwaii Haanas National Park reserve. *Journal of Park and Recreation Administration*, 20(2), 11–30.
- Mariné Roig, E. (2013). From the projected to the transmitted image: The 2.0 construction of tourist destination image and identity in Catalonia.
- Mattila, A. (2000). When does mood matter? An examination of two types of hospitality service encounters. *Journal of Hospitality and Leisure Marketing*, 7(3), 55–65.
- McDougall, W. (1921). Belief as a derived emotion. *Psychological Review*, 28(5), 315.
- McIntosh, A. J., & Johnson, H. (2004). Exploring the nature of the Maori experience in New Zealand: Views from hosts and tourists. *Tourism (Zagreb)*, 52(2), 117–129.
- Miller, G. A. (1995). WordNet: A lexical database for English. *Communications of the ACM*, 38(11), 39–41.
- Mowrer, O. (1960). *Learning theory and behavior*. New York: Wiley.
- Oatley, K., & Johnson-Laird, P. (1987). Towards a cognitive theory of emotions. *Cognition and Emotion*, 1(1), 29–50.
- Opoku, R. A. (2006). Towards a methodological design for evaluating online brand positioning. (Doctoral dissertation, Industrial Marketing and e-Commerce Research Group, Luleå University of Technology 2006:61).
- Padró, L., & Stanilovsky, E. (2012). Freeling 3.0: Towards wider multilinguality.
- Panksepp, J. (1982). Toward a general psychobiological theory of emotions. *Behavioral and Brain Sciences*, 5, 407–422.
- Parrot, W. G. (2001). *Emotions in social psychology: Essential readings*. Philadelphia: Psychology Press.
- Phillips, W., & Jang, S. C. (2007). Destination image and visit intention: Examining the moderating role of motivation. *Tourism Analysis*, 12(4), 319–326.
- Picard, R. W. (1995). *Affective computing*. Cambridge, MA: MIT Press.
- Plutchik, R. (1997). The circumplex as a general model of the structure of emotions and personality. In R. Plutchik & H. R. Conte (Eds.), *Circumplex models of personality and emotions* (pp. 17–45). Washington, DC: American Psychological Association.
- Pralong, J. P. (2006). Geotourism: A new form of tourism utilising natural landscapes and based on imagination and emotion. *Tourism Review*, 61(3), 20–25.
- Russell, A. J., & Mehrabian, A. (1977). Evidence for a three-factor theory of emotions. *Journal of Research in Personality*, 11(3), 273–294.

- Ryu, K. S., & Jang, S. C. S. (2007). The effect of environmental perceptions on behavioral intentions through emotions: The case of upscale restaurants. *Journal of Hospitality and Tourism Research*, 31(1), 56–72.
- San Martín, H., & Rodríguez del Bosque, I. A. (2008). Exploring the cognitive affective nature of destination image and the role of psychological factors in its formation. *Tourism Management*, 29(2), 263–277.
- Schänzel, H. A., & McIntosh, A. J. (2000). An insight into the personal and emotive context of wildlife viewing at the Penguin Place, Otago Peninsula, New Zealand. *Journal of Sustainable Tourism*, 8(1), 36–52.
- Serna, A., Gerrikagoitia, J. K., & Alzua, A. (2014). Towards a better understanding of the cognitive destination image of Euskadi-Basque Country based on the analysis of UGC. In Z. Xiang & L. Tussyadiah (Eds.), *Information and communication technologies in tourism* (pp. 395–407). ENTER 2014: Proceedings of the international conference in Dublin, Ireland, January 21–24, 2014. Switzerland: Springer.
- Serna, A., Gerrikagoitia, J. K., & Alzua, A. (2015). An auto-coding process for testing the cognitive-affective and conative model of destination image. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism* (pp. 111–123). ENTER 2015: Proceedings of the International Conference in Lugano, Switzerland, February 3–6, 2015. Switzerland: Springer.
- Shivhare, S. N., & Khethawat, S. (2012). Emotion detection from text. arXiv preprint arXiv:1205.4944.
- Shuyo, N. (2010). *Language detection library for java*. <http://code.google.com/p/language-detection/>. Last access 2015-07-09.
- Stokowski, P. A. (2002). Languages of place and discourses of power: Constructing new senses of place. *Journal of Leisure Research*, 34(4), 368–382.
- Strapparava, C., & Mihalcea, R. (2007). Affective text. In *Proceedings of the 4th International Workshop on Semantic Evaluations* (pp. 70–74).
- Strapparava, C., & Mihalcea, R. (2008). Learning to identify emotions in text. In *Proceedings of the 2008 ACM symposium on Applied computing* (pp. 1556–1560).
- Strapparava, C., & Valitutti, A. (2004). Wordnet affect: An affective extension of wordnet. *LREC*, 4, 1083–1086.
- Tomkins, S. S. (1962). *Affect, imagery, consciousness: Vol. I. The positive affects*. New York: Springer.
- Turner, H. J. (2014). The evolution of human emotions. In *Handbook of the Sociology of Emotions*, Volume II: 11–31.
- Walle, A. H. (1997). Quantitative versus qualitative tourism research. *Annals of Tourism Research*, 24(3), 524–536.
- Watson, J. B. (1919). A schematic outline of the emotions. *Psychological Review*, 26(3), 165.
- Weiner, B., & Graham, S. (1984). An attributional approach to emotional development. In C. E. Izard, J. Kagan, & R. B. Zajonc (Eds.), *Emotions, cognition, and behaviour* (pp. 167–191). New York: Cambridge University Press.
- Winiarski, R. (1988). The questionnaire on tourist motivation/QTM: Construction and psychometric characteristics. *Problemy Turystyki*, 11(2), 50–60.
- Zhang, L., Liu, B., Lim, S. H., & O'Brien-Strain, E. (2010). Extracting and ranking product features in opinion documents. In *Proceedings of the 23rd International Conference on Computational Linguistics: Posters* (pp. 1462–1470). Association for Computational Linguistics.

# Differential Destination Content Communication Strategies Through Multiple Social Media

Assumpcio Huertas and Estela Marine-Roig

**Abstract** Tourist destinations convey content through social media to communicate their identity and brand. Therefore, based on Spanish destinations, the aim of this paper is to use content analysis to determine if they communicate both their attraction factors and their emotional values via the different platforms, and if different contents are communicated and different communication strategies exist for the different social media. In general, the results show that destinations largely convey their attraction factors, using specific communication strategies according to the type of destination, and that neither strategies for the differential communication of emotional values that distinguish or identify the destinations nor different communication strategies through different social media are observed.

**Keywords** Social media • Destination brand • Content analysis • Strategic communication • Attraction factors • Emotional values

## 1 Introduction

Social media have revolutionized the communication of tourist destinations (Xiang & Gretzel, 2010). Their interactive potential has enabled the public to publish comments, opinions and appraisals about destinations, their services and their tourism enterprises (Jacobsen & Munar, 2012). This has greatly influenced the decisions regarding tourism taken by other users and tourists (Xiang & Gretzel, 2010). As a result, tourist destinations currently use social media as one of the main channels to communicate with their publics (Huertas & Marine-Roig, 2015). Through them, in addition to information and news, they communicate their identity and brand. The destination brand is a concept of considerable importance

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that enables distinguishing places (Govers & Go, 2009; Morgan, Pritchard, & Piggott, 2003), generating greater intention to visit the place.

In this sense, the contents of communication, understood as topics covered in social media, are the main element for establishing dialogue and generating reactions and engagement of the public with the brand through social media (Valentini, 2015). Content curation is a communication process used to collect, organize and display information related to a particular topic that may be of interest to specific target publics, and thus foster conversation and content sharing (Miralbell, Alzua, & Gerrikagoitia, 2014). In terms of content communication of destination brands it is very important to convey both the tourist attractions of the place and its values and emotional attributes, since both aspects constitute the brand of the territory (Huertas & Marine-Roig, 2015), and to have a clear strategy for the communication of content through different social media (Hudson, Roth, Madden, & Hudson, 2015), since each one has its peculiarities.

Therefore, this paper aims to analyse the content conveyed by Spanish tourist destinations through their various social media platforms from the point of view of communications and public relations, on the one hand to determine whether they communicate both their tourist attractions and their emotional values via the different platforms, and on the other, whether different contents are communicated or if there are different strategies for communication for the different social media addressing different audiences, and according to the different destination types. Thus, this study analyses the contents of 2166 posts on 5 different social media of 25 Spanish destinations, structured according to the following typology: Capital Cities (CC), Littoral Destinations (LD), Heritage Cities (HC), and Mountain/Inland Destinations (MID).

## 2 Background

Given the importance of content strategy in establishing territorial brands, several authors and studies highlight both the tourist attractions of the place as well as its emotional values when communicating tourist destinations and their brands (Baloglu & McCleary, 1999; Echtner & Ritchie, 2003; Hosany, Ekinici, & Uysal, 2006; Huertas & Marine-Roig, 2015), although some (Bigné Alcañiz, Sánchez García, & Sanz Blas, 2009; Michaelidou, Siamagka, Moraes, & Micevski, 2013) also show that through social media, tourist attractions are more and better conveyed than emotional values.

However, it is precisely the communication of the emotional that distinguishes tourist destinations, which provides them with added value and means that they are perceived as a promise of experiences and emotions (Govers & Go, 2009). Previous studies (Hudson et al., 2015) have shown that social media do have a positive influence on emotions and on the tendency towards brands, generating a better brand image and greater intention to visit. The publics that most interact with brands develop a better relationship with them (Aaker, 1997) and decide to visit

the place not in a rational way but, due to emotional involvement, through emotional associations that carry greater satisfaction and incite loyalty (Bowden, 2009). In this respect, Huertas and Marine-Roig (2015) found that the communication of specific emotional brand values through social media generates greater interactivity, which contributes to the creation of a better brand image for tourist destinations. Then the use of social media requires analysis and communication strategies that take into account exactly what needs to be conveyed and what publics need addressing. It requires highly professional communication tools and techniques related to content curation. Social media platforms have great potential, such as their interactive capability, and offer significant advantages over other media (Kent, 2013; Valentini, 2015). But, precisely for this reason, their use should be founded on communication strategies that are consistent with other official communications of the destination.

The contents are the main element for establishing dialogue and generating reactions from the public through social media, as well as for getting audiences to join or follow the different social media platforms (Valentini, 2015). Hence the importance of a content communication strategy and for the content to be selected not only with the aim of informing but also of stimulating dialogue with the publics, getting their reactions and emotional involvement (Huertas & Marine-Roig, 2015), thinking about the interests to the publics. However, to date, social media managers in the field of tourism have, in general, been provided with few guidelines on how to use these new media and what communicative strategies to follow with their use (Hudson et al., 2015).

With the adoption of social media, communication planning is far more complex. The model of two-way communication with publics has become obsolete because communication takes place in a multi-way diachronic process of construction of meanings in which many and varied publics are involved (Van Ruler, 2015). Therefore, the process of strategic planning and of the creation of communication strategies has also changed because the publics participate, create new meanings and affect the image of the destinations throughout the communicative process. The image of a destination is formed from the contents of many sources of information because users look for information on several platforms (Marine-Roig, 2015). Therefore, tourist destinations' communication campaigns should be strategically planned through different social media but also in conjunction with the traditional media.

Besides, each type of social media offers a different potential that makes it useful for different followers or publics (Plowman, Wakefield, & Winchel, 2015). Munar and Jacobsen (2014) emphasize that social networks like Facebook involve greater sociability than review sites. In contrast, review sites are distinguished by the practical utility of their content, which helps other tourists choose better. Regarding the type of content, more textual and narrative content is most prevalent in blogs whereas visual and more experiential content dominates photo and video-sharing sites.

The publics choose social media according to their interests and motivations and also depending on whether they want to search for or share information. Those who

are in search of information on review sites are publics that need the appraisals of others to make safer choices, and those who publish their appraisals are more altruistic publics who are motivated to help other tourists; besides, those who wish to share their experiences are more hedonistic or self-centred (Munar & Jacobsen, 2014). Thus, communications managers and social media managers at tourist destinations should embrace the potentialities of each of the social media, they should know how the publics use them, know what needs they cover with each of them (Burton & Soboleva, 2011), who produces and shares contents on them (Llodrà-Riera, Martínez-Ruiz, Jiménez-Zarco, & Izquierdo-Yusta, 2015) and target their communications strategically.

With the emergence of social media it was thought that it would be very difficult to segment the publics and get access to specific audiences through these new platforms. But it has now been shown that through social media, segmented digital publics can be reached with good planning and strategic communication and with interesting, targeted contents for these specific audiences (Plowman et al., 2015). Therefore, another challenge for tourist destination communication managers is not to attempt to be equally present in all existing social media but to identify through which platforms different publics are accessible, to strategically select the social media and convey strategic communication contents through each one (Plowman et al., 2015).

Hence, this paper aims to analyse the content that the Spanish tourist destinations convey through the different social media platforms they have for two purposes. First, we wish to find out if they communicate both their tourist attractions and their emotional values through the various platforms. And secondly, we wish to find out if different contents are communicated or if there are different communication strategies for the different social media because they also target different audiences.

This paper is within the mainstream of studies on social media that analyse how tourist destinations use social media in their communication both in the fields of communication and public relations (Moreno, Navarro, Tench, & Zerfass, 2015) and tourism (Fotis, Buhalis, & Rossides, 2012; Jacobsen & Munar, 2012; Xiang & Gretzel, 2010). These studies give interesting practical recommendations for organizational communication through social media such as establishing dialogue with the publics by encouraging participation and comments (Kent, 2013) or opening up participation by the publics but at the same time pursuing the goals of the organization (Macnamara & Zerfass, 2012). Most of these studies analyse the different social media separately and not jointly (Hyun & O'Keefe, 2012; Llodrà-Riera et al., 2015), obtaining partial appraisals. The aim of this paper, however, is to analyse what tourist destinations communicate to learn whether they use different communication strategies for different social media to be able to get access to different audiences.

### 3 Methodology

To find out what contents are published by Spanish tourist destinations through their most used official social media: Facebook (social network), Twitter (microblog), YouTube (video-sharing), Flickr (photo-sharing) and blogs (Huertas & Marine-Roig, 2015) and analyse whether they convey their brand with their attraction factors and emotional values, we conducted a content analysis of the last 25 publications from 1 July 2014 in these official social media of the tourist destinations analysed.

The sample of destinations analysed consisted of 24 Spanish tourist destinations from 5 Autonomous Regions, corresponding to geographical areas divided by the market research company Nielsen ([www.nielsen.com](http://www.nielsen.com)) according to their relatively homogeneous market characteristics and due to being representative of the entire Spanish territory: Andalusia, Canary Islands, Catalonia, Galicia and Madrid. These destinations were divided into four contrasting destination typologies: capital cities (CC), littoral destinations (LD), heritage cities (HC) and mountain + inland destinations (MID), derived from the typologies specified in the manual of local tourism management models of the Spanish Ministry of Industry, Tourism and Trade (FEMP, 2008), which are considered representative of all types of Spanish tourist destinations. On this basis, one type of destination was selected for each community when possible (Madrid does not have LD). Not all destinations had the five social media but needed at least two with links to the official tourist website to be selected. Finally, a total of 2166 posts were analysed (Table 1).

To conduct content analysis on online media, some authors identify different topics in the communication of destinations (Beerli & Martin, 2004; Huertas & Marine-Roig, 2015; Marine-Roig & Anton Clavé, 2015) such as natural resources, leisure and recreation, culture, art, history, atmosphere, transportation, accommodation, activities, shopping, climate, etc. However, to analyse destination brand communication, thematic content analysis is not enough. In this respect, some studies build specific analysis templates concerning brand personality attributes (Aaker, 1997), among others, which have been widely used in research (De Moya & Jain, 2013; Huertas & Marine-Roig, 2015) specifically for tourist destination brands. For this reason in our study we analysed the two dimensions of destination brands (Baloglu & McCleary, 1999; Echtner & Ritchie, 2003, Huertas & Marine-Roig, 2015): attraction factors, destinations' assets of interest, and emotional

**Table 1** Total posts analysed per destination type and social media

	Facebook	Twitter	YouTube	Flickr	Blog	Total
Capital City	214	181	90	99	40	624
Littoral Destination	220	253	126	99	41	739
Heritage City	147	186	102	50	10	495
Mountain + Inland Dest.	109	125	64	2	9	308
Total	690	745	382	249	100	2166

values. Therefore, the items used in our methodology to analyse brand communication content were the following:

- (a) Attraction factors: Nature (Nature and natural landscape, Rural landscape, Mountain, Ecotourism); Tangible Heritage (Sites, History, Religion, Works of Art, Museums); Cityscape (Architecture, Urban planning/landscape); Intangible Heritage (Intangible heritage/popular culture/traditions, Anthem/Flag/National Symbols); Gastronomy (Food/Cuisine, Wine Tourism); Leisure (Urban and cultural leisure/shows, Night life, Shopping); Sun and Beach (Sea/Beach, Sun, Climate/Weather); Business/trade; Sports (Hiking, Winter Sports, Water Sports, Adventure Sports, Elite Sports, Other Sports); Technology (Social Media/ICT, Technology, Innovation); Services (Hotel/Accommodation, Transport, Other services); Things to Do; Agenda; Institutional and Non-tourist information.
- (b) Emotional/personality values: we used an adaptation of the “Brand Personality Scale” by Aaker (1997), which has been extended with other values relevant for the analysis of tourism destinations: Sincerity: Down-to-earth (Family-oriented, Down-to-earth, Sustainable), Honest (Calm, Real, Traditional, Honest), Wholesome (Original, Wholesome; Quality of Life), Cheerful (Happiness, Sentimental, Friendly); Excitement: Daring (Trendy, Daring, Exciting, Exotic, Fashionable), Spirited (Cool, Spirited, Dynamic, Vital, Fresh, Young, Sensorial), Imaginative (Unique/different/diverse, imaginative, creative), Up-to-date (up-to-date, independent, contemporary, modern), Cosmopolitan (Cosmopolitan, Tolerant, Hospitable); Competence: Reliable (Reliable, Hardworking, Secure/safe, rigorous/responsible/Pragmatic), Intelligent (intelligent, technical, corporate, innovative), Successful (Successful, Leader, Ambitious, Powerful); Sophistication: Luxurious (Glamorous, Luxurious), Charming (charming, smooth, romantic, magical); Rugged: Outdoorsy (Outdoorsy, Get-away, Recreational), Tough (Tough, Rugged, non-conformist).

Content analysis was performed manually by the researchers via analysis templates that included the established attraction factors and brand values, with the possibility of adding new ones if necessary. This was conducted by reading the text of posts and looking for explicit contents, and in the case of photographs by analysing both the text (title, footer) and the picture. The analysis was first conducted separately and then pooled. In the event of disagreement the post was not classified in that category.

## 4 Results

### 4.1 *Attraction Factors vs. Emotional Values and Attributes*

As Table 2 shows, for all destination types, attraction factors are more present in posts than emotional values. This difference is greater in the case of MID. These



**Table 2** Attraction factors vs. emotional values per destination and media type

	CC	LD	HC	MID	Facebook	Twitter	YouTube	Flickr	Blog
Attractions	772	1501	1022	752	1420	1010	961	432	224
Emotional V.	590	1257	824	292	930	534	606	633	260

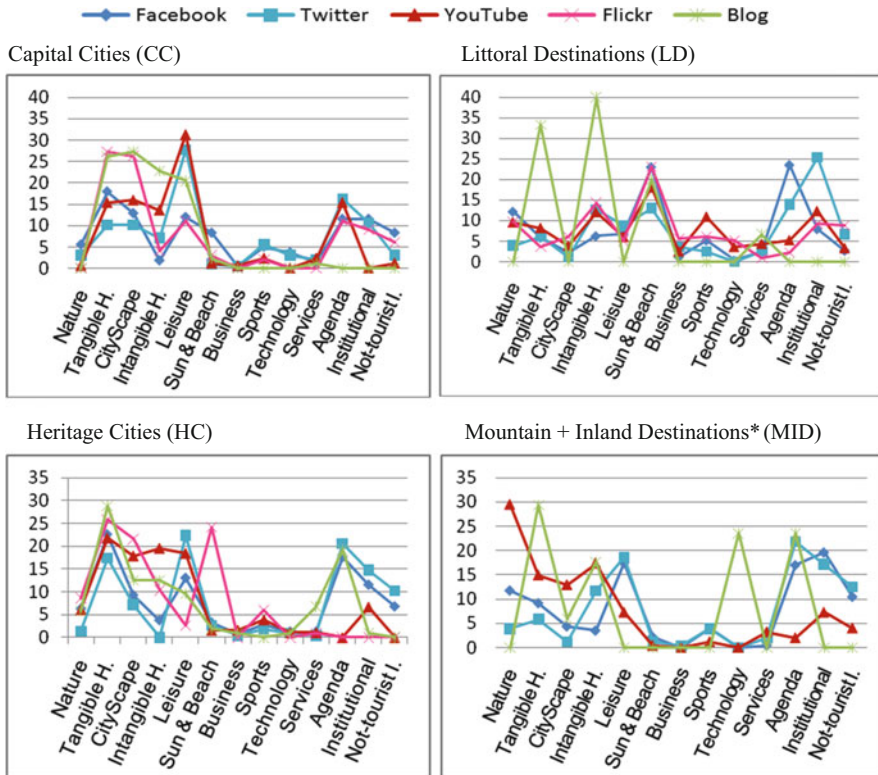
results, support previous studies (Bigné Alcañiz et al., 2009; Michaelidou et al., 2013) in that emotions are not so well communicated as attraction factors. However, by social media type, we see that attraction factors are not always prevalent over emotional values. While for Facebook, Twitter and YouTube the mention of attraction factors prevails, in the cases of Flickr and Blogs emotional values are more often expressed. This could show a certain ease or inclination of some social media to express emotional values (Flickr with photographs and Blogs with multimedia contents), or some preference of destination managers to use them for this purpose, while other social media such as Twitter, which enables only very short messages, are used to communicate attraction factors.

## 4.2 *Attraction Factors Content Analysis*

The first notable aspect is that the different types of destinations communicate different attraction factors related to their tourist typologies. For example, in total, adding up the different social media, in CC, Leisure is the most mentioned attraction factor, followed by Tangible Heritage, CityScape and Agenda. In the case of LD, as expected it is Sun and beach which is most common, followed by Intangible and Tangible Heritage, and Agenda. In HC it is Tangible Heritage, followed by Leisure and Agenda. However, in MID the most mentioned element is Agenda, which was not expected, followed by Tangible Heritage, Intangible Heritage and Nature. In all four destination typologies, Agenda-related contents are very prominent and show that to a great extent social media are used by destinations as news and agenda channels.

If we analyse the data considering different social media types we see that the intensity with which the different elements are promoted is the most homogeneous in the case of CC. Remarkably, Tangible Heritage and CityScape are most intensely promoted through Flickr and the Blog, and Leisure through YouTube and Twitter. Facebook is used most intensely to communicate Tangible Heritage but it is the medium with the greatest variety of elements distributed in it.

In the case of LD it is remarkable that blog content mostly focuses on Intangible and Tangible Heritage and to a lesser degree on Sun & Beach. The rest of social media have a high point in the Sun & Beach factor. However, Agenda is the most common theme on Facebook, and Institutional on Twitter, showing these social media are mainly used as news/agenda feeds and to disseminate activities not related to tourism (Fig. 1).



**Fig. 1** Attraction factors per social media and destination type. \*MID had 100 % of Nature content in Flickr posts, this has not been plotted in the graph to better appreciate the other data

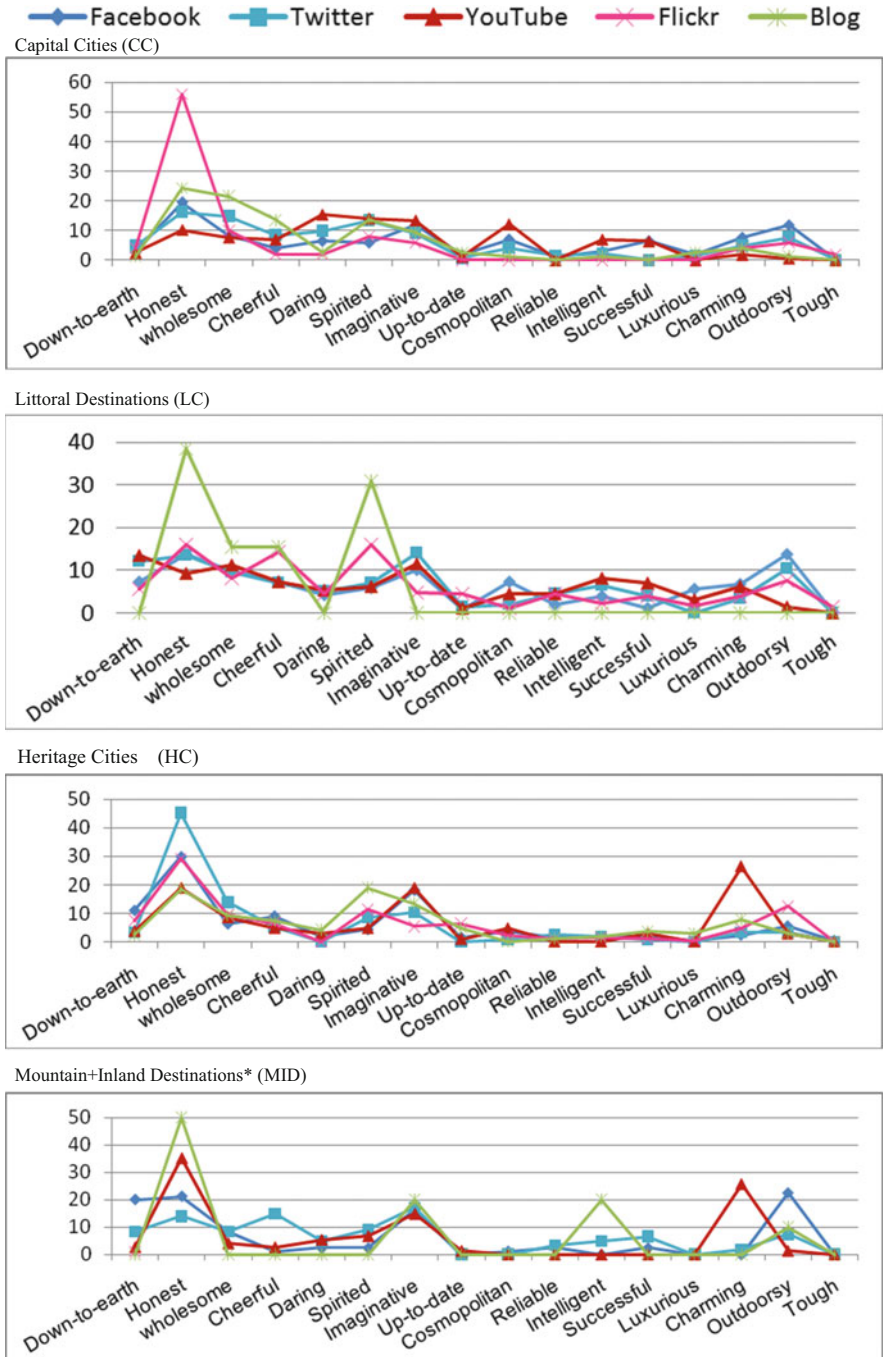
In the case of HC, as expected, Tangible Heritage is the most highly promoted element on Flickr, Blog, YouTube and Facebook. In Twitter, Leisure is the most promoted attraction. There is also a spike of the Sun & Beach element in the case of Flickr, which is mainly explained by pictures portraying the sun and good weather. Concerning MID, Facebook and Twitter are mainly used to convey Institutional messages and Agenda, and elements related to Leisure. Then YouTube and Flickr are clearly used to promote nature and the Blog is used mainly to promote Tangible Heritage-related contents. In this respect, as a general tendency we see that YouTube and Flickr are most clearly used to promote the main elements related to the identity of each of the destination typologies (e.g. Nature in MID). Then, Facebook and Twitter, usually the most active social media, are strongly used to communicate Agenda and Institutional matters, although in some cases they are also used very strongly to communicate specific identity elements. In turn, Blogs are used in all cases for the promotion of Tangible Heritage, probably due to the unrestricted length of posts. In this respect a difference can be observed between social media which use text (Facebook and Twitter) and video/image-based social media: YouTube or Flickr.

### 4.3 *Emotional Values Content Analysis*

In the case of emotional values and attributes, in all four types of destination, Honest values are the most mentioned, especially the Traditional values subcategory. In this respect, social media are used to communicate the Traditional, authentic and sincere values of destinations. Then come, for all four types of destination, the emotional values Spirited (Cool, Dynamic and Young are prominent subcategories) and Imaginative (Unique/different/diverse subcategory is predominant), which are both related to Excitement. However, different types of destinations do not seem to transmit different emotional values according to their tourist typologies, as the values transmitted are very similar. We only observe some slight differences in that MID communicate Outdoorsy attributes more strongly than the others, HC Charming values (seductive and romantic attributes) and LD Cheerful attributes. Now looking at the results by destination and types of social media (Fig. 2), it is observed that for all social media, except for YouTube, the Honest (traditional) values are the most prominent. This is especially true in the case of Flickr. For the rest of emotional values, no remarkable differences are appreciated among the different social media.

In the case of LD, only Blogs very clearly convey Honest and Spirited-related values. In the case of Flickr, the most prominent attributes are Honest, Cheerful and Spirited; for Twitter, Imaginative, and for Facebook, Outdoorsy. However, these differences are minimal and the values in the different social media are quite indistinctive. Concerning HC, for all social media except for YouTube, Honest-related attributes are the most communicated, especially strongly in the case of Twitter. In the case of YouTube it is the Charming (seductive and romantic) values that are most prominent. However, there is no clear distinction among different social media channels either. Finally, in the case of MID, Honest-related attributes are the most prominent in YouTube and in the Blog; Wholesome, in the case of Flickr, Outdoorsy, in the case of Facebook, and Imaginative, in the case of Twitter. It is in these types of destinations that the distinction among the different social media is greatest.

The general tendency here is that neither the different types of destinations nor the different social media channels can be distinguished by their emotional contents, and hence no strategy can be appreciated. Arguably, the fact that the emotional values promoted are very similar across the different social media for the same destination type could indicate that destinations aim to promote exactly the same emotional values in all the different media to achieve a strong brand. However, we believe this is not the case because no specific values stand out from the rest. All values are promoted with similar low intensity, without any indication of a specific plan.



**Fig. 2** Emotional values per destination type and social media. \*MID had 100 % wholesome values in Flickr posts, this has not been plotted to better appreciate the other data

## 5 Discussion and Concluding Remarks

Contents that are conveyed through social media are key to generate engagement and dialogue with the publics (Miralbell et al., 2014; Valentini, 2015) and to create a strong brand image which distinguishes destinations from others and makes them more attractive (Morgan et al., 2003). Both attraction factors and emotional values should be an integral part of destination brand communication. However, our results show that, supporting previous findings (Bigné Alcañiz et al., 2009; Michaelidou et al., 2013), in general all destination types communicate more contents related to attraction factors than emotional values through social media. Besides, our results also support Munar and Jacobsen (2014) in that in photo-sharing and video-sharing social media, experiential or more emotional contents prevail, because it is Flickr and Blog posts that convey more emotional values than attraction factors, while Twitter and Facebook (more text-based) communicate more attraction factors. This supports that photographs and images have a great capacity to communicate emotional values (Morgan & Pritchard, 1998).

Concerning the initial aim of whether different types of destinations communicate different content through different social media or have strategies in this respect, our results show that in terms of attraction factors, the different types of destinations most strongly communicate elements that are unique to them or that identify them (e.g. Sun & Beach in LD). Moreover, in terms of attraction factors we can distinguish that some elements are more prominent than others, in certain social media, and that blogs are strongly used to communicate Tangible Heritage. The greatest differences can be observed between social media which use text (Facebook & Twitter) and social media based on photographs or video (YouTube and Flickr), indicating possible strategies in this respect. However, it is in the most used social media, Facebook and Twitter, that generic themes (Agenda and Institutional) are most present, indicating a possible weakness if we consider that unique or specific attraction factors generate more user reactions and engagement (Huertas & Marine-Roig, 2015). Conversely, in the case of emotional values and attributes, in all destination typologies the values transmitted are very similar, centred on Honest-traditional values, and are thus indistinctive. In terms of the transmission through different social media of emotional values, no remarkable differences are identified either, and no specific values stand out from the rest. Hence, no specific strategies concerning emotional content can be identified.

The studies conducted to date (Bigné Alcañiz et al., 2009; Michaelidou et al., 2013) have demonstrated that attraction factors are much better transmitted than emotional values, but the causes of this remain uncertain: whether this was because the characteristics of the social media facilitated the communication of attraction factors to the detriment of emotional values, because communicating intangible emotional values is more complicated per se, or due to the little interest of communicators in transmitting the values of the brand. In this respect, this paper shows that social media have the capacity to convey the brand's emotional values, especially those that use images, but that emotional values are usually not taken into

account in the communications strategies to set destination brands apart. This paper contributes to identifying a relational and communicational problem of tourist destinations through social media, which is that emotional values are not given sufficient importance in communication strategies. Besides, this research also contributes to identifying that content curation strategies through different social media are incipient in general, and non-existent in the case of the transmission of emotional values.

Therefore, communication social media managers should be aware of the different potentialities of each social media and adopt accordingly different content and communication strategies directed at certain target publics, especially emphasizing emotional values. Moreover, in a multi-way communication context, strategies should be created in a more flexible and interactive way, throughout the whole process, taking into account the participation of and the contents generated by the public as well as those they themselves have created.

Some limitations of this study are that this analysis was conducted over a relatively short period of time and for specific types of destinations. In future studies it would be interesting to compare the emotional values in social media communicated by tourists' experiences at a destination with those communicated by the destination.

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## References

- Aaker, J. L. (1997). Dimensions of brand personality. *Journal of Marketing Research*, 34(3), 347–356.
- Baloglu, S., & McCleary, K. W. (1999). A model of destination image formation. *Annals of Tourism Research*, 26, 868–897.
- Beerli, A., & Martin, J. D. (2004). Factors influencing destination image. *Annals of Tourism Research*, 31(3), 657–681.
- Bigné Alcañiz, E., Sánchez García, I., & Sanz Blas, S. (2009). The functional-psychological continuum in the cognitive image of a destination. A confirmatory analysis. *Tourism Management*, 30(5), 715–723.
- Bowden, J. (2009). Customer engagement: a framework for assessing customer-brand relationships: The case of the restaurant industry. *Journal of Hospitality Marketing and Management*, 18(6), 574–596.
- Burton, S., & Soboleva, A. (2011). Interactive or reactive? Marketing with Twitter. *Journal of Consumer Marketing*, 28(7), 491–499.
- De Moya, M., & Jain, R. (2013). When tourists are your "friends": Exploring the brand personality of Mexico and Brazil on Facebook. *Public Relations Review*, 39(1), 23–29.
- Echtner, C. M., & Ritchie, J. R. B. (2003). The meaning and measurement of destination image. *Journal of Tourism Studies*, 14(1), 37–48.

- FEMP & TourSpain (Eds.) (2008) *Modelos de gestión turística local: Principios y prácticas*. Federación Española de Municipios y Provincias, Secretaría General de Turismo, Madrid, Spain
- Fotis, J., Buhalis, D., & Rossides, N. (2012). Social media use and impact during the holiday travel planning process. In Fuchs, Ricci & Cantoni (Eds.), *Information and Communication Technologies in Tourism 2012*. Proceedings of the International Conference in Helsinborg, Sweden. Vienna: Springer.
- Govers, R., & Go, F. M. (2009). *Place branding: Glocal, virtual and physical identities, constructed, imagined and experienced*. Hampshire: Palgrave Macmillan.
- Hosany, S., Ekinci, Y., & Uysal, M. (2006). Destination image and destination personality: An application of branding theories to tourism places. *Journal of Business Research*, 59, 638–642.
- Hudson, A., Roth, M. S., Madden, T. J., & Hudson, R. (2015). The effects of social media on emotions, brand relationship quality, and word of mouth: An empirical study of music festival attendees. *Tourism Management*, 47, 68–76.
- Huertas, A. & Marine-Roig, E. (2015). Destination brand communication through the social media: What contents trigger most reactions of users? In I. Tussyadiah & A. Inversini (Eds.), *Information and Communication Technologies in Tourism 2015* (pp. 295–308), Proceedings of the International Conference in Lugano, Switzerland. Vienna: Springer.
- Hyun, M. Y., & O’Keefe, R. M. (2012). Virtual destination image: Testing a tele-presence model. *Journal of Business Research*, 65(1), 29–35.
- Jacobsen, J. K. S., & Munar, A. M. (2012). Tourist information search and destination choice in a digital age. *Tourism Management Perspectives*, 1(1), 39–47.
- Kent, M. L. (2013). Using social media dialogically: Public relations role in reviving democracy. *Public Relations Review*, 39(4), 337–345.
- Llodrà-Riera, I., Martínez-Ruiz, M. P., Jiménez-Zarco, A. I., & Izquierdo-Yusta, A. (2015). A multidimensional analysis of the information sources construct and its relevance for destination image formation. *Tourism Management*, 48, 319–328.
- Macnamara, J., & Zerfass, A. (2012). Social media communication in organizations: The challenges of balancing openness, strategy and management. *International Journal of Strategic Communication*, 6(4), 287–308.
- Marine-Roig, E. (2015). Identity and authenticity in destination image construction. *Anatolia – An International Journal of Tourism and Hospitality Research*, 26(4), 574–587.
- Marine-Roig, E. & Anton Clavé, S. (2015). Tourism analytics with massive user-generated content: A case study of Barcelona. *Journal of Destination Marketing and Management*. doi:10.1016/j.jdmm.2015.06.004
- Michaelidou, N., Siamagka, N. T., Moraes, C., & Micevski, M. (2013). Do marketers use visual representations of destinations that tourists value? Comparing visitors’ image of a destination with marketer-controlled images online. *Journal of Travel Research*, 52(6), 789–804.
- Miralbell, O, Alzua, A., & Gerrikagoitia, J. K. (2014). Content curation and narrative tourism marketing In Z. Xiang, & I. Tussyadiah (Eds.). *Information and Communication Technologies in Tourism 2014*. Vienna, Austria: Springer
- Moreno, A., Navarro, C., Tench, R., & Zerfass, A. (2015). Does social media usage matter? An analysis of online practices and digital media perceptions of communication practitioners in Europe. *Public Relations Review*, 41, 242–253.
- Morgan, N., & Pritchard, A. (1998). *Tourism promotion and power: Creating images, creating identities*. Chichester: Wiley.
- Morgan, N., Pritchard, A., & Piggott, R. (2003). Destination branding and the role of the stakeholders: The case of New Zealand. *Journal of Vacation Marketing*, 9(3), 285–299.
- Munar, A. M., & Jacobsen, J. K. S. (2014). Motivations for sharing tourism experiences through social media. *Tourism Management*, 43, 46–54.
- Plowman, K. D., Wakefield, R. I., & Winchel, B. (2015). Digital publics: Tracking and reaching them. *Public Relations Review*, 41, 272–277.

- Valentini, C. (2015). Is using social media “good” for the public relations profession? A critical reflection. *Public Relations Review*, *41*, 170–177.
- Van Ruler, B. (2015). Agile public relations planning: The reflective communication scrum. *Public Relations Review*, *41*, 187–194.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, *31*(2), 179–188.



# Destination Image Gaps Between Official Tourism Websites and User-Generated Content

Estela Marine-Roig and Salvador Anton Clavé

**Abstract** The aim of this paper is to analyse and compare destination image on official tourism websites with the image expressed by tourists in travel blogs and reviews in order to assess image congruency and identify image gaps at different geographical brand levels. This is done through a massive computerized semi-automatic content analysis of attraction factors and geographical elements on official tourism websites and in 46,576 travel blogs and review entries about Catalonia and its sub-regional brands. Our results show relative image congruency at regional level, but significant image gaps at sub-regional levels, indicating the need for coordinated image policies at different geographical levels.

**Keywords** Official tourism websites • Projected image • User-generated content • Travel blogs and reviews • Perceived image • Catalonia

## 1 Introduction

Research on destination image has been a constant throughout the years. Destination image may be defined as the sum of beliefs, ideas, and impressions that a person has of a particular place (Crompton, 1979). Destination images are complex constructs understood from two perspectives: the projected image, formed through several information sources including destination management organizations (DMO) and the tourist industry, and the image perceived by the tourist, generated from the information received through indirect sources and his/her own tourist experience at destination level (Gartner, 1994; Kim & Lehto, 2013; Marine-Roig, 2015).

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Most authors agree as to the importance of the Internet as an information source when planning a trip, taking tourism decisions and forming images (Bastida & Huan, 2014; Choi, Lehto, & Morrison, 2007; Fernández-Cavia, Rovira, Díaz-Luque, & Cavaller, 2014; Kim & Lehto, 2013; Rodríguez-Molina, Frías-Jamilena, & Castañeda-García, 2015). For instance, the Eurobarometer (2015) survey on the preferences of Europeans towards tourism indicates that the most important information source for taking decisions about travel plans (54 %) are online sources (46 % Internet websites and 8 % social media).

In this context, increasing interest is being given to the different online images provided by users, or user-generated content (UGC), and how different they are from the ones produced by DMOs (Bandyopadhyay & Morais, 2005). Indeed, the goal of DMOs, insofar as possible, is to match the projected and perceived images of the destination (Mackay & Fesenmaier, 1997), and UGC offers an open window to tourists' perceived images, as represented during a post-trip phase.

However, even though studies emphasize the need to assess both images at the same time (Mercille, 2005), still little research has been conducted to analyse the image held by tourists and by DMOs simultaneously (Chen, Yung, & Wang, 2008). In fact, in the context of the Internet there is a need to study the image present in UGC sources and compare it to the official image in order to identify gaps and ways to improve brand image. Although some studies have been conducted comparing official tourism websites (OTWs) and UGC (Chen et al., 2008; Choi et al., 2007), no studies have compared and analysed online destination image gaps at different geographical levels at the same time, which is necessary to assess brand strategies at national and sub-regional levels (Crompton, 1979). Moreover, destination websites have usually been analysed in terms of effectiveness, usefulness, design, and information and website quality (Bastida & Huan, 2014; Fernández-Cavia et al., 2014; Rodríguez-Molina et al., 2015), but not so often in terms of the image they contain, although brand-related content on a destination website is one of the key aspects for web quality (Fernández-Cavia et al., 2014). Finally, much effort has been made to analyse the content of OTWs from a qualitative discourse analysis perspective, but quantitative studies of massive data sets are lacking (However, see, Kim & Lehto, 2013).

Therefore the aim of this study is to analyse and compare destination image on OTWs and from UGC sources, travel blogs and reviews (TBRs), in order to assess image congruency and identify image gaps at different geographical brand levels at the same time. Moreover, we aim to conduct this study from a quantitative perspective, and to target functional elements (attraction factors) and geographical elements of image through a massive computerized semi-automatic content analysis of OTW pages and more than 45,000 TBR entries of Catalonia and its sub-regional brands.

## 2 Background: Representative Dissonance and Image Congruency

Gartner (1994) suggested a model of image-formation where a continuum of different agents or information sources acts independently to form one single image in the mind of people. These range from the least credible to tourists, or the most highly destination-controlled (e.g. traditional DMO), to the organic most independent, influential and credible sources proceeding from friends and relatives through word-of-mouth. Today, with the irruption of the Internet, image formation agents have multiplied and parallels can be drawn between traditional forms of information and OTWs or between organic sources and e-WOM or UGC (Marine-Roig, 2015).

The issue of the dissonance of the representations of a destination proceeding from different agents or information sources, and how far they are from the “reality” of destinations has been addressed by Bandyopadhyay and Morais (2005). In this respect, some authors contend that there are external or foreign agents who project the images which are farther from reality and that there are local agents, especially local governments and the local community, who project images that are closer to reality (Mackay & Fesenmaier, 1997). Moreover, the farther tourists’ reside from the destination, the more favourable the image seems to be (Crompton, 1979). Whatever the case, beyond the characteristics, size, accessibility, popularity or reputation of each destination, the contents of a territory’s tourist communication strategies are usually conceived as its legitimate representation (Anton Clavé, 2010).

Today, one of the most important tools that destinations have to disseminate or project their image is OTWs. In spite of Gartner’s (1994) classification of traditional forms of advertising as being the least credible and influential, several authors defend the importance, potentialities and increasing popularity of destination websites in tourists’ choice of destination, asserting that it is websites that officially represent the cities that have the greatest impact on visitors (Bastida & Huan, 2014) or that they can change destination images (Dragova, Petrovskaya, & Egger, 2014).

However, the efforts put into building OTWs and projecting certain destination images should be assessed through comparison with tourists’ actual perceived images of as the valid significance of a brand is that registered by its public (Fernández-Cavia & Huertas-Roig, 2009). Indeed, the goal of marketers is to match to the greatest extent possible the projected and perceived image of the destination, and it is assumed that the greater the congruency, the better (Crompton, 1979; Mackay & Fesenmaier, 1997). In terms of branding, to maintain a brand-consumer relationship it is imperative that the projected brand image and the brand perception should be aligned in harmony (Kim & Lehto, 2013). However, conversely, Moura, Gnoth, and Deans (2014) found that the depiction of incongruent cultural values to a target audience on destination websites generates a more

positive destination image and greater willingness to travel, contradicting the current localization literature.

In general, although Perry (1978) found that image projected by travel agents was similar to that perceived by travellers, as Choi et al. (2007) and Andreu, Bigne, and Cooper (2001) explain, the literature shows that the images perceived by tourists seldom coincide with the images projected by suppliers because of various factors involved in image formation.

In fact, the term “congruency” between perceived and projected images is coined to measure the gap between the two types of image. Addressing and minimizing image gaps becomes crucial for destinations (Dinnie, 2008) as the existing perception gap can affect not only culture but also the economy and foreign investment in the destination, and may affect the destination’s capacity to attract more visitors (Bui, 2011). In this respect some notable studies have been conducted comparing projected and perceived images. Mercille’s (2005) compared the images of Tibet within mass media artefacts (such as movies, books and magazines) to which tourists had been exposed with their actual perceived images and identified several perception gaps (Mercille, 2005). Andreu et al. (2001) shed light on the issue by analysing the relationship between the perceived and projected image of Spain in the British market. What the authors note is that a gap exists between the two images. The information the consumer receives tends to be limited and simplified by stereotypes and also by the influence of sources of information that cannot be controlled by those who are responsible for the marketing of the destination. Bui (2011) measures the level of congruence between destination image projected by the tourism public sector and the image perceived by international tourists.

In an online environment, Krizman and Belullo (2007) aimed to identify the image representations of Istria as a tourism destination on the Internet, and understand the importance of the Internet as an agent creating tourism destination image. Choi et al. (2007) identified the image representations of Macau on the Internet by analysing the contents of a variety of web information sources, including OTWs and the perceived image as represented by users in travel blogs. Their analysis identified both attraction factors and most frequent destinations, but only through the most frequent words, and in the case of photographs, 11 sub-categories were used related to attraction factors (e.g. historic buildings and heritage). As the authors explained, the bloggers’ viewpoints, to some extent, represented the perceived image of the targeted travelling public, while the travel trade’s choices of words and visuals reflected the projected or intended images of Macau.

Chen et al. (2008) study precisely the image perception gaps between tourist blogs and travel information by comparing their contents and developing two matrices of image perception gaps of Kaohsiung City (Taiwan). Kim and Lehto (2013) compared projected and perceived destination brand personalities in the case of South Korea, and used OTWs to assess the projected image, and a survey on travellers to assess the perceived image.

In short, all online studies on image congruency between OTWs and UGC found significant dissonances, indicating several image gaps. In this context, and aware of

the growing influence of e-WOM and UGC over tourism decision-making and destination image formation (Leung, Law, van Hoof, & Buhalis, 2013; Litvin, Goldsmith, & Pan, 2008), it is imperative for DMOs to know exactly what is said by social media and users about a destination, such as in blogs and reviews, and how this differs from what the destination (DMOs or OTWs) says or would like others to say about it. This is of crucial importance not just for policy making but also for the impact it may have on destinations. Govers (2010) suggests the need for destinations to adopt “gap bridging” policies, and in this respect, quantitative computerized analyses that are capable of scrutinizing and comparing the massive quantities of UGC and DMO information online could be of help to manage destination image gaps and adopt corresponding policies.

### 3 Case Study

Catalonia and its sub-regional brands were selected as the case study region. Catalonia is the third European region as regards bed nights (Eurostat, 2014). It welcomed more than 20 million tourists in 2013, three-quarters of whom came from abroad. Its territory is divided into 9 tourist brands, which aim to delimit regions with relatively homogeneous tourist supply (Fig. 1). Besides, while studies on image representations that analyse OTWs and travel blogs and/or reviews at the same time have focused on cities (Chen et al., 2008; Choi et al., 2007), regions (Krizman & Belullo, 2007), and countries (Kim & Lehto, 2013), no studies have been found which analyse the same region at different geographical levels (the whole region of Catalonia and its sub-regional brands) as proposed in this research.



**Fig. 1** Tourist regions of Catalonia on 2015-01-01. Source: Authors, taken from the Catalan Tourist Board (<http://www.act.cat/?lang=en>)

## 4 Methodology

The methodology used for the analysis of OTWs and TBRs follows the steps proposed by Marine-Roig and Anton Clavé (2015a) consisting of semi-automatic downloading, arranging, cleaning, debugging and analysis of large scale online UGC and official data.

The first step was to select the TBR websites and the OTWs for analysis. TBR webhosts were selected with the criterion that they should have at least 100 entries about the case study, Catalonia, and then, a ranking was built by applying the weighted formula “ $TBRH = 1*B(V) + 1*B(P) + 2*B(S)$ ” (Marine-Roig, 2014), where ‘B’ refers to Borda’s ordering method, ‘V’ to website visibility (quantity and quality of inbound links), ‘P’, to popularity (received visits and traffic in general), and ‘S’, to size (number of entries related to the case study), and then the first four in the rank were selected (Table 1) which resulted in TripAdvisor (TA), VirtualTourist (VT), TravelBlog (TB), and TravelPod (TP). Then the OTWs of Catalonia and its sub-regional brands were selected (Table 2).

As observed in Tables 1 and 2, TBR websites are far more visible and popular online than OTWs and thus have a greater potential to disseminate their image.

The second step of the methodology consists of *Data downloading*. In the case of TBRs, the websites were manually browsed to identify the initial pages containing hyperlinks which lead to the individual blogs and OTR pages about the case study, and their complete URLs were saved. Then, applying filters specific (Marine-Roig & Anton Clavé, 2015b) to each website (TA, TB, TP, VT) we proceeded with the massive downloading of the HTML pages of each website through the free programme HTTrack Website Copier ([www.httrack.com](http://www.httrack.com)). All TBRs concerning Catalonia in 2014 were downloaded. In the case of OTWs the process was the same, but the official websites of Catalonia and the sub-regional brands were downloaded on 2015-01-01 in their entirety and only the part of Spanish website (Spain.info) corresponding to Catalonia.

The third step of the methodology consisted of *Data arrangement*. The TBR files were arranged into a structure of folders and files facilitating multiple

**Table 1** Webometrics of the top four websites hosting travel diaries (2015-07-01)

		TA	TB	TP	VT
Indexed pages	Google.com	150,000,000	451,000	323,000	544,000
	Bing.com	38,700,000	111,000	292,000	992,000
Link-based rank	Google PR	7	6	6	7
	Yandex CY	1900	120	375	350
Visit-based rank	Compete.com	45	32,996	19,222	2225
	Quantcast.com	111	452,622	8258	3371
	Alexa.com	187	43,709	31,342	5000
Size	Entries	46,073	146	218	154
TBRH	Rank	1	3	4	2

Source: Authors, taken from the mentioned websites

**Table 2** Indexed pages of official websites in multilingual search engines

Domain name (2015-08-03)	Brand	Bing	Google	Yandex
BarcelonaTurisme.com	Barna	60,500	145,000	9000
BarcelonaEsMoltMes.cat	cBarc pBarc	2460	15,700	227
Catalunya.com	Catalonia	97,600	273,000	3000
CostaBrava.org	cBrav	61,600	38,000	7000
CostaDaurada.info	cDaur	9120	442	351
LleidaTur.com	tLlei	25,400	41,400	430
Spain.info	Spain	317,000	151,000	17,000
TerresDeLEbre.travel	tEbre	26,600	30,100	162
VisitPirineus.com	Pyren	3170	4780	275
VisitValDAran.com	vAran	8230	19,500	818

Source: Authors, taken from Bing.com, Google.com and Yandex.com (site:DomainName)

classifications: root\website\brand\destination\date\_lang\_pagename\_[theme].htm. Data were classified according to geography, time, theme, and language (see Marine-Roig & Anton Clavé, 2015b). In the case of OTWs, files were classified into root\website\brand\destination\ and only the English section of the website was considered.

The fourth step of the methodology is *Data cleaning*. This process consisted of eliminating all the noise around the content of interest, which is what is written and posted by the tourist, in the case of TBRs, and the content of communication in OTWs. Therefore, given that the webpages of each site have a homogeneous structure and codification, elements not to be used in content analysis were deleted: comment, form, iframe, meta tag, and script; and superfluous elements such as menus, repetitive headers and footers of the site. The original HTML format was preserved in order to be able to weight keywords and key phrases according to their potential impact (Marine-Roig & Anton Clavé, 2015a).

The fifth step, *Data debugging*, was only conducted in the case of TBRs. This consisted of detecting the most common mistakes, especially proper nouns, and amending them.

The sixth step is *Content analysis* itself. This was conducted through the Site Content Analyzer programme, which measures the frequency, density and weight of keywords. Subsequently, content categories were built in this case to analyse some functional image components of the destination, consisting of attraction factors, and the geographical dimension of image. The categories concerning attraction factors were created based on previous work (Dragova et al., 2014; Echtner & Ritchie, 2003) and were extended by the most frequent keywords in the analysed webpages, and finally consisted of 8 mutually exclusive categories: (1) Food and Wine, (2) Intangible Heritage, (3) Leisure and recreational activities, (4) Nature and active tourism, (5) Sports, (6) Sun, Sea, Sand, (7) Tangible Heritage, and (8) Urban Environment. Then the most significant keywords were grouped into these categories. Moreover, a geographical category was built consisting of all the

names of the sub-regional brands, counties, cities, small towns/villages and residential areas.

## 5 Results

### 5.1 Geographical Dimension

The mentions of the different destinations within each sub-regional brand, both in the case of OTWs and TBRs, were considered. In this respect significant dissonance is observed between both images. In terms of site-wide density, while in the case of TBRs the most mentioned destination and brand is by far Barcelona, followed at a great distance by Costa Daurada and Costa Barcelona, this is not the case of OTWs which more often mention destinations in Costa Brava or Pyrenees. Moreover, while OTWs seem to mention all destinations more or less equally (within a difference of less than a factor of 10), in the case of TBRs, the mentions are very much centred on a specific popular destination with differences superior to the order of  $10^3$  if compared to the other brand regions. The territorial distribution of contents in the case of TBRs is far more unequal than in OTWs. This means that apart from the major destination (Barcelona), the rest of territories and destinations are invisible to or not worth mentioning by tourists, which indicates a major image gap.

In terms of weight, we observe that in all cases the weight of the words related to destinations in the case of TBRs is superior to that of OTWs, meaning these names appear in much more prominent html positions such as the entry title (Table 3).

**Table 3** Geographic dimension: regional brand presence

Brand	Official tourism website pages			Travel blog and review entries in 2014			
	Count	Sitewide density	Average weight	Files	Count	Sitewide density	Average weight
Barna	12,491	1.0467 %	26.24	40,156	91,359	2.8612 %	66.97
cBarc	6882	0.5767 %	5.70	731	1638	0.0513 %	65.18
cBrav	29,428	2.4659 %	32.86	1907	5281	0.1654 %	55.28
cDaur	8379	0.7021 %	11.09	3067	5715	0.1790 %	71.08
pBarc	5232	0.4384 %	14.34	512	5476	0.1715 %	57.62
Pyren	14,624	1.2254 %	17.57	143	548	0.0172 %	40.80
tEbre	8403	0.7041 %	28.90	22	145	0.0045 %	43.73
tLlei	8309	0.6963 %	8.86	36	122	0.0038 %	43.85
vAran	1658	0.1389 %	9.20	2	17	0.0005 %	32.94



## 5.2 Attraction Factors

At the general level of Catalonia, in terms of the attraction factor categories that are most mentioned by both types of sources, we can see some parallels in terms of site-wide density in most cases: Food and Wine, Intangible Heritage, Leisure and recreation activities, Sports, Tangible Heritage and Urban environment have similar densities and are therefore mentioned in a similar proportion across the files. This shows a generally congruent view of the region. However, in some cases there are some notable differences in terms of mentions: In the case of Nature and active tourism especially, but also in the case of the Sun, Sea, Sand, which are far more mentioned in the case of OTWs than in the case of tourists, indicating image incongruity in these factors that can either show that some attractions are unknown (most probably in the case of Nature and active tourism) or that they are not considered worth mentioning (which could be the case of Sun, Sea and Sand). In terms of weight, again in general TBRs use attraction factor-related words in the most prominent and visible places when posting contents. This is not the case, however, of Food and Wine, which is mentioned more prominently in the case of OTWs.

In terms of the comparison between OTWs and TBRs by sub-regional brands, in the case of Barcelona, remarkably the three densest categories coincide in both types of websites in the same order (Tangible Heritage, Urban Environment and Food and Wine), three elements that are strongly attached to the image of this capital city. However, in the case of OTWs these elements are about twice as dense, indicating strong brand image projection and a relatively coincident, but less intense, perceived image of these elements (Table 4).

In the case of Costa Brava and Costa Daurada, two coastal brands, it is observed that all the different factors are promoted in a similar proportion in the case of OTWs, with Tangible Heritage being the most prominent, followed by Sun, Sea, Sand and Nature and active tourism. Although in the case of TBRs in Costa Brava

**Table 4** Comparison of attraction factor categories in Catalonia

Categories	Official tourism website pages			Travel blog and review entries		
	Count	Sitewide density	Average weight	Count	Sitewide density	Average weight
Food and wine	12,272	1.0283 %	24.09	24,068	0.7538 %	18.47
Intangible heritage	2361	0.1978 %	17.82	4167	0.1305 %	36.03
Leisure and recreational activities	10,028	0.8403 %	19.12	28,044	0.8783 %	31.48
Nature and active tourism	23,842	1.9978 %	10.68	10,556	0.3306 %	17.32
Sports	4835	0.4052 %	25.52	11,121	0.3483 %	37.16
Sun, sea, sand	13,641	1.1430 %	13.85	16,713	0.5234 %	27.20
Tangible heritage	60,037	5.0308 %	18.26	145,782	4.5656 %	37.23
Urban environment	13,330	1.1170 %	10.36	55,221	1.7294 %	37.43

the two most prominent elements coincide, the third element, Nature and active tourism, is one of the least mentioned, highlighting an image gap concerning this element. Yet more remarkable is the gap in the case of Costa Daurada, where the most prominent elements are not coincident. In Costa Daurada's TBRs, the densest element by far is Leisure and recreational activities. This can be explained because the words related to "Theme Parks" are very prominent, especially related to one specific theme park in the area (PortAventura). However, in OTWs this is not one of the densest elements. Sun, Sea, Sand coincides in second place in both types of websites, and Tangible Heritage only comes third. In the case of Costa Daurada, there is an important image gap, as for tourists, Leisure and recreational activities is the most central and differential element of the brand, while for OTWs this element is not emphasized.

In the case of the Pyrenees the brand image seems to be more congruent as in both cases Nature and active tourism is seen as the most prominent element in both OTWs and TBRs. Then, Tangible Heritage is also prominent in both cases in second (OTWs) and third (TBRs) position. However, in the case of the Pyrenees, there is a strong density of Intangible Heritage (including traditions and folklore) which is not emphasized in the case of OTWs. It is remarkable, therefore, that in this case tourists mention this Intangible Heritage far more than the OTWs in charge of promoting it.

Finally, in the case of Costa Barcelona and Paisatges Barcelona, OTWs most strongly mention Nature and active tourism, secondly Tangible Heritage and then Sun, Sea, Sand, and Food and Wine. In the case of TBRs, both brands are seen very differently. In the case of Costa Barcelona, more similarly to OTWs, the most prominent elements are Sun, Sea and Sand, Tangible Heritage, and Food and Wine. However, Nature and active tourism is mentioned very weakly in this case. Besides, in the case of Paisatges Barcelona the most prominent element is Tangible Heritage, followed by Nature and active tourism, which coincides with the two most prominent elements in the case of OTWs. Therefore, in this case, if we account for both brands we can see significant image congruency between OTWs and TBRs. However, in the case of Paisatges Barcelona, Urban Environment is also remarkably dense, probably due to its proximity to Barcelona (Tables 5 and 6).

**Table 5** OTWs site-wide density of attraction factor categories per brands

OTWs	Barna	cBrav	cDaur	Pyren	cBarc + pBarc
Food and wine	1.481 %	1.301 %	1.977 %	0.692 %	1.628 %
Intangible heritage	0.107 %	0.210 %	0.122 %	0.393 %	0.275 %
Leisure and recreational activities	0.694 %	1.066 %	1.381 %	0.453 %	0.765 %
Nature and active tourism	0.616 %	2.016 %	2.086 %	4.522 %	4.030 %
Sports	0.882 %	0.298 %	0.486 %	0.454 %	0.424 %
Sun, sea, sand	0.701 %	2.034 %	2.252 %	0.352 %	1.687 %
Tangible heritage	8.496 %	3.130 %	2.970 %	2.829 %	3.328 %
Urban environment	2.334 %	0.718 %	0.454 %	0.388 %	0.644 %

**Table 6** TBRs site-wide density of attraction factor categories per brands

TBRs	Barna	cBrav	cDaur	pyren	cBarc	pBarc
Food and wine	0.796 %	0.430 %	0.342 %	0.405 %	1.583 %	0.457 %
Intangible heritage	0.118 %	0.025 %	0.220 %	2.080 %	0.097 %	0.019 %
Leisure and recreational activities	0.739 %	1.034 %	2.612 %	0.215 %	1.371 %	0.425 %
Nature and active tourism	0.266 %	0.748 %	0.145 %	3.225 %	0.253 %	1.886 %
Sports	0.395 %	0.098 %	0.050 %	0.150 %	0.318 %	0.026 %
Sun, sea, sand	0.334 %	2.287 %	1.296 %	0.190 %	2.271 %	0.094 %
Tangible heritage	4.908 %	5.160 %	0.911 %	1.415 %	1.589 %	5.562 %
Urban environment	1.892 %	1.104 %	0.682 %	0.870 %	0.724 %	1.356 %

## 6 Concluding Remarks

Destination image gaps seem to be a constant in both online and offline studies between official images and tourists' images, including the present study. However, this research contributes to this perspective differently. On the one hand, this study identifies destination image gaps in terms of territorial representation and perception, which had not been previously identified. Our results show that OTWs represent all territories more or less equally but tourists represent or perceive only very specific locations and regions, rendering most of the territory invisible in UGC and showing a great territorial disequilibrium in perceived image. On the other hand, in terms of attraction factors this research finds that image congruency may be different at different geographical levels as it identifies that the distribution of attraction in images is highly congruent between UGC and OTWs on a general level, but not at sub-regional level. Significant image gaps are observed in some sub-regional brands, especially as tourists reinforce leisure and intangible heritage aspects that OTWs do not emphasize.

This indicates that image gaps should be studied carefully at different geographical levels to obtain an idea of the general picture, and that general image congruency does not mean that this image is congruent at all geographical levels or that the intensity of place brand representation is similarly distributed in official and tourist images. This aspect reinforces the idea of Crompton (1979) to combine general marketing strategies with specific regional strategies and emphasizes that regional DMOs should also address the issue of territorial perception distribution which may affect tourist flows to the different regions. Therefore, ever more complex destinations with multiple administrations and brand architecture strategies should study the concept of gap bridging (Govers, 2010) within and across several geographical levels in the online domain.

This idea is crucial as image gaps are increasingly important for DMOs since, on the one hand, UGC images are highly influential on other users (Leung et al., 2013; Litvin et al., 2008) and, at least in this case study, are far more visible and popular than OTWs as the webometrics indicate, and therefore have a greater capacity to disseminate their image. This poses an enormous challenge to destination managers

who should consider it carefully and should adopt measures to regularly analyse and address it. In this respect, the method used in this study proved to be useful to analyse massive quantities of online information by using comparable categories that were applied at different geographical brand levels, and could be helpful for destinations to regularly analyse destination image gaps at different levels or assess specific marketing campaigns.

Limitations to this study are that data were analysed in a specific period of time and on specific geographical levels. Future research could consider the keywords in the context of the sentence in which they appear. More research could also show an overview of congruence between projected image in OTWs and perceived image in TBRs using a statistical test in which the density and weight of the keyword categories are compared.

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## References

- Andreu, L., Bigne, J. E., & Cooper, C. (2001). Projected and perceived image of Spain as a tourist destination for British travellers. *Journal of Travel and Tourism Marketing*, 9(4), 47–67.
- Anton Clavé, S. (2010). Identity and tourism. Between image and perception. *Paradigms*, 5, 156–165.
- Bandyopadhyay, R., & Morais, D. (2005). Representative dissonance: India's Self and Western image. *Annals of Tourism Research*, 32(4), 1006–1021.
- Bastida, U., & Huan, T. C. (2014). Performance evaluation of tourism websites' information quality of four global destination brands: Beijing, Hong Kong, Shanghai, and Taipei. *Journal of Business Research*, 67(2), 167–170.
- Bui, T. L. H. (2011). Congruency between the projected and perceived destination image of Vietnam. *Journal of International Business Research*, 10(2), 1–13.
- Chen, H. J., Yung, C. Y., & Wang, M. H. (2008). Perception gaps between tourist blogs and travel information on destination image. *26th EuroCHRIE Conference*, Oct. 12–14, Dubai.
- Choi, S., Lehto, X. Y., & Morrison, A. M. (2007). Destination image representation on the web: Content analysis of Macau travel related websites. *Tourism Management*, 28(1), 118–129.
- Crompton, J. L. (1979). An assessment of the image of the Mexico as a vacation destination and the influence of geographical location upon the image. *Journal of Travel Research*, 17(4), 18–23.
- Dinnie, K. (2008). *Nation branding: Concepts, issues, practice*. Oxford: Butterworth-Heinemann.
- Dragova, S., Petrovskaya, K., & Egger, R. (2014). Measuring the perceived image of Lithuania through its destination management organization website. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 679–691). Cham, Switzerland: Springer. doi:10.1007/978-3-319-03973-2\_49.
- Echtner, C. M., & Ritchie, J. R. B. (2003). The meaning and measurement of destination image. *Journal of Tourism Studies*, 14(1), 37–48.
- Eurobarometer. (2015). *Flash Eurobarometer 414: Preferences of Europeans towards tourism*. Brussels, Belgium: European Commission.
- Eurostat. (2014). Tourism. In *Eurostat regional yearbook 2014* (pp. 187–210). Luxembourg: Publications Office of the European Union.

- Fernández-Cavia, J., & Huertas-Roig, A. (2009). City brands and their communication through Web sites: Identification of problems and proposals for improvement. In M. Gasco-Hernandez & T. Torres-Coronas (Eds.), *Information communication technologies and city marketing: Digital opportunities for cities around the world* (pp. 26–49). Hershey, EEUU: Idea Group Inc.
- Fernández-Cavia, J., Rovira, C., Díaz-Luque, P., & Cavaller, C. (2014). Web Quality Index (WQI) for official tourist destination websites. Proposal for an assessment system. *Tourism Management Perspectives*, 9, 5–13.
- Gartner, W. C. (1994). Image formation process. *Journal of Travel and Tourism Marketing*, 2(2-3), 191–216.
- Govers, R. (2010). Destination eBrands. *17th International Conference on Information Technology and Travel & Tourism*. Lugano: ENTER 2010.
- Kim, S., & Lehto, X. Y. (2013). Projected and perceived destination brand personalities: The case of South Korea. *Journal of Travel Research*, 52(1), 117–130.
- Krizman, D. & Belullo, A. (2007). Internet – An agent of Tourism destination image formation: Content and correspondence analysis of Istria travel related websites. *4th International Conference: Global Challenges for Competitiveness: Business and Government Perspective* (pp. 541–556). Pula: Juraj Dobrila University of Pula, Department of Economics and Tourism.
- Leung, D., Law, R., van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel and Tourism Marketing*, 30(1-2), 3–22.
- Litvin, S. W., Goldsmith, R. E., & Pan, B. (2008). Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*, 29(3), 458–468.
- Mackay, K. J., & Fesenmaier, D. R. (1997). Pictorial element of destination in image formation. *Annals of Tourism Research*, 24(3), 537–565.
- Marine-Roig, E. (2014). A webometric analysis of travel blogs and reviews hosting: The case of Catalonia. *Journal of Travel and Tourism Marketing*, 31(3), 381–396. doi:[10.1080/10548408.2013.877413](https://doi.org/10.1080/10548408.2013.877413).
- Marine-Roig, E. (2015). Identity and authenticity in destination image construction. *Anatolia – An International Journal of Tourism and Hospitality Research*, 26(4), 574–587. doi:[10.1080/13032917.2015.1040814](https://doi.org/10.1080/13032917.2015.1040814).
- Marine-Roig, E., & Anton Clavé, S. (2015a). A method for analysing large-scale UGC data for tourism: Application to the case of Catalonia. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism* (pp. 3–17). Cham, Switzerland: Springer. doi:[10.1007/978-3-319-14343-9\\_1](https://doi.org/10.1007/978-3-319-14343-9_1).
- Marine-Roig, E. & Anton Clavé, S. (2015b). Tourism analytics with massive user-generated content: A case study of Barcelona. *Journal of Destination Marketing and Management*. doi:[10.1016/j.jdmm.2015.06.004](https://doi.org/10.1016/j.jdmm.2015.06.004).
- Mercille, J. (2005). Media effects on image: The case of Tibet. *Annals of Tourism Research*, 32(4), 1039–1055.
- Moura, F., Gnoth, J., & Deans, K. R. (2014). Localizing cultural values on tourism destination websites: The effects on users' willingness to travel and destination image. *Journal of Travel Research*, 54(4), 528–542.
- Perry, M. (1978). Comparison of tourist destinations image as perceived by travellers and travel agents. *Journal of the School of Business Administration*, 1(3).
- Rodríguez-Molina, M. A., Frias-Jamilena, D. M., & Castañeda-García, J. A. (2015). The contribution of website design to the generation of tourist destination image: The moderating effect of involvement. *Tourism Management*, 47, 303–317.

# Do Social Media Investments Pay Off?: Preliminary Evidence from Swiss Destination Marketing Organizations

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**Abstract** Social media has become a dominant subject in tourism and hospitality research. Given the importance of social media in the customer journey, destination marketing organizations (DMOs) need to understand the effectiveness of their social media activities. This paper analyses the relationship between DMOs' marketing spending and staffing and various social media key performance indicators (KPIs). We used an online questionnaire to collect data about social media activities and respective marketing budgets of DMOs in Switzerland for the reference year 2014. We also gathered social media KPI figures of the five main social media platforms used by these DMOs (i.e. Facebook, Twitter, Google+, YouTube, and Instagram). Our results suggest that DMOs' investments in social media (allocated resources for marketing, online marketing, and especially social media) correlate with identified metrics for measuring social media success.

**Keywords** Social media • Key performance indicators • Social media effectiveness • DMO • Destination marketing organization, tourism

## 1 Introduction

As of 2015, tourism organizations can choose from a rich arsenal of instruments to reach, communicate, and engage with (potential) customers. Marketers can distinguish between paid (e.g. display or search advertising), owned (e.g. corporate website or email newsletters), and earned media (e.g. word-of-mouth, buzz, or “viral” user-generated content) (Corcoran, 2009). Social media are platforms for

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earned media, but can also be used as owned media (Corcoran, 2009). As a result, social media platforms (e.g. Facebook, Twitter, YouTube, Google+, Instagram, or Pinterest) also become marketing communications instruments or channels, respectively. Together with other instruments, they need to be well integrated into the business strategy in order to be effective, as they fulfil other functions than traditional advertising such as interaction with the customer and engagement (Minazzi, 2014).

The successful management of any type of media and instrument requires the measurement of its effectiveness in order to be able to evaluate success and to further improve. The lack of research on measuring the success of organizations' social media activities is in sharp contrast to the extensive use of social media by consumers and organizations' efforts to effectively leverage this channel. As Fisher (2009) puts it, "Return on Investment (ROI) has become the Holy Grail of social media" (p. 189). Given the importance of social media for inspiring potential visitors (Leung, Law, van Hoof, & Buhalis, 2013), destination marketing organizations (DMOs) need to understand how their social media efforts take effect. Thus, this paper analyses the relationship between DMOs' marketing spending and staffing and various social media key performance indicators (KPIs).

## 2 Literature Review

### 2.1 *Today's Social Media Landscape*

Social media can be defined 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" (Kaplan & Haenlein, 2010, p. 61). User-generated Content (UGC) comprises a variety of different types of content (e.g. text, pictures, audio, and video) that (a) is published in some context, (b) arises from a certain amount of creative effort, and (c) is created outside professional routines and practices (OECD, 2007). Well known types of social media are microblogs, social network sites, and content communities (Boyd & Ellison, 2008; Kaplan & Haenlein, 2010, 2011a). In terms of active users, Twitter, Facebook, and YouTube are the most prominent representatives of the respective types. The microblogging service Twitter currently counts around 300 million monthly active users (about.twitter.com/company [July 6, 2015]). The social network site Facebook currently counts around 940 million daily active users and 1.44 billion monthly active users (newsroom.fb.com/company-info/ [July 6, 2015]). And the content community YouTube counts more than 1 billion users ([www.youtube.com/yt/press/statistics.html](http://www.youtube.com/yt/press/statistics.html) [July 6, 2015]).

In order to compete with established social media platforms such as Twitter and Facebook, the owner of YouTube, Google, launched its own social network site named Google+ in June 2011 (Gundotra, 2011; Magno, Comarela, Saez-Trumper,

Cha, & Almeida, 2012). As part of the Google ecosystem, a Google+ profile had been created automatically for about 4 years when people signed up with any service of Google (Denning, 2015). A recent study found “90 % of people who have created Google+ profiles have never posted *publicly* [emphasis added]” (Enge, 2015). However, other sources suggest Google+ currently has 343 million monthly active users (We Are Social, 2015) indicating the importance of the channel.

The how, when, and where people use the Internet and social media platforms has irreversibly changed with the increasing penetration of highly capable smartphones along with mobile broadband (e.g. 4G/LTE) and affordable data packages. The mobilization of the Internet (e.g. Dischler, 2015; Meeker, 2015) has motivated new players to enter the social media landscape, e.g. Instagram—a mobile app and online platform for capturing and manipulating photos and videos for subsequent sharing with other Instagram users or via other social media platforms (e.g. Twitter or Facebook). As of July 2015, Instagram reports to have 300 million active users with more than 70 % of them outside the U.S., more than 30 billion shared photos, and 70 million new photos per day (instagram.com/press/ [July 6, 2015]). This makes Instagram as widely used as Twitter. While Instagram focuses on the original creation of content, Pinterest is about the curation of content previously created by others (Hall & Zarro, 2012). Pinterest allows its users to organize photos and videos into topical themes; each piece of content is “pinned” to a virtual pin board (Gilbert, Bakhshi, Chang, & Terveen, 2013). Similar to other social media platforms, Pinterest users can follow each other, “re-pin”, “like”, and comment on other pieces of content (Gilbert et al., 2013; Hall & Zarro, 2012). As of March 2015, Pinterest is reported to have more than 70 million monthly active users with almost 40 % of them outside the US (mashable.com/2015/04/29/pinterest-evan-sharp-users/ [July 6, 2015]).

## ***2.2 The Role of Social Media in Tourism as a Marketing Instrument***

Social media has become a dominant subject in tourism and hospitality research (Leung et al., 2013; Pourfakhimi & Ying, 2015; Xiang & Gretzel, 2010; Zeng & Gerritsen, 2014). Demand-side studies on social media in tourism have analysed the role, use, and impact of social media in all travel phases, i.e. in the pre-travel, on-site, and post-travel phases (Leung et al., 2013; Zeng & Gerritsen, 2014). Most of that research has focused on the pre-travel phase, in particular on the information search process (Leung et al., 2013). This due to the potential of UGC to multiply the effect of traditional word-of-mouth (WOM) (Kaplan & Haenlein, 2011b; Leung et al., 2013; Zeng & Gerritsen, 2014). WOM is generally defined as “informal communications directed at other consumers about the ownership, usage, or characteristics of particular goods and services and/or their sellers” (Westbrook, 1987, p. 261). The non-commercial and experiential nature of electronic WOM make it a



credible and rich information source in tourists' information search process (Leung et al., 2013; Litvin, Goldsmith, & Pan, 2008).

Supply-side studies on social media in tourism have focussed on the use of social media in promotion, management, and research (Leung et al., 2013). For example, in a benchmark study on the level of implementation of ICT in destinations, Buhalis and Wagner (2013) compared to what extent DMOs use Facebook, Twitter, YouTube, Pinterest, and Flickr for engaging with (potential) visitors. However, research has not yet sufficiently covered the measurement of the effectiveness of tourism suppliers' social media activities (Leung et al., 2013). Indicative empirical evidence for the ROI of social media activities in the travel and tourism domain has been provided by Buhalis and Mamalakis (2015), based on one Greece hotel. In addition, a case study comparing SWISS and KLM in their phase of starting social media activities shed light on the staff allocated to social media activities as well as certain outcomes. KLM used much more manpower during the ash cloud crisis and therefore increased its Facebook fanbase much faster than SWISS (Caliesch & Liebrich, 2012). Further, in comparison to US DMOs, Swiss DMOs were found to lag behind in both social media adoption and social media success (Milwood, Marchiori, & Zach, 2013). Although the adoption levels varied between both countries, Facebook, Twitter, YouTube, LinkedIn, Flickr, and Google+ were found to be the most widely adopted social media platforms in both markets (Milwood et al., 2013).

As DMOs are "the main vehicle to compete and attract visitors to their distinctive place or visitor space" (Pike & Page, 2014, p. 202), empirical evidence on the effectiveness of social media activities at the destination level is highly desirable.

### **2.3 Social Media Success Measurement**

The following review of the literature reveals that measuring the effectiveness or success of organizations' social media activities is of increasing importance. The successful management of any marketing communications instrument requires the measurement of meaningful key performance indicators (KPIs) in the first place—what you cannot measure, you cannot manage. Return on investment is a widely used and accepted success metric in practice (Lenskold, 2003). Its application for measuring the success of social media has been increasingly discussed (e.g. Buhalis & Mamalakis, 2015; Hoffman & Fodor, 2010; Kaske, Kügler, & Smolnik, 2011; Kumar & Mirchandani, 2012). Several aspects of basic ROI assessments have been declared inadequate for measuring the success of social media. For example, long-term effects are often ignored, the forecasting of returns is difficult, and purely financial measures are insufficient for quantifying and justifying marketing investments (Kaske et al., 2011). In addition, the specificities of social media prohibit to simply apply success metrics such as reach from traditional mainstream media (Hoffman & Fodor, 2010; Peters, Chen, Kaplan, Ognibeni, & Pauwels, 2013). As a result, several studies have suggested to adapt the traditional ROI approach and to

redefine the ‘return’ in the social media ROI (e.g. Hoffman & Fodor, 2010; Kaske et al., 2011). In particular, Hoffman and Fodor (2010) suggested to turn the traditional ROI approach upside down “by considering consumer motivations to use social media and then measure the social media *investments* customers make as they engage with the marketers’ brands” (p. 42). These consumer investments are tied to specific social media platforms and thus materialize for instance as number of tweets, retweets, followers, and @replies on Twitter; number of fans, ‘likes’, comments, etc. on Facebook; and number of views, comments, subscribers, and others for content communities like YouTube (Hoffman & Fodor, 2010).

Beyond static metrics focusing mainly on quantity (e.g. mere number of fans or likes), engagement has become an important non-financial indicator for measuring the success of organizations’ social media efforts (Buhalis & Mamalakis, 2015; Peters et al., 2013). Although there is no uniform way of how engagement is operationalized, it is typically done by considering a weighted combination of actions (e.g. comments, shares, ‘likes’) related to a post (Buhalis & Mamalakis, 2015; Peters et al., 2013). Alternatively, individual social media metrics are related to specific user bases, e.g. number of total fans for a Facebook page (Buhalis & Mamalakis, 2015). Moreover, due to the dynamics of social media, respective metrics should be related to the temporal dimension; the growth or decline in relevant metrics may thus be a more important than their actual states (Peters et al., 2013; Tirunillai & Gerard, 2012).

Literature on social media typically refers to ‘marketing efforts’ or ‘social media marketing efforts’ when discussing investments of organizations in social media (Leung et al., 2013; Peters et al., 2013). Buhalis and Mamalakis (2015) further detail this cost side of organizations’ social media activities by distinguishing four basic categories of expenses, namely (1) staff costs, (2) external costs, (3) advertising, and (4) other costs. Another categorization of organizations’ investments in social media comprises (1) social marketing budget, (2) people and resources, and (3) technology investments (Lewis, 2012). Budget for marketing and staff are recurring topics. Sufficient qualified staff are needed to manage the immediate and multi-way nature of social media which (a) causes viral spreading of both positive and negative messages and (b) may lead to consumers’ expectations of virtually instant replies to their requests via social media (Kaplan & Haenlein, 2011b; Peters et al., 2013). In turn, this demands proactive monitoring of and short-term reactions to (un-)wanted developments in social media which can only be made possible by assigning a certain amount of employees to such activities (see also Caliesch & Liebrich, 2012).

Based on (a) the relevance of specific social media platforms (see Sect. 2.1), (b) the importance of social media for DMOs and lack of research on the effects of DMOs’ efforts on social media success (see Sect. 2.2), and (c) the identified metrics for measuring return and investment (see above), we derive the following hypotheses:

H1: There is a relationship between the (a) marketing budget, (b) the online marketing budget, (c) the social media budget, and the amount of posts on the various platforms (i.e. Facebook, Twitter, YouTube, Instagram, Google+).

Even though more social media budget makes possible more sophisticated campaigns that can lead to more posts, there is limited evidence for the positive effect of financial resources. Likewise, online and offline marketing activities can aim to drive consumers to social media. We thus test for both sides (positive and negative).

H2: There is a correlation between the (a) marketing budget, (b) the online marketing budget, (c) the social media budget, (d) the weekly hours allocated to social media, (e) the percentages of a full-time job position for social media and the website success as indicated by Alexa Traffic Rank and unique website visitors.

Regarding Alexa Traffic Rank, a lower rank is better than a higher rank (i.e. more successful). A higher number of unique website visitors typically indicates more success. Different types of budgets and resources can improve website success. Online marketing often aims at generating website traffic, and one goal of social media activities can be to generate website traffic. Social media adoption has been identified as a driver of web marketing success (Milwood et al., 2013). However, in light of limited empirical evidence, we test for both sides (positive and negative).

H3: There is a relationship between (a) the percentages of a full-time job position for social media, (b) the hours allocated to social media, and the amount of posts on the various platforms (i.e. Facebook, Twitter, YouTube, Instagram, Google+).

Considering that the viral spread of marketing messages can be a major goal of organizations' social media activities (Kaplan & Haenlein, 2011b), there could be a positive relationship. At the same time, staff may be allocated to prevent so-called shitstorms (Peters et al., 2013), i.e. to prevent a high number of (negative) posts. In light of such potentially conflicting goals, we test for both sides.

H4: There is a relationship between the (a) amount of platforms used, (b) the amount of posts on the various platforms, and the social media KPIs.

Because there is a lack of evidence regarding this relationship, we take an exploratory approach and test for both sides.

### 3 Methodology

We used two main ways of data collection. First, an online questionnaire was designed to collect data about social media usage and respective marketing budgets of DMOs in Switzerland for the reference year 2014. Second, the *Fanpage Karma* social media monitoring tool was used to gain insights into KPIs of five main social media platforms (i.e. Facebook, Twitter, Google+, YouTube, and Instagram;

Pinterest was not covered by the tool) used by the DMOs. Figure 1 summarizes the key aspects covered by each approach.

The questionnaire comprised 17 questions. Six questions were dedicated to social media platforms DMOs use. We asked for the URLs of the various channels. One question asked for the number of unique visitors on the DMO websites and another one for the percentage of website visitors generated through social media. In terms of budget, we asked for the overall marketing budget for 2014, the budget for online marketing, and the budget dedicated to social media (without costs for employees). The Alexa Rank ([www.alexa.com](http://www.alexa.com)) served as an independent external metric for website traffic. An additional question covered the specific allocation of the online marketing budget (website, SEO, SEM, etc.). In order to cover the manpower costs, we asked how many hours the DMOs spend on social media a week and the percentage of employees responsible for social media (e.g. a half-time job would be 50 %). The size of the DMOs was controlled for by the number of overnight stays in hotels and other accommodations. After pre-testing, the questionnaire was sent to 165 Swiss DMOs in March 2015 by email. The sample includes the members of the Association of Swiss Tourism Managers ([www.vstm.ch](http://www.vstm.ch)), a trade organization covering all professional tourism organizations in Switzerland.

In total, 82 KPIs were collected (23 for Facebook, 12 for Google+, 15 for Instagram, 16 for Twitter, and 16 for YouTube). Besides followers, posts, likes, comments, and shares, aspects such as engagement, growth rate, post interaction, and page performance are captured. Indicator definitions are provided in Table 1. Data represent the KPIs at the end of March 2015.

After analysing each data set individually (descriptive results), the combined analysis (using non-parametric tests) of the two data sets collected allows to get a better understanding about the relationships between the effort DMOs make in terms of budget, manpower, and posts and the outcome or success measures



Fig. 1 Summary of two-step data collection approach

Table 1 Definitions of key performance indicators

KPI	Definition
Engagement	Average of daily engagements over time. Daily amount of likes, comments, and shares divided by the number of fans.
Growth rate	Average growth of the page over time to get to the current value.
Post interaction	Average amount of all interactions per fan per post (does not take into account days without interaction).
Page performance index	Fanpage Karma’s estimates of the success of a page based on a combination of engagement and growth values (values between 0 and 100; 100 being the best).

(e.g. followers, likes, shares, comments, engagement, growth) on five main social media platforms.

## 4 Results

### 4.1 *Sample Description*

The online survey resulted in 42 usable questionnaires, which equals to a response rate of 25 %. The DMOs had 586,683 unique website visitors on average—about 20 % had below 100,000, about one third between 100,000 and 500,000, about one fourth between 500,000 and 1,000,000, and 17 % more than 1,000,000. For more than half of the DMOs (52.4 %), social media platforms generate a quite low number of website visitors. The maximum share of website traffic triggered by social media is 10–15 %; yet this is the case for less than 5 % of the DMOs. The website traffic metrics for the DMOs based on data from Alexa.com show an average Alexa Traffic Rank of 1,936,016 (median = 751,061, max = 6,303,538, min = 88,023).

### 4.2 *Marketing Budgets and Social Media Use*

In 2014, the marketing budget of DMOs in our survey ranged from CHF 10,000 to a maximum of CHF 9,000,000 (average = CHF 1,290,116). From this budget, one out of five DMOs (21.6 %) use less than CHF 20,000 for online marketing; another fifth (21.6 %) use between CHF 20,000 and 50,000, 27.0 % between CHF 50,000 and 100,000, and 29.7 % use more than CHF 100,000. So, on average, DMOs use 10.6 % (STD = 0.10) of their marketing budget for online marketing purposes. The majority of the online budget goes to the DMO website (57.1 %), followed by around 18 % for search engine marketing (SEM) and optimization (SEO). Excluding costs for manpower, 22.9 % of the DMOs spend less than CHF 1000 for social media, 40.0 % spend between CHF 1000 and 5000, 20.0 % CHF 5000 to 10,000, and 17.1 % more than CHF 10,000. This shows that on average only 1.1 % of the marketing budget is allocated to social media. See Table 2 for an overview of the marketing budget allocation; also, see the budget compared to overnight stays.

In terms of manpower, DMOs dedicate on average about one fifth (median = 12.5 %) of a full-time job position to social media (max = 1.2 positions, min = 0). This translates to an average of 9.2 h per week (median = 5.0, max = 60, min = 0 h). Given the fact that an employee in marketing without team leading responsibilities earns about CHF 80,000 per year, this means DMOs on average spend CHF 15,960 on social media manpower per year. On average, DMOs use 4.1 (STD = 1.74) different social media platforms. Two DMOs do not use social media

**Table 2** Summary of DMOs' marketing budgets (in CHF)

	Mean	Median	Min	Max
Overnight stays 2014	789,551	437,000	13,929	4,963,424
Marketing budget	1,290,116	440,000	10,000	9,000,000
Online marketing budget	133,040	50,000	1000	1,600,000
Social media budget	5785	2000	0	50,000
Share for online marketing	11 %	7 %	0 %	50 %
Share for social media marketing	1 %	0.2 %	0 %	10 %
Marketing budget/overnight stays	1.6	1.2	0.01	6.3
Online marketing/overnight stays	0.31	0.10	0.0	4.7

at all while 12 use six popular platforms (i.e. Facebook, Twitter, YouTube, Google +, Instagram, Pinterest). All DMOs using social media have a Facebook page; 85.7 % use YouTube, 81 % Twitter, 66.7 % Google+, 50.0 % Instagram, and 35.7 % Pinterest.

### 4.3 Social Media Key Performance Indicators

As two DMOs do not use social media, the following results are based on a sample of 40 DMOs. As not all DMOs are present on all social media platforms, the sample size varies depending on the social media platform. The KPIs in Table 3 show that the success of the various DMOs is actually quite limited. In fact, especially engagement and growth rates seem to be low.

### 4.4 Hypothesis Testing

A Spearman correlation analysis shows that there is no relationship between budget and the number of posts on the various platforms (H1). The only significant relationship revealed is concerning YouTube videos (marketing budget:  $r = 0.45$ ,  $p = 0.009$ ; online marketing budget:  $r = 0.32$ ,  $p = 0.068$ ; social media budget:  $r = 0.50$ ,  $p = 0.003$ ).

Results for hypothesis 2 (H2) show that there is a negative correlation between the marketing budget ( $r = -0.75$ ,  $p = 0.005$ ) and the online marketing budget ( $r = -0.58$ ,  $p < 0.001$ ) and the website success as indicated by the Alexa Traffic Rank, which was expected as the lower the Alexa rank the higher the website traffic. Similar patterns are also observed for the hours allocated to social media ( $r = -0.32$ ,  $p = 0.053$ ) and the percentages of a full-time job position ( $r = -0.50$ ,  $p = 0.002$ ). However, the correlation with the social media marketing budget ( $r = 0.69$ ,  $p < 0.001$ ) is positive indicating a negative effect of social media spending on website success. The correlations between unique website visits and

**Table 3** Summary of DMOs' social media KPIs

	Facebook (n=40)			Twitter (n=33)					
	Mean	Median	Max	Mean	Median	Max			
	19.76	16.5	48	45.97	28	168			
# posts/tweets/videos	0.71	0.59	1.71	1.64	1	6			
# posts/tweets per day	14,470.2	5,164	121,927	1,490.32	685.5	7,797			
Success measures	3,307.55	1,109.00	42,326	60.67	16	433			
Follower/fan/subscriber	73.58	34	538	0.09	0	0.88			
#Likes/favoured	255.5	76	2,551	39.97	8	225			
#shares/retweets	0.01	0.01	0.03	0.003	0.002	0.02			
Engagement	0.82%	0.49	3%	1.91%	0.90%	12.00%			
Growth rate	5.86	1.05	101.32	49.27	22	282			
Absolute Growth	0.01	0.01	0.03	0.002	0.001	3.75			
Post interaction	0.23	0.18	0.7	0.46	0.42	1			
Page performance index									
	YouTube (YT; n=36)			Instagram (n=14)			Google+ (n=28)		
	Mean	Median	Max	Mean	Median	Max	Mean	Median	Max
	31.1	17	140	12.93	12.5	36	1.44	0	13
# posts/tweets/videos	na	na	na	0.46	0.45	1.29	0.05	0	0.46
# posts/tweets per day	103.71	41	701	684.33	163	3,452	92.43	19.8	682
Success measures	161.65	43	880						
Follower/fan/subscriber	9.14	3	45						
#Likes	30.06	11	185	38.21	16	236	0.11	0	3
#Disliked	92,777.22	22,537.50	493,546	na	na	na	0.003	0.002	5
#comments	92,776.08	24,364.00	493,477	6.90%	1.39%	68%	0.05	0	1
# shares (YT=views)	0.94	0.95	1	7.85	6	28	na	na	na
Growth rate (YT=channel Views)	na	na	na	0.06	0.6	0.11	0.003	0	0.01
Abs growth (YT=Like/share)	na	na	na	0.16	0.13	0.6	0.02	0	0.01
Engagement	na	na	na	0.9	1				
Post interaction	na	na	na						
Page performance index	na	na	na						

**Table 4** Correlation between amount of posts on various platforms and KPIs

	Facebook	Twitter	YouTube	Instagram	Google+
Follower/fan/subscriber	n.s.	r = 0.39 p = 0.024	r = 0.74 p < 0.001	n.s.	n.s.
# Likes/favourited	r = 0.61 p < 0.001	r = 0.81 p < 0.001	r = 0.85 p < 0.001	r = 0.92 p < 0.001	n.a.
# comments/ conversations	r = 0.57 p < 0.001	r = 0.66 p < 0.001	r = 0.81 p < 0.001	r = 0.55 p = 0.043	n.s.
# shares/retweets	r = 0.34 p = 0.035	r = 0.83 p < 0.001	n.a.	n.a.	r = 0.63 p = 0.001
Engagement/YouTube: dislikes	r = 0.57 p < 0.001	r = 0.73 p < 0.001	r = 0.91 p < 0.001	n.s.	n.s.
Absolute growth/ YouTube:channel views	r = 0.34 p = 0.034	r = 0.43 p = 0.012	r = 0.88 p < 0.001	n.s.	n.s.
Page performance index	r = 0.36 p = 0.026	r = 0.66 p < 0.001	n.a.	r = 0.67 p = 0.009	r = 0.63 p = 0.001

Key: n.s. = results not significant; n.a. = data not available; post interaction: all correlations n.s.

marketing budget (r=0.71, p<0.001), online marketing budget (r=0.60, p<0.001), social media marketing budget (r=0.54, p=0.002), the hours allocated to social media (r=0.38, p=0.029), and the percentages of a full-time job position (r=0.40, p=0.021) all show positive results supporting the idea that online marketing and social media efforts result in website success.

Testing of hypothesis 3 (H3) suggests that manpower matters to some extent for social media success. Concerning the percentage of a full-time job position allocated to social media, the Spearman correlation coefficient is only significant for the amount of videos posted (r=0.35, p=0.037). An examination with regards to the hours spent on social media platforms does not show significant results for Twitter and Instagram, but the correlation is significant for Facebook (r=0.36, p=0.027), YouTube (r=0.43, p=0.009), and Google+(r=0.40, p=0.042). There are no significant values concerning the relationship between the amount of platforms used and social media KPIs (H4). The results concerning the amount of posts are presented in Table 4. As presented, the amount of posts is always correlated with the amount of likes/favourites and the page performance index. The amount of posts on Facebook, Twitter, and YouTube has a clear positive correlation with all the KPIs. The only exemption is post interaction.

## 5 Conclusions

This study is among the few contributions providing actual figures on how much financial and human resources DMOs allocate to social media activities. In addition, it relates the budgets to the number of overnight stays. This kind of benchmark is valuable for practitioners. Our study has also analysed the relationship between



DMOs' resources invested in social media activities and several metrics indicating the return from these activities. Although ROI is a key performance indicator in most organizations, it remains rather intangible for social media in DMOs, where direct sales are not the core focus. While social media are considered important by many academics (see e.g. Leung et al., 2013), resource allocations (budget and manpower) observed in our study remain marginal, at best. This pattern is in line with Milwood et al. (2013). However, the correlation analysis (H3) shows a weak link between hours of manpower dedicated to Facebook/YouTube/Google+ activities and KPIs. As shown in Table 4, success on social media is in many cases significantly correlated with the amount of posts (H4), and creating posts needs manpower. As manpower seems not to be the only success factor, further research could focus on other aspects such as quality of posts or creativity of social media managers in DMOs.

Overall, our survey data suggest that social media is not a substantial driver for website traffic in Swiss DMOs. Yet, some of the correlations (e.g. positive relationship between social media staffing and website success in H2) hint at possibly promising avenues for further research on social media's effect on website success. For many DMOs, the path of becoming "social" poses an array of challenges. From keeping up with emerging social platforms, to building engaged followers, to measuring success, implementing a social media strategy is a complex undertaking. Our analysis indicates a strong relationship between staffing and certain social media KPIs (especially for YouTube). Further research might explore the causality between time spent on social media by DMO staff and number of posts on social media platforms (H3). Do DMOs successfully engage social media users and trigger reactions, or do they rather react to posts by social media users triggered by other events—positive or negative? Answering this question may require more sophisticated methods considering the valence, source, and chronology of posts.

The empirical basis of this preliminary study is limited in terms of sample size and origin. Future studies addressing (causal) relationships between social media investments and performance should widen the scope of the sample and include DMOs from other countries. For example, Milwood et al. (2013) found U.S. DMOs are ahead in social media adoption. The level of social media adoption, but also the DMOs' target markets (e.g. in terms of age and nationality) may play a relevant role. The counterintuitive positive correlation between social media budget and Alexa page rank might be related to the very low level of social media spending and probably also to reliability issues with Alexa. As Alexa states, rankings for websites with relatively low traffic (i.e. global traffic ranks of 100,000+) are rough estimates and subject to greater volatility (<https://support.alexa.com/hc/en-us/articles/200461920-Are-there-known-biases-in-Alexa-s-traffic-data>—[September 8, 2015]). The high positive correlations found for H4 have to be interpreted with caution as some of the KPIs (e.g. page performance or number of likes) are closely (mechanically) linked to the number of posts. DMOs should not use purely volume-based metrics as their main success indicators, but rather indicators measuring engagement. Finally, this study has focussed on non-financial effects of marketing activities of DMOs. Even though the immediate social media objectives are often

non-financial, the ultimate goal of organizations is to generate revenue and profit. It remains therefore an important task to analyse to what extent DMOs' social media efforts contribute to generating revenue and profit for stakeholders in the destination.

## References

- Boyd, D. M., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210–230.
- Buhalis, D., & Mamalakis, E. (2015). Social media return on investment and performance evaluation in the hotel industry context. In I. Tussyadiah & A. Inversini (Eds.), *Information and Communication Technologies in Tourism* (pp. 241–253). Springer.
- Buhalis, D., & Wagner, R. (2013). E-destinations: Global best practice in tourism technologies and applications. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism* (pp. 119–130). Berlin: Springer.
- Caliesch, D., & Liebrich, A. (2012). Organisational challenges of using social media marketing: The case of two network carriers. In P. Keller & C. Laesser (Eds.), *New challenges for tourism promotion: Tackling high competition and multimedia changes* (pp. 71–84). Berlin: Erich Schmidt Verlag.
- Corcoran, S. (2009). Sean corcoran's blog defining earned, owned and paid media. Retrieved May 1, 2015, from [http://blogs.forrester.com/interactive\\_marketing/2009/12/defining-earned-owned-and-paid-media.html](http://blogs.forrester.com/interactive_marketing/2009/12/defining-earned-owned-and-paid-media.html)
- Denning, S. (2015). Has Google + Really Died? Retrieved July 16, 2015, from <http://www.forbes.com/sites/stevedenning/2015/04/23/has-google-really-died/>
- Dischler, J. (2015). Building for the next moment. Retrieved July 5, 2015, from <http://adwords.blogspot.ch/2015/05/building-for-next-moment.html>
- Enge, E. (2015). Hard numbers for public posting activity on google plus. Retrieved July 16, 2015, from <https://www.stonetemple.com/real-numbers-for-the-activity-on-google-plus/>
- Fisher, T. (2009). ROI in social media: A look at the arguments. *Journal of Database Marketing and Customer Strategy Management*, 16(3), 189–195.
- Gilbert, E., Bakhshi, S., Chang, S., & Terveen, L. (2013). "I need to try this"?: A statistical overview of pinterest. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems – CHI '13* (pp. 2427–2436).
- Gundotra, V. (2011). Introducing the google + project: Real-life sharing, rethought for the web. Retrieved July 16, 2015, from [http://bit.ly/gp\\_released](http://bit.ly/gp_released)
- Hall, C., & Zarro, M. (2012). Social curation on the website Pinterest.com. In *Proceedings of the ASIST Annual Meeting* (Vol. 49).
- Hoffman, D. D. L. D. L., & Fodor, M. (2010). Can you measure the roi of your social media marketing? *MIT Sloan Management Review*, 52(1), 41–49.
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1), 59–68.
- Kaplan, A. M., & Haenlein, M. (2011a). The early bird catches the news: Nine things you should know about micro-blogging. *Business Horizons*, 54(2), 105–113.
- Kaplan, A. M., & Haenlein, M. (2011b). Two hearts in three-quarter time: How to waltz the social media/viral marketing dance. *Business Horizons*, 54(3), 253–263.
- Kaske, F., Kügler, M., & Smolnik, S. (2011). Return on investment in social media – Does the hype pay off? Towards an assessment of the profitability of social media in organizations. In *Proceedings of the Annual Hawaii International Conference on System Sciences* (pp. 3898–3907).

- Kumar, V., & Mirchandani, R. (2012). Increasing the ROI of social media marketing. *MIT Sloan Management Review*, 54(1), 55–61.
- Lenskold, J. (2003). *Marketing ROI: The path to campaign, customer, and corporate profitability*. New York, NY: McGraw-Hill.
- Leung, D., Law, R., van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel and Tourism Marketing*, 30(1–2), 3–22.
- Lewis, M. (2012). A new social ROI framework (Infographic). Retrieved October 22, 2015, from <http://www.socialnomics.net/2012/09/20/a-new-social-roi-framework-infographic/>
- Litvin, S. W., Goldsmith, R. E., & Pan, B. (2008). Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*, 29(3), 458–468.
- Magno, G., Comarella, G., Saez-Trumper, D., Cha, M., & Almeida, V. (2012). New kid on the block: Exploring the google+ social graph. In *Proceedings of the 2012 ACM Conference on Internet Measurement Conference* (pp. 159–170). New York, NY: ACM.
- Meeker, M. (2015). *2015 Internet Trends*. Retrieved from <http://www.kpcb.com/internet-trends>
- Milwood, P., Marchiori, E., & Zach, F. (2013). A comparison of social media adoption and use in different countries: The case of the united states and switzerland. *Journal of Travel and Tourism Marketing*, 30(1–2), 165–168.
- Minazzi, R. (2014). *Social media marketing in tourism and hospitality*. Heidelberg: Springer.
- OECD. (2007). *Participative Web and User-Created Content: Web 2.0, Wikis and Social Networking*.
- Peters, K., Chen, Y., Kaplan, A. M., Ognibeni, B., & Pauwels, K. (2013). Social media metrics – A framework and guidelines for managing social media. *Journal of Interactive Marketing*, 27(4), 281–298.
- Pike, S., & Page, S. J. (2014). Destination marketing organizations and destination marketing: A narrative analysis of the literature. *Tourism Management*, 41, 202–227.
- Pourfakhimi, S., & Ying, T. (2015). The evolution of eTourism research: A case of ENTER conference. In I. Tussyadiah & A. Inversini (Eds.), *Information and Communication Technologies in Tourism* (pp. 859–871). Springer.
- Tirunillai, S., & Gerard, J. T. (2012). Does chatter really matter? Dynamics of user-generated content and stock performance. *Marketing Science*, 31(2), 198–215.
- We Are Social. (2015). *DIGITAL, SOCIAL & MOBILE IN 2015*. Retrieved from [slideshare.net/wearesocials/digital-social-mobile-in-2015](http://slideshare.net/wearesocials/digital-social-mobile-in-2015)
- Westbrook, R. A. (1987). Product/consumption-based affective responses and postpurchase processes. *Journal of Marketing Research*, 24(3), 258–270.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179–188.
- Zeng, B., & Gerritsen, R. (2014). What do we know about social media in tourism? A review. *Tourism Management Perspectives*, 10, 27–36.

# Alpine Tourists' Willingness to Engage in Virtual Co-Creation of Experiences

Thomas Wozniak, Andreas Liebrich, Yves Senn, and Myrta Zemp

**Abstract** This paper explores tourists' willingness to engage in virtual co-creation of experiences on site. Theoretically, we build upon the concept of co-creation, its application to tourism, and distinguish between virtual and physical co-creation environments. We draw upon the conceptualization of the destination as a system of fragmented individual tourism suppliers that—together with the tourist herself—form a network of tourism stakeholders. Data were collected “in situ” in 26 in-depth interviews with international and domestic tourists in an alpine destination. Mainly younger tourists were found to be open to receive push-based personalized messages. Tourists' willingness to disclose private information was found to be contingent on the type of information, but seems also affected by the perceived added value, the ease of use of disclosing information, and trust in the service provider. Sharing of disclosed information across service providers appears to be no major obstacle to virtual co-creation.

**Keywords** Co-creation • Personalization • Privacy • Smartphone • Alpine destination • Smart tourism

## 1 Introduction

People's increasing use of mobile devices such as smartphones in everyday life and while travelling potentially transforms the travel experience (Wang & Fesenmaier, 2013; Wang, Xiang, & Fesenmaier, 2014a, 2014b). Among all phases of travel, mobile devices' biggest impact is regarded to be on site, i.e. while the tourist is in the destination (Neuhofer, Buhalis, & Ladkin, 2012; Wang & Fesenmaier, 2013). In light of increasing competition, destinations must provide unique experiences to sustainably attract visitors and to be able to charge premium prices (Buhalis, 2000). Moreover, simply staged experiences contradict tourists' wish for authentic and unique experiences (Buhalis, 2000; Prahalad & Ramaswamy, 2004). Thanks to mobile devices such as smartphones, destination experiences can reach new levels

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of interaction (Neuhofer et al., 2012). In fact, smartphones can be considered a rich and multi-way digital link to and from the tourist while being in a destination. As tourists are prosumers and co-creators of their experiences (Neuhofer et al., 2012), they constitute the key stakeholder in the co-creation of experiences. With regard to virtual co-creation environments on site, tourists' smartphones constitute an important technological element (Neuhofer et al., 2012). Further, together with sensors embedded in the environment, smartphones are considered the core technology of Smart Tourism (Gretzel, Sigala, Xiang, & Koo, 2015), a concept yet predominantly applied to city destinations (Boes, Buhalis, & Inversini, 2015). Enabled and mediated by such ICT, personalized and thus unique experiences can be co-created on site (Buhalis & Foerste, 2015; Gretzel et al., 2015; Neuhofer et al., 2012). SoLoMo and SoCoMo marketing are closely related concepts (Buhalis & Foerste, 2015). The common denominator of these concepts—namely virtual co-creation of experiences, Smart Tourism, and SoCoMo marketing—is the co-creation of unique value in the form of personalized experiences on site, based on a plethora of information about the tourist and her context. For putting this into practice, the involved stakeholders need to effectively address a wide array of challenges (Buhalis & Foerste, 2015; Gretzel et al., 2015). Focussing on the tourist herself as the central stakeholder in the co-creation of personalized experiences on site, key challenges concern privacy, attitude towards co-creation and mobile marketing, and the value or benefit generated (Buhalis & Foerste, 2015; Gretzel et al., 2015). Empirical evidence on these aspects is scarce (see e.g. Buhalis & Foerste, 2015; Gretzel et al., 2015). Thus, this paper explores tourists' willingness to engage in the virtual co-creation of experiences in the on-site travel phase. It focuses on alpine destinations, a type of destination yet insufficiently covered with regard virtual co-creation of experiences and Smart Tourism.

## 2 Literature Review

### 2.1 *Technology-mediated Co-creation of Personalized Experiences On Site*

Prahalad and Ramaswamy (2004) criticised the firm-centric view of staging experiences and challenged it by the concept of co-creation as the “*joint* creation of value by the company and the customer” (p. 8). In tourism, the co-creation of experiences involves a network of various stakeholders (Binkhorst & Den Dekker, 2009), including tourism suppliers, the destination marketing organization (DMO), and the individual tourist (Neuhofer et al., 2012). The co-creation of tourism experiences can take place in physical and virtual experience environments (Neuhofer et al., 2012). ‘Virtual’ refers to the mediation of the co-creation and resulting experiences through and their facilitation by ICT, first and foremost through and by the Internet, Web 2.0, and social media (Binkhorst & Den Dekker,

2009; Neuhofer et al., 2012; Tussyadiah & Fesenmaier, 2009). With regard to the temporal dimension, Neuhofer et al. (2012) consider “the on-site phase [. . .] as the most intriguing phase for DMOs, with multiple levels of engagement that allow destinations to co-create experiences with the tourist in the physical and virtual setting at the same time” (p. 41). Especially in the on-site phase, tourists' mobile devices (e.g. smartphones, tablet computers, and wearables) constitute a cornerstone for virtually linking the tourist to the network of tourism stakeholders, thereby enabling the virtual co-creation of experiences without spatiotemporal constraints. Moreover, tourists' mobile devices allow the constant interaction between the tourist and the network of other tourism stakeholders as the foundation for co-constructing personalized experiences of unique value (Pralhad & Ramaswamy, 2004).

An intriguing way in which the virtual co-creation on site can materialize is providing the tourist with personalized information and recommendations via her mobile device in real time (Neuhofer et al., 2012), based on the tourist's profile and context (Habegger et al., 2014). However, location and other types of information used for personalization can often be considered private and thus raise privacy issues (Habegger et al., 2014). This may inhibit the tourist's provision of such information. But because information on the tourist's profile and context is the basis for personalization (Habegger et al., 2014), the tourist's willingness *to explicitly or implicitly provide private information* is crucial for enabling personalization of information and recommendations as one kind of virtual co-creation. In addition, as the virtual co-creation of tourism experiences involves a network of stakeholders (Binkhorst & Den Dekker, 2009; Neuhofer et al., 2012), the tourist's willingness *to permit such sharing of private information across a network of various tourism stakeholders* is also crucial for personalizing information and recommendations as one form of virtually co-creating tourism experiences. Research on this matter is in its very infancy. A study by Buhalis and Amaranggana (2015) about personalization of services in so-called Smart Tourism Destinations found that most of their 13 interviewees welcome personalized services although privacy concerns exist and the majority of the interviewees would not allow sharing their data across different tourism service providers. In the mobile context, research outside the tourism domain has just recently started to explore this phenomenon also known as the personalization-privacy paradox (e.g. Sutanto, Palme, Tan, & Phang, 2013).

## 2.2 *Smart Tourism Destinations in Alpine Regions*

The use of ICT for enriching tourist experiences in order to enhance destinations' competitiveness is an integral part of Smart Tourism Destinations (Buhalis & Amaranggana, 2014). The concept of the Smart Tourism Destination has evolved from the Smart City concept (Buhalis & Amaranggana, 2014). A Smart Tourism Destination can be defined as “an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development

of tourist areas, accessible to everyone, which facilitates the visitor's interaction with, and integration into, his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life" (López de Ávila, 2015, n. p.). More specifically, in a Smart Tourism Destination, different types of stakeholders (including tourism organizations and tourists) are dynamically interconnected through a technological platform allowing the instant exchange of information related to tourism activities (Buhalis & Amaranggana, 2014). Thus, tourists can benefit from a variety of different applications (e.g. Augmented Reality for enhanced interpretation of attractions, real-time information on transport, POI information accessible through QR codes or NFC tags, and feedback systems for registering complaints or praise) (Buhalis & Amaranggana, 2014). Through such and other data sources (e.g. WLAN-based positioning), tourist organizations can learn about tourists' on-site behaviour in real time; respective knowledge is the basis for "recommending tourists most promising matches with the actual destination offer [via intelligent mobile end-user applications], thus, enhancing tourists' quality of experience" (Fuchs, Höpken, & Lexhagen, 2014). "Research in the area of smart tourism remains very limited and mostly provides case studies of existing initiatives" (Gretzel et al., 2015, p. 6). Regarding the consumption of smart experiences, open research topics are (1) privacy concerns, (2) attitudes towards co-creation, (3) value derived, (4) physiological consequences of ubiquitous connectivity, (5) the need or desire for escape from technology, and (6) technology access (Gretzel et al., 2015). Buhalis and Amaranggana (2015) provided indicative empirical evidence on a number of personalized services that could add value to tourists in different phases of travel. A recurring topic inherent to many of these services is the provision of relevant real-time information and personalized services based on user profiling (Buhalis & Amaranggana, 2015).

In addition, the concept of the Smart Tourism Destination has mainly been applied to city destinations as it emerges from the Smart City concept (e.g. Boes et al., 2015; Buhalis & Amaranggana, 2014; Gretzel et al., 2015). Del Chiappa and Baggio (2015) compare an alpine destination with two destinations in marine areas by basing their research on the Smart City concept. Their study confirms that "a strong structural cohesion between the real and the virtual components of a destination can and does exist [in all three destinations]" (Del Chiappa & Baggio, 2015, p. 4). Thus, applying the Smart City concept to alpine destinations can make sense. Alpine destinations are currently undergoing massive structural changes due to a decreasing demand of ski tourism, lack of natural snow due to global warming, or strong competition such as beach destinations that are easily reachable with low-cost airlines (Müller-Jentsch, 2015). Moreover, in most alpine tourism destinations, the majority of service providers are SMEs with various options to co-operate with each other (Pechlaner, 2003). Thus, one way how alpine destinations may address the challenges they face is the co-creation of unique experiences by several SME-sized service providers in the destination and the tourist, facilitated and mediated by ICT and so making the destination smarter and more competitive.



### ***2.3 The Use of Mobile Technologies by Destinations and Tourists***

Research interest in mobile technologies and systems in tourism has significantly grown (Pourfakhimi & Ying, 2015). This is most certainly due to the enormous advancement and wide penetration of mobile technologies. As smartphones have replaced traditional mobile phones to a large extent, they are constantly carried and used on a continuous basis in everyday life and increasingly while travelling (Shankar & Balasubramanian, 2009; Wang et al., 2014a). Considering the plethora of functionalities of today's smartphones paired with rich mobile applications for mobile platforms such as Apple iOS and Google Android (Abolfazli, Sanaei, Gani, Xia, & Yang, 2014), smartphones may well be considered as the Swiss Army knife of contemporary tourists (see also Dickinson et al., 2014). A study analyzing currently available apps in the domestic tourism travel domain found that (a) - two-way sharing capabilities involving location and social information and (b) context awareness predominantly based on location and time are among prevalent app functions (Dickinson et al., 2014). Both functions contribute to enabling the personalization of information or recommendations. Based on a benchmark of 30 international tourism destinations, Buhalis and Wagner (2013) found that most destinations do not yet leverage emerging technologies in order to facilitate the tourist's stay in the destination and that destinations should look into "mobile technologies in the form of destinations apps and location based services" (p. 126). As native apps typically allow accessing all of the various sensors integrated in today's smartphones (Abolfazli et al., 2014) and location is a primary type of context (Dey & Abowd, 2000), this hints at the personalization of information, recommendations, or services based on the specific situation of the tourist on site.

Demand-side studies have analyzed tourists' smartphone usage along different travel phases and subsequent effects on the tourist experience (Wang & Fesenmaier, 2013; Wang et al., 2014a), the role of smartphones in mediating the tourist experience (Wang, Park, & Fesenmaier, 2012), spill-over effects from smartphone usage in everyday life into travel (Wang et al., 2014b), the acceptance of mobile tourism services (Bader, Baldauf, Leinert, Fleck, & Liebrich, 2012), and the use of smartphones by millennials while travelling or being in a destination (Dewan & Benckendorff, 2013; Gotardi, Senn, Cholakova, Liebrich, & Wozniak, 2015). These studies form a distinct stream of research and have deepened the understanding of the smartphone's role and effects in the tourism and travel domain, but also indicate the need for further work. First, several studies focus on domestic travel (Bader et al., 2012; Wang et al., 2014a). Even though domestic travel has considerable relevance in many countries, international travel is widely spread and thus cannot be left out. In fact, extant research shows the smartphone's use and potential effects are different in an international context (Dewan & Benckendorff, 2013; Gotardi et al., 2015). Second, most of the studies either recruit respondents who have travelled at least once in a specific time frame (Wang &



Fesenmaier, 2013), random consumers (Wang et al., 2014b), or students as a non-probability sample (Dewan & Benckendorff, 2013). However, except Gotardi et al. (2015), none of the aforementioned demand-side studies approached tourists “in situ”, i.e. when tourists are on site and in the midst of the tourism experience. Such “in situ” sampling may be more appropriate to shed light on destination experiences. Third, most of the studies did not focus on a specific type of destination. However, destinations do vary in terms of size, geographical features, attractions, guest segments, and their legal organization (Freyer, 2015). Such specificities may well affect (a) the type of experience tourists seek, (b) how tourism suppliers and the DMO leverage technology to improve the tourist experience, and (c) to what extent tourists are willing to engage in the virtual co-creation of experiences.

### 3 Methodology

A qualitative approach was taken to explore tourists’ willingness to engage in virtual co-creation of experiences. 26 semi-structured interviews were conducted in different locations within the alpine destination of Saas-Fee/Saastal, situated in the canton of Valais, Switzerland. Semi-structured interviews were chosen because the investigated topics are fairly specific, but the interviewees should have “a great deal of leeway in how to reply” (Bryman & Bell, 2015, p. 481). Screening criteria included staying in the destination for at least one night and having brought along one’s smartphone. To match the typical visitor mix of the destination, quota sampling was applied. Quota sampling criteria included country of origin (50 % domestic and 50 % international), age, and socioeconomic group (see Table 1). The interviews were conducted in German, English, and French over a period of 10 days in February 2015 using a paper-based interview guide. The voice-recorded interviews were manually transcribed verbatim and then coded using MAXQDA. While pre-defined questions posed the overarching dimensions analyzed, open coding was employed to identify recurring topics and create categories (Corbin & Strauss, 1990). Due to the qualitative nature of the interviews, not all pre-defined questions could be addressed in all interviews. Thus, selected results concern less than 26 interviews.

**Table 1** Sample characteristics

Socioeconomic group	Age group			
	18–24 ( <i>n</i> = 4)	25–35 ( <i>n</i> = 5)	36–49 ( <i>n</i> = 7)	50–65 ( <i>n</i> = 10)
<i>Young Single</i> ( <i>n</i> = 4)	YS#1—YS#4	–	–	–
<i>Family</i> ( <i>n</i> = 8)	–	FAM#1—FAM#3	FAM#4—FAM#8	–
<i>DINK</i> ( <i>n</i> = 4)	–	DINK#1, DINK#2	DINK#3, DINK#4	–
<i>50+</i> ( <i>n</i> = 10)	–	–	–	50 + #1—50 + #10

## 4 Results

We have conceptualized the personalization of information and recommendations as a distinct form of virtual co-creation among a network of multiple tourism stakeholders, with mobile devices such as smartphones as the multi-way link to the tourist. Conceptually and empirically, this comprises (a) the willingness to receive relevant push-based information or recommendations, (b) the willingness to disclose different types of private information, and (c) the willingness to permit the sharing of such information between multiple stakeholders in a destination.

### 4.1 *Receiving Relevant Push-Based Information and Recommendations*

In the course of the interviews, respondents were asked whether they would want to receive push-based information, recommendations, or promotional offers on their smartphones while being on site. 14 out of 24 respondents stated to be open to receive such messages. These 14 respondents provided insights about the following aspects:

- Attitude: Statements like “Give me ideas, I am on vacation!” (FAM#1), to “I would look at it for sure.” (FAM#8), to “Yeah, as long as I am not bombarded.” (50 + #6) well demonstrate how the attitude ranges from almost demanding such messages to rather accepting them.
- Quantity: Some respondents do not want too many messages (50 + #6, 50 + #7, DINK#3) while another clearly stated to be willing to receive them daily (50 + #2).
- Quality mainly concerns relevance. Push messages are welcome if they are relevant, but not spam (50 + #6, FAM#4) or advertising-like messages (DINK#3).
- Where and when of delivery: Two respondents stressed that they would only want to receive messages while being on site and not at home (50 + #2, 50 + #6). The morning hours were pointed out as a suitable daytime (50 + #2, DINK#3).
- Contents: Promotional offers (DINK#4, YS#4), information on happy hours (DINK#3, YS#4) as well as on events and activities in the destination (DINK#3), and updates on skiing conditions (DINK#3).

Major reasons mentioned for being **not** willing to receive push-based messages were preference for a pull approach and fear of receiving too many messages:

- Five respondents prefer a pull versus a push approach (50 + #1, 50 + #4, 50 + #5, 50 + #8, FAM#2). Specifically, they stated a well structured app (50 + #5) or an app with up-to-date information including ads on current events (50 + #4) would suffice, or preferring to simply go online when looking for up-to-date

information (50 + #1). On a more general level, preference for well presented and easy-to-find information (50 + #8) and a nonintrusive and discreet manner of how things are being offered (FAM#2) were highlighted.

- Two respondents are afraid of receiving too many messages (50 + #1, 50 + #5).

These results seem to be contingent on age. While the majority of 50+ people interviewed are not willing to receive push messages, most interviewees younger than 50 are open towards receiving promotional offers. Moreover, singles and DINKs have clear ideas about the content of push messages.

## 4.2 *Disclosing Different Types of Private Information*

Because the personalization of information and recommendations requires information about the tourist's profile and context (Habegger et al., 2014), respondents were asked whether they would be willing to provide different types of personal information to the hotel where they stayed to improve their experience.

**Demographic Information** The vast majority of the respondents (21 out of 26) would be willing to provide demographic information. Some of these respondents (mainly 50+) pointed out the following limitations:

- Two respondents highlighted they would not provide information on their income (50 + #5, 50 + #10) and one would only provide anonymized information (50 + #7).
- Respondent FAM#2 pointed out that the receiver of the information would need to be known and trusted.
- Respondent 50 + #6 complained about being “bombarded” with seemingly irrelevant emails from websites like booking.com or rental.com and would be much willing to provide information such as demographics if this enables tourism suppliers to target the respondent more precisely.

From those **not** willing to provide demographic information (50 + #2, 50 + #9, FAM#3, FAM#6, YS#4), respondent 50 + #9 would not be willing to provide age and for respondent 50 + #2 it was not clear what in particular would be improved.

**Personal Preferences** 15 out of 26 respondents would provide information on their personal preferences (e.g. their favourite dish). Three of the remaining respondents were somewhat ambiguous:

- Respondent 50 + #10, a vegetarian, stated: “Not really, again, if it would be a topic I am specifically interested in. Then maybe. Generally speaking no. There needs to be a reason. I need to know why you want to know. But if I see a reward or benefit, then yes.”
- Respondent DINK#3 stated to be impressed by personalized service as a result of previously disclosed personal preferences, but—at the same time—would feel uncomfortable or even controlled if such information is inadequately used.

- Similarly, respondent YS#4 stated to be impressed by personalized service as the result of previously provided personal preferences, “but [actually] I wouldn’t want to tell them. I want them to find out [my personal preferences]”.

Taken together, these statements vividly hint at two issues: first, the specific added value or benefit of disclosing (any kind of) private information must be present and clear; and second; even if such benefit is present and clear, people may still be reluctant to disclose the private information required to make the personalization work. The reasons for this paradox can obviously be of different nature.

**Personal Interests** 10 (six representatives of FAMilies, three 50+, and one DINK) out of 17 respondents stated to be willing to disclose their personal interests. One of the remaining seven respondents was ambiguous stating he would not want to receive standard advertisements like one should cycle, but at the same time would only be willing to disclose personal interests if the effort required to do so is next to zero (e.g. just telling the hotelier during breakfast) (DINK#3). One of the respondents not willing to disclose personal interests raised privacy concerns (FAM#3).

**Location** 7 out of 20 respondents (50+#3, 50+#6, 50+#8, 50+#10, DINK#3, FAM#6, FAM#8) stated to be willing to disclose their current location in the destination in order to improve their experience on site. Respondent FAM#8 noted that most of the time, one’s location is known anyway and simply accepts this. Three of out of the seven respondents pointed out the following limitations and conditions:

- Time: Respondent 50+#6 would only share the current location until 8 pm.
- Adequate use: Respondent 50+#8 said that sharing the current location is fine as long as this information is used the right way. Misuse such as receiving “messages all the time” would be annoying and prevent 50+#8 from sharing current location.
- Preference for pull approach: Respondent FAM#6 rather referred to a pull approach, i.e. sharing of location is acceptable if an app shows surrounding attractions or POIs whereas general location sharing would not be permitted.

From the remaining 13 respondents, certain young-single (YS#1, YS#3) and DINK respondents (DINK#1, DINK#2) would provide their location history (e.g. where they have skied already) to improve their experience on site. A further respondent would provide the current location in case of an emergency situation (YS50+#3).

Overall, around half of the respondents would share their location to improve their experience on site—seven respondents their current location and four respondents only their location history. Interestingly, young-single respondents seem not be willing to share their current location.

**Social Contacts** Compared to the previously covered types of information, information about one’s social contacts (e.g. Facebook friends or WhatsApp contacts) is clearly most critically viewed. Only 3 out of 21 respondents (50+#8, DINK#3,

FAM#7) would be willing to share such information with the hotel, all of these in the context of word of mouth (WOM) or referrals.

**General Observations** Generally and independent of specific types of information, the results hint at four recurring issues. First, a lack of perceived benefit or added value can prevent information disclosure (e.g. 50+#2, 50+#10). Second, among those willing to disclose certain types of information, the effort needed to do so can be critical. Four respondents stated they would not be willing to fill in a questionnaire (50+#8, DINK#3, FAM#3, FAM#4) or that disclosing information should involve no effort (DINK#3). In addition, respondent YS+#4 stated certain information can be disclosed or known, but would be reluctant to actually provide it (“They should find out themselves.”, paraphrased from interview). Third, trust in the entity receiving the information can facilitate the willingness to disclose information. Respondent DINK#3 noted that frequent stays and trust in the hotel would lead to disclose more information, plus that trust in the hotelier would determine the provision of information on social contacts. Respondent FAM#1 noted that especially for hotels, it would be important to well know returning visitors and that this would develop with the relationship with the hotel. Fourth, both those willing to disclose certain types of private information and those not willing are sensitive towards the quantity of messages. While for the former, the limited number of messages is important, for the latter, fear of receiving too many may prevent them from information disclosure.

### ***4.3 Permitting Sharing of Private Information Across Multiple Stakeholders***

Because private information about the tourist may need to be shared across different stakeholders to most effectively personalize information and recommendations for the tourist, respondents were asked whether they would permit the sharing of private information between the hotel and the local DMO.

Half of the 26 respondents would be willing to permit the sharing of information disclosed to the hotel with local DMO. Two of these respondents declared they would only permit the sharing of anonymized information (FAM#1, DINK#3). While one respondent would allow sharing only under the condition that it is (a) optional and (b) the information stays within the boundaries of the destination (50+#6), another respondent pointed out that the shared information should be transferrable to other destinations so that it would not need to be provided again when visiting other destinations (FAM#4). Further conditions mentioned for permitting the sharing were receiving only a limited amount of messages (DINK#3) and that personalization should actually work (FAM#4). In addition, respondent FAM#2 highlighted the wish for information from official authorities and would therefore also permit the sharing of private information with such official authorities such as a DMO.

Reasons for not permitting the sharing of information between hotel and DMO were perceived lack of control (50 + #6, FAM#8), being afraid of misuse (50 + #8) or receiving too many messages (50 + #4), and uncertainty about the benefit or added value (50 + #2). A further respondent highlighted that one would need to know the specific reason for permitting the sharing, that trust in the hotelier plays a role, and that it would be contingent on whether one revisits the destination (50 + #7).

## 5 Conclusions

This paper has set out to explore alpine tourists' willingness to engage in virtual co-creation of experiences on site and expands the body of knowledge by adding to the very few empirical contributions in this area. When experiences are co-created, the interaction between all stakeholders is regarded as the 'locus of value creation' (Binkhorst & Den Dekker, 2009; Prahalad & Ramaswamy, 2004). In virtual co-creation environments (Neuhofer et al., 2012), the interaction concerns the exchange of information, which marks a cornerstone of the virtual co-creation of experiences. Specifically, this paper has addressed tourists' willingness to (a) receive personalized messages from tourism suppliers while being on site, (b) disclose private and thus sensitive information to improve their experience on site, and (c) permit the sharing of such information across multiple stakeholders in the destination. Regarding the reception of push-based personalized messages, we found that around half of respondents—mainly the young ones—would be willing or open to receive them. However, the limited quantity and a high quality of messages are crucial for all respondents willing to receive these messages. In addition, we identified the preference for a pull versus a push approach as a seemingly major reason for not wanting to receive push messages. Both the fear of receiving too many messages and the preference for a pull approach may be explained by the conception of privacy as non-intrusion or as accessibility privacy (Tavani, 2007). This may be particularly relevant for tourism experiences on site that are pursued for escapism as both experiential element and motive (Mehmetoglu & Engen, 2011).

We found that the willingness to disclose private information strongly varies by type of information. While demographics would almost unanimously be disclosed, around half of respondents would disclose their personal preferences and interests. Regarding location, it seems to make a difference whether the current location is constantly disclosed or one's whereabouts are retrospectively made available. Only few respondents would disclose social information. Generally, the interviews made clear four aspects independent of the type of disclosed information. These are relevant for academics and practitioners alike. First, a lack of perceived benefit or added value can prevent information disclosure. Put differently, the added value of disclosing any kind of private information must exist and needs to be well communicated to the tourist. Second, even if the added value is clear to the tourists, they may still be reluctant to disclose the private information required to make the

personalization work. The perceived ease of use and/or effort of disclosing information may partially explain this paradox. Thus, DMOs or tourism suppliers need to ensure an easy-to-use disclosure process that requires only minimum effort for the tourist. The motivation to disclose information may further be enhanced by employing gamification elements. In addition, this reminds DMOs or tourism suppliers aiming to employ personalization to strongly focus on inferring tourists' needs from mining data not explicitly given (e.g. from turnstiles and RFID-based access solutions). Third, trust in the entity receiving the information can facilitate the willingness to disclose information. Because trust can develop over time and especially when a destination and/or hotel is—repeatedly—revisited, this seems especially challenging for first-time visitors or at least in the early phase of tourists' stay in the destination. Fourth, the worry or fear of receiving too many messages needs to be taken seriously. Thus, tourists must not be sent too many messages and those sent must be relevant. In addition, the option to opt out of receiving messages must be present anytime. DMOs and tourism suppliers would also be well advised to employ mechanisms that allow them to learn why tourists opt out. Contrary to the findings of Buhalis and Amaranggana (2015), we found that half of the respondents would be willing to permit the sharing of private information across different stakeholders in a destination. This may be due to the smaller size of alpine destinations as compared to city destinations and to the “in situ” data collection. Both aspects increase the probability that the tourist actually knows the involved stakeholders.

Finally, there seem to be different types of tourists when it comes to their overall engagement in the virtual co-creation of experiences. Age does not seem to explain differences across all analyzed elements. Further qualitative research is needed to deepen the understanding of the concept of virtual co-creation of experiences. This could set the ground for quantitative research, e.g. to segment tourists according to their willingness to engage in virtual co-creation. Such segmentation would help practitioners to use the promising technology more effectively. The willingness of guests to co-create is only one prerequisite to be successful in co-creation within a destination. Options for the users to choose levels of privacy or disclosing information (Buhalis & Foerste, 2015), interoperability between ICT infrastructures of the service providers, and a good strategic fit between the co-operating service providers are imperative for success (Cabiddu, Lui, & Piccoli, 2013).

## References

- Abolfazli, S., Sanaei, Z., Gani, A., Xia, F., & Yang, L. T. (2014). Rich mobile applications: Genesis, taxonomy, and open issues. *Journal of Network and Computer Applications*, 40(1), 345–362.
- Bader, A., Baldauf, M., Leinert, S., Fleck, M., & Liebrich, A. (2012). Mobile tourism services and technology acceptance in a mature domestic tourism market: The case of Switzerland. In *Information and Communication Technologies in Tourism*.

- Binkhorst, E., & Den Dekker, T. (2009). Agenda for co-creation tourism experience research. *Journal of Hospitality Marketing & Management*, 18(2–3), 311–327.
- Boes, K., Buhalis, D., & Inversini, A. (2015). Conceptualising smart tourism destination dimensions. In *Information and Communication Technologies in Tourism* (pp. 391–403). Springer.
- Bryman, A., & Bell, E. (2015). *Business research methods*. Oxford, England: Oxford University Press.
- Buhalis, D. (2000). Marketing the competitive destination of the future. *Tourism Management*, 21(1), 97–116.
- Buhalis, D., & Amaranggana, A. (2014). Smart tourism destinations. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism* (pp. 553–564). Cham: Springer.
- Buhalis, D., & Amaranggana, A. (2015). Smart tourism destinations enhancing tourism experience through personalisation of services. In *Information and Communication technologies in Tourism* (pp. 377–389). Springer.
- Buhalis, D., & Foerste, M. (2015). SoCoMo marketing for travel and tourism: Empowering co-creation of value. *Journal of Destination Marketing & Management*, 4, 151–161.
- Buhalis, D., & Wagner, R. (2013). E-destinations: Global best practice in tourism technologies and applications. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism* (pp. 119–130). Berlin, Heidelberg: Springer.
- Cabiddu, F., Lui, T. W., & Piccoli, G. (2013). Managing value co-creation in the tourism industry. *Annals of Tourism Research*, 42, 86–107.
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3–21. doi:10.1007/BF00988593.
- Del Chiappa, G., & Baggio, R. (2015). Knowledge transfer in a tourism destination: the effects of a network structure. *Journal of Destination Marketing & Management*.
- Dewan, I., & Benckendorff, P. (2013). Impact of Tech Savviness and impulsiveness on the mobile information search behaviour of young travellers. *E-Review of Tourism Research, ENTER 2013*, 1–5.
- Dey, A. K., & Abowd, G. D. (2000). Towards a better understanding of context and context-awareness. In *Proceedings of the CHI 2000 Workshop on The What, Who, Where, When and How of Context Awareness* (Vol. 4, pp. 1–6). The Hague, The Netherlands.
- Dickinson, J. E., Ghali, K., Cherrett, T., Speed, C., Davies, N., & Norgate, S. (2014). Tourism and the smartphone app: Capabilities, emerging practice and scope in the travel domain. *Current Issues in Tourism*, 17(1), 84–101.
- Freyer, W. (2015). *Einführung in die Fremdenverkehrsökonomie* (11th ed.). Berlin, München, Boston: Walter de Gruyter GmbH.
- Fuchs, M., Höpken, W., & Lexhagen, M. (2014). Big data analytics for knowledge generation in tourism destinations—A case from Sweden. *Journal of Destination Marketing & Management*, 3(4), 198–209.
- Gotardi, L., Senn, Y., Cholakova, E., Liebrich, A., & Wozniak, T. (2015). How do millennial travellers use their mobile devices in a city destination?—Empirical evidence from Switzerland. *E-Review of Tourism Research, ENTER 2015*, 1–5.
- Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: foundations and developments. *Electronic Markets*, (JANUARY).
- Habegger, B., Hasan, O., Brunie, L., Bennani, N., Kosch, H., & Damiani, E. (2014). Personalization vs. privacy in big data analysis. *International Journal of Big Data*, 1(1), 25–35.
- López de Ávila, A. (2015). *Smart destinations: The XXI century tourism*. Presented at the ENTER2015 Conference on Information and Communication Technologies in Tourism, Lugano, Switzerland, February 4–6, 2015.
- Mehmetoglu, M., & Engen, M. (2011). Pine and Gilmore's concept of experience economy and its dimensions: An empirical examination in tourism. *Journal of Quality Assurance in Hospitality & Tourism*, 12(4), 237–255.



- Müller-Jentsch, D. (2015). Den Strukturwandel aktiv gestalten. *Avenir Spezial: Wettbewerbsfähigkeit Mit Starkem Franken*, 2, 22–25.
- Neuhofner, B., Buhalis, D., & Ladkin, A. (2012). Conceptualising technology enhanced destination experiences. *Journal of Destination Marketing & Management*, 1(1–2), 36–46.
- Pechlaner, H. (2003). *Tourismus-Destinationen im Wettbewerb*. Wiesbaden: Deutscher Universitäts.
- Pourfakhimi, S., & Ying, T. (2015). The evolution of eTourism research: A case of ENTER conference. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism* (pp. 859–871). Springer.
- Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5–14.
- Shankar, V., & Balasubramanian, S. (2009). Mobile marketing: A synthesis and prognosis. *Journal of Interactive Marketing*, 23(2), 118–129.
- Sutanto, J., Palme, E., Tan, C.-H., & Phang, C. W. (2013). Addressing the personalization–Privacy paradox: An empirical assessment from a field experiment on smartphone users. *MIS Quarterly*, 37(4), 1141–1164.
- Tavani, H. T. (2007). Philosophical theories of privacy: Implications for an adequate online privacy policy. *Metaphilosophy*, 38(1), 1–22.
- Tussyadiah, I., & Fesenmaier, D. R. (2009). Mediating tourist experiences. Access to places via shared videos. *Annals of Tourism Research*, 36(1), 24–40.
- Wang, D., & Fesenmaier, D. R. (2013). Transforming the travel experience: The use of smartphones for travel. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism* (pp. 58–69). Berlin: Springer.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387.
- Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014a). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research*, 48, 11–26.
- Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014b). Smartphone use in everyday life and travel. *Journal of Travel Research*, (January).

# Localization of Three European National Tourism Offices' Websites. An Exploratory Analysis

Emanuele Mele, Silvia De Ascaniis, and Lorenzo Cantoni

**Abstract** With the globalization of traveling, due to favorable socio-economic and political contexts as well as to the tourism communication and marketing supported by ICTs, the issue of translating destinations' websites has become particularly relevant. New in-source markets are not only requiring adequate tourism and hospitality products, and services, they also need a tailor-made communication, which takes into account their language, cultural background, and habits. Such cultural translation is defined as "localization". While there is a wide consensus on the importance of localization especially in the trade and marketing sector, this topic is under-researched in the tourism domain. In this research, three European National Tourism Offices' websites have been analyzed, according to an ad-hoc designed framework, in order to study their localization activities when it comes to the US-American and the Italian-speaking markets. Results have shown that content managers have devoted great attention to localizing the content of National Tourism Offices' websites, thus confirming most of the hypotheses based on Hofstede's cultural model.

**Keywords** eTourism • ICT • Localization

## 1 Introduction

With the globalization of traveling and the massive growth of people turning to the web before the travel decision (Law, Buhalis, & Cobanoglu, 2014), the issue of *localizing* websites has become particularly relevant (Cyr & Trevor-Smith, 2004).

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More specifically, this set of activities can be broken down to all “the processes of modifying products or services to account for differences in distinct markets” (LISA, 2007, p. 11). Once transposed to online communication, apart from translation of textual content, localization of websites comprises activities as adaptation of videos and graphics to address cultural needs and preferences of specific markets (Tigre Moura, Gnoth, & Deans, 2015). Additionally, cultural adaptation in online communication accounts for modifications of time and date formats, units of measure, icons and symbols, which are regarded as important for a better fruition of the information provided to the user (Al-Badi & Naqvi, 2009; De Troyer & Casteleyn, 2004; Singh, Furrer, & Ostinelli, 2004). Following this line of thought, researchers have undertaken studies in order to understand the preferences in terms of website design and cultural manifestation in online communication (Singh et al., 2004). However, little research has been carried out regarding the way of measuring the depiction of cultural values on tourism destination websites (Tigre Moura et al., 2015) and how multimedia content is actually localized for different geographical markets (Cappelli, 2008).

## 2 Literature Review

Along the centuries, the concept of culture has been defined by social scientists in many different ways (Wallerstein, 1990). The English word *culture* comes from the Latin *cultūra*, which derives from the verb *colere* that means “to cultivate”. Namely, when the verb was referred to the land or the country, it meant to cultivate the soil, while when it was referred to men, it indicated the nurturing and training of the human intellect and its skills. The past participle of the verb *colere* is *cultus*, translated into the English word *cult*, which illustrates the act of worshipping God. In its modern connotation, these different meanings are combined in the concept of culture: the methods employed to cultivate the soil developed over time according to the practices of different human communities; human intellect and skills need to be constantly cultivated with education and training in order to become civilized adults, exactly as plants need to be constantly nurtured to grow and bear fruit; the spiritual dimension deeply influences all the other aspects of human life (Cantoni, 2012). Thus, Culture can be defined as learned, collective, and distinctive patterns of thinking, that structure the way a group of people think, feel, and behave in a specific social environment (Hofstede, Hofstede, & Minkov, 2010). Together with culture, cultural values as normative standards represent the most intangible characteristic of a given culture and they translate into preferences for given situations over others when experiencing emotions and feelings for what an individual may regard as, for instance, moral or immoral, good or evil, safe or unsafe (Trompenaars & Hampden-Turner, 1997). Cultural values condition behaviors, objects and goals of human beings belonging to a specific society and they can be used as a tool to explain actions performed to satisfy societal needs and requirements (Lord & Brown, 2001). Because of their independency from specific situations that any

individual faces every day, the direct analysis of cultural values has allowed researchers to conceptualize cultural differences both at the national and organizational level (Smith, Peterson, & Schwartz, 2002). For the importance assigned to the understanding of cultural diversity at the corporate level, the analysis of national cultures has often been carried out by using frameworks relating to cultural dimensions and their consequences for managerial practices (Newman & Nollen, 1996). According to the number of variables taken into account, the frameworks used have been classified into single dimension models, multiple dimension models, or historical-social models. All of them address culture as a measurable and quantifiable set of values, which are retrieved via structured questionnaires. Afterwards, the data are statistically analyzed and compared across the countries in order to assign cultural scores to specific cultural dimensions, which reflect their magnitude and direction (Morden, 1999). Cultural models are commonly applied by researchers to understand how cultural differences influence product design (Razzaghi, Ramirez, & Zehner, 2009), marketing and advertising (De Mooij & Hofstede, 2010), effectiveness of e-commerce platforms (Singh et al., 2004), and localization of multinational companies' websites (Yalcin, Singh, Apil, & Sayfullin, 2011). Among the frameworks used for the measurement of cultural values, Hofstede's has been recognized by academics as the most reliable one (Tang & Koveos, 2008). This does not mean that his study is not exempt from criticism which, for instance, points at relevancy of the methodology and the assumption regarding the cultural homogeneity of nation's populations (Jones, 2007). The cultural model proposed by Hofstede is a multiple dimension model, derived from a factor analysis of 32 questions on values and perceptions in 40 countries. The model describes culture in terms of four bipolar dimensions: Individualism and Collectivism, Power Distance, Uncertainty Avoidance, and Masculinity and Feminity (Hofstede et al., 2010). A consecutive research based on 23 countries allowed to add another dimension that focuses on the opposing long-term and short-term perspectives on life and work: Confucian dynamism or Long-Term Orientation versus Short-Term Orientation (Hofstede, Neuijen, Ohayv, & Sanders, 1990).

The world of the Web is not neutral in terms of expression of cultural values in website design and multimedia content (Singh, Zhao, & Hu, 2005). At this regard, LISA (2007) defines localization as "the process of modifying products or services to account for differences in distinct markets" (p. 11). Once transposed to online communication, apart from translation of textual content, localization of websites comprises activities such as translation and adaptation of videos and graphics to address cultural needs and preferences of specific markets. Additionally, cultural adaptation in online communication accounts for modifications of time and date formats, units of measure, icons and symbols, which are regarded as important for a better fruition of the information provided to the user (Al-Badi & Naqvi, 2009; De Troyer & Casteleyn, 2004; Singh et al., 2004). A framework to assess cultural adaptations on the Web was elaborated by Singh et al. (2005) in order to support companies in their localization strategies for the Chinese market and it proved its validity for research studies on the topic (Yalcin et al., 2011). The model makes use

of Hofstede's cultural dimensions (Hofstede et al., 2010), except for the Masculinity and Femininity dimension, and Hall's bipolar dimensions of High-Context (HC) and Low-Context (LC) cultures (Hall, 1976). The framework elaborated by Singh et al. (2005) has been adapted for the study of depiction of cultural values on tourism destination websites by Tigre Moura et al. (2015), who also excluded the dimension of Masculinity and Femininity for low reliability. Cultural studies on tourism destination websites pursue a variety of goals. However, research on localization of cultural values for marketing purposes on different-language editions of tourism destination websites is missing (Tigre Moura et al., 2015). There is also the need for an analytic method to study the depiction of cultural dimensions, which takes into consideration the flexibility and non-linearity of tourism websites architecture. This research focuses on the localization of cultural values in tourism destination websites, pursuing the goal of suggesting an analytic method to study and measure how they are depicted.

### 3 Research Design

The research analyzes the depiction of cultural values into National Tourism Organizations' (NTOs) websites and their localization for different geographical markets. The US-American and the Italian editions of three NTOs' websites were analyzed: Austrian National Tourist Office, Tourism Ireland Ltd., and Innovation Norway. These three websites were selected among others, because of their major efforts in differentiating the layout and content of the US-American edition from the Italian edition. For the scope of the research, four cultural dimensions were taken into account: Individualism and Collectivism, Uncertainty Avoidance, Power Distance, and High Context and Low Context.

Individualism (IND) and Collectivism (COL) dimension is defined as the degree to which individuals integrate into groups. While individualist cultures pay importance to personal achievements, collectivist cultures privilege group objectives and goals. United States is characterized by being one of the countries with the highest IND levels (cultural score of 91). Whereas, Italy is described as a fairly individualist country (cultural score of 76), with collectivist influences from the southern part of the nation (Hofstede et al., 1990; Hofstede et al., 2010). On this base, the first hypothesis can be formulated as follows:

*Hypothesis 1* The US-American edition of the NTO's website shows higher Individualism levels than the Italian edition of the NTO's website.

Power Distance (PD) dimension is defined as the degree to which individuals accept inequalities in the distribution of power within institutions of any kind. Countries with high PD are characterized by the acceptance of such discrepancies and inequalities in the distribution of power. While United States is characterized by low PD levels (cultural score of 40), Italy is outlined by an acceptance for

inequalities in decision making (cultural score of 50) (Hofstede et al., 2010). Consequently, the second hypothesis is as follows:

*Hypothesis 2* The Italian edition of the NTO's website presents higher Power Distance levels than the US-American edition of the NTO's website.

Uncertainty Avoidance (UA) dimension measures the extent to which individuals accept unclear and undefined situations during their life. While United States is characterized by low UA (cultural score of 46), Italy scores high on this dimension with a cultural score of 75. Therefore, the study hypothesizes as follows:

*Hypothesis 3* The Italian edition of the NTO's website presents higher Uncertainty Avoidance levels than the US-American edition of the NTO's website.

High-context (HC) and Low-Context (LC) dimensions refer to the extent to which individuals rely on the context and code of communication. Individuals belonging to HC cultures communicate in an indirect way. They often combine body language together with verbal communication. As opposite to that, LC cultures are characterized by a direct way of communication, where all verbal messages are clear and succinct. While United States is characterized by being a LC country, Italy is outlined by HC culture (Hall, 1976). The fourth and fifth hypotheses can, thus, be formulated as follows:

*Hypothesis 4* The Italian edition of the NTO's website shows more signs of High-Context communication than the US-American edition of the NTO's website.

*Hypothesis 5* The US-American edition of the NTO's website shows more signs of Low-Context communication than the Italian edition of the NTO's website.

## 4 Methodology

The study of cultural values and localization practices of NTOs' websites was carried out by combining in an innovative way (1) usability and (2) content analysis. For what regards the first point, usability is defined as the degree to which a software can be used by given users with satisfaction in order to reach given goals with effectiveness and efficiency in a specific context of use (ISO 9241-11: D 3.1, 1998). There are two main methods for usability analysis: usability inspections and empirical tests. For what regards the latter, the main method for the analysis of the multimedia content of a website are the so-called "user scenarios": realistic stories of the use of an application. A user scenario is composed by a user profile, user goals (i.e. the intended outcome), and the actions required to reach such goals (Cantoni, Di Blas, & Bolchini, 2003). Thus, three user scenarios (identical for both the US-American and Italian websites' editions), with a mean of 13 tasks each, were elaborated to simulate realistic navigational patterns of NTOs' websites by online visitors from the US-American and Italian-speaking geographical markets.

For what regards the website of Innovation Norway the goals of the user scenarios were as follows:

- Find the must-see attractions in Oslo
- Find a museum to visit in Oslo about the artist Edward Munch
- Book a hotel for two adults and a child in Oslo for the following time: 10th–15th of August 2015
- Find information about driving regulations, weather, and currency in Norway
- Find information on guided tours in Bergen

For the website of Tourism Ireland Ltd.’ the goals of the user scenarios were as follows:

- Find a page about attractions in Dublin
- Book a double room in a hotel in Dublin for the following time: 10th–15th of August 2015
- Find information about driving regulations, weather, and currency in Ireland
- Find information about Tour Operators that organize golf activities in Ireland
- Find a page dedicated to the Fermanagh Lakelands

For the website of Austrian National Tourist Office the goals of the user scenarios were as follows:

- Retrieve information on top attractions in Vienna
- Find out if there is an event in the city of Vienna or its surroundings happening by the following time: 10th–14th of August 2015
- Book a double room in a hotel in Vienna for the following time: 10th–14th of August 2015
- Retrieve information about driving regulations, climate, and currency in Austria
- Purchase a wine and gourmet package
- Retrieve contact information for Spas in Tirol

For what regards the second point, each landing page visited while executing the user scenario was analyzed following an adaptation (written in *italics*) of the framework for the evaluation of cultural values on tourism destination websites (see Table 1) proposed by Tigre Moura et al. (2015). Moreover, differently from the evaluation used by Tigre Moura et al. (2015), which included the value “not depicted”, for this study each element that would fall into one of the Cultural Categories was classified along a 5-point Likert scale from “scarcely depicted” to “prominently depicted”. Those Cultural Categories with no associated values were classified as “not found” and they were excluded from the overall mean. The choice was motivated by the fact that the analytical method used did not cover all the pages of the tourism websites and, therefore, it would have been inappropriate to classify an element as “not depicted” (when instead it could have been represented in one or more pages that were not taken into consideration). For the assessment of cultural values, the study employed the criterion of repetition, borrowed from Tigre Moura et al. (2015), and added a second and a third criterion called “relative size” and “positionality prominence” respectively. The criteria were articulated as follows:

- *Relative size*: The relative dimension of a text box, picture or video when compared to the relative dimension of those elements that fall within the same multimedia content categories. Thus, the text boxes present on the websites were classified in order of relative size from the biggest to the smallest ones and then assessed against a 5-point Likert scale. The same procedure was then carried out for images and videos, which were considered as belonging to the same multimedia content category.
- *Repetition*: A numerical value was assigned every time an element belonging to a specific Cultural Category would appear. Afterwards, a sum of the values was made and measured along a 5-point Likert scale.
- *Positionality Prominence*: This criterion derived from the assumption that the more a given element was shown in the upper part of the webpage, the more importance it was considered to have for achieving the website's communication purposes. Webpages were divided horizontally in five geometrically equal areas and decreasing grades were assigned from a 5-point Likert scale to the elements belonging to each area from the top to the bottom of the page (representing "5" and "1" respectively). Those elements that were between two areas would get the grade of the first upper area to which they belonged.

User scenarios were applied also to analyze some cultural elements not taken into account by the framework proposed by Tigre Moura et al. (2015), which were: currency, units of measure and calendars. The localization of such elements was assessed for both editions of the websites (Al-Badi & Naqvi, 2009; De Troyer & Casteleyn, 2004; Singh et al., 2004).

## 5 Results

In order to measure the depiction of cultural values for the US-American edition and Italian edition of the sampled tourism websites, two realistic stories were developed for each website. In order to avoid affecting the validity and comparability of the results, the goals of the user scenarios were identical for both the US-American and Italian-speaking geographical markets. This inspection method was used as a structured pattern to find and report all the multimedia content that would belong to any of the categories that form the Cultural Dimensions analyzed. For data collection, adaptations (written in *italics*) were done to the framework used by Tigre Moura et al. (2015) in order to make it suitable for the websites analyzed. In the grid of the results (see Table 2), the countries representing the NTOs are abbreviated as follows: Austria (AT), Ireland (IE), and Norway (NO). Whereas, the editions are abbreviated as follows: US-American edition (USA) and Italian edition (IT).

The results indicated that the US-American editions of the three sampled websites scored higher in IND than the respective Italian editions. For instance, the US-American edition of the Norwegian NTO's website would highlight the



uniqueness of the fjords, stunning landscapes, culinary tradition, and special accommodation solutions in combination with plenty of sport-related activities in contact with nature. A similar focus on exclusivity and exceptionality of the tourism experience was found also in the other sampled websites. Therefore, hypothesis 1 was confirmed.

The Italian editions of the websites of Austrian National Tourist Office and Innovation Norway scored higher in PD than the respective US-American editions. Whereas, the Italian edition of Tourism Ireland Ltd.'s website scored lower than the US-American edition in PD. More in particular, while executing the user scenario, the US-American edition of the Irish NTO's website would provide richer information about international celebrities (like the group U2) and famous writers (like James Joyce) than the respective Italian edition. Therefore, hypothesis 2 was partially confirmed.

The Italian editions of the three sampled websites scored higher in UA than the respective US-American editions. For instance, while executing the user scenario, the Italian edition of the Austrian NTO's website showed a finer granularity of information regarding accommodation, transportation, and restoration solutions (thus decreasing uncertainty) than the respective US-American edition. A similar situation was found also for the other sampled websites. Therefore, hypothesis 3 was confirmed.

The Italian editions of the sampled websites scored higher in HC than the respective US-American editions. For instance, the user scenario for the Italian edition of the Norwegian NTO's website revealed a communicative style that was richer in suggestions formulated with modal verbs (to express the possibility to do an activity) than the respective US-American edition. Moreover, the user scenarios revealed that all the Italian editions would have a strong focus on text and images reflecting the concept of harmony, which was intended as correspondence and accord with family members, animals, or nature in general (Oxford University Press, 2003, p. 305). Therefore, hypothesis 4 was confirmed.

The US-American edition of Tourism Ireland Ltd.'s website scored higher in LC than the respective Italian edition. Whereas, the US-American editions of Austrian National Tourist Office's website and Innovation Norway's website scored lower than the respective Italian editions. In general, the user scenarios for the three sampled websites showed that the Italian editions were focusing more on special deals and money-saving advices than the respective US-American editions. Therefore, hypothesis 5 was confirmed only by one out of three websites.

For what regards the localization practices in the three sampled tourism websites, the user scenarios highlighted the adaptation of prices for the respective geographical markets of reference and the addition of a section for VISA and passport regulations for the US-American editions, which was absent for the Italian editions. More specifically, since Austria, Ireland, Norway, and Italy are part of the Schengen Visa agreement, there is no passport and immigration control at their joint borders (SchengenVisaInfo.com, 2015). In addition to that, Innovation Norway's website adapted units of measure for indicating distances and temperature degree for the US-American and Italian editions. Depending the edition

selected, the Austrian National Tourism Office's website presented different calendars for the booking section: the US-American, which starts on Sunday and finishes on Saturday, and the European one, which starts on Monday and finishes on Sunday. Finally, according to the edition selected, the search engine of the Austrian National Tourism Office's website would respond to names of cities inserted either in Italian or English. For instance, when the word "Salisburgo" was inserted in the Italian edition, the booking engine would recognize it immediately as the Austrian city "Salzburg". The same was true for the US-American edition, where the booking engine would recognize the word "Vienna" as the Austrian capital "Wien".

## 6 Conclusions, Limitations, and Further Work

In this paper a methodology has been defined in order to assess localization activities present in destinations websites. Such framework encompasses user scenarios execution and a content analysis following the cultural dimensions of Hofstede et al. (2010) and Hall (1976), which were integrated also by Tigre Moura et al. (2015). The study performed on three major European NTOs' websites has confirmed most of the hypotheses originated from Hofstede's et al. (2010) model and one hypothesis from Hall's (1976) cultural studies. The analysis stresses the fact that particular attention has been devoted by content managers to localizing specific elements in their websites in order to meet the cultural background of the intended audience while promoting the destination.

Among limitations of this exploratory study, it should be noted that only three NTOs websites were analyzed, being characterized by clear localization practices. Additionally, contents were coded by only one person. Further investigation is needed to refine the cultural framework used as well as to approach more websites, including those whose localization activity appears to be much less important. Moreover, it will be instrumental to assess the internal procedures and goals held by NTOs when it comes to localization of their websites, as well as the impact (measured in terms of effectiveness and efficiency) of localization practices when it comes to end-users belonging to different referenced cultures. By doing so, a larger basis of analysis will be provided, which is highly needed, not only to better study scientifically or academically the issue, but also to offer guidelines for practitioners and developers of destination websites.

## Annexes

**Table 1** Proposed adaptation of the cultural framework for the evaluation of cultural values on tourism destination websites.

Cultural dimension	Cultural categories	Operationalization
Collectivism	Community relations	<i>Presence of</i> sustainable tourism activities, activities relating to involvement of the local community; an emphasis on social responsibility
	Clubs or chat rooms	<i>Presence of</i> member's clubs, chat with destination agents, chat with interest groups, message boards, discussion groups and live talks, social network sites
	Family theme	Pictures of families, pictures of teams of employees, groups of tourists, emphasis on team and group activities and tourists as a family
	Newsletter	Online subscriptions, magazines, and newsletters
Individualism	Independence theme	Images and themes depicting self-reliance, self-cognition, achievement, isolation and self-fulfillment
	Uniqueness of the destination	Emphasis on the unique features and differentiating aspects of the destination
	Personalization	Features such as attractions recommendations and <i>accommodation experience recommendations</i> , individual acknowledgements or greetings from the destination, travel planners, <i>tour operators</i> , web page personalization, and customized travel packages
Power distance	Destination hierarchy info	Information about destination managers, politicians, local government or administration and hierarchy of the tourism sectors
	Pictures of celebrities	Pictures of important people related to the destination and titles of the people in the contact information
	Proper titles	Titles of the important people related to the destination and titles of the people in the contact information
	Vision statement	Statement about the destination from destination managers or people who represent power in the society
Uncertainty avoidance	Customer service	FAQs, tourist service, tourist contact, tourist service emails and toll free numbers available 24 h
	Tradition theme	Emphasis on history, emphasis on respect, veneration of elderly and the culture, and phrases like "most respected destination", "keeping the tradition alive", "for generations", etc.
	Local services	Contact information for local tourism-related companies such as hotels, travel agencies, <i>tour operators</i> , restaurants, and others; also contact information for personal safety services, such as police and hospitals
	Visualization of the place	Maps of the destination and reference to geographical localization, virtual tours, live webcams, weather charts, etc.
	Local terminology	Use of country-specific metaphors, name of festivals, puns, a general local touch in the vocabulary of the web page

(continued)

**Table 1** (continued)

Cultural dimension	Cultural categories	Operationalization
High context	Aesthetics	<i>Attention to aesthetic details such as: currency, textual correctness, plug-ins and links, redundancy, and responsive webpage</i>
	<i>Feelings and emotions</i>	<i>Pictures and themes reflecting love and harmony appeal</i>
	Politeness and indirectness	Greetings from the destination, images and pictures reflecting politeness, and use of indirect expressions like “perhaps”, “probably”, and “somewhat”; overall humbleness of in the destination philosophy and information
	Soft sell approach	Use of affective and subjective impression of intangible aspects of a product or service and more entertainment theme to promote the destination
Low context	Hard sell	Discounts, promotions, coupons, and emphasis on products and services advantages using explicit <i>or implicit</i> comparison
	Rank or prestige of the destination	Features like destination’s rank in the country, listings, and numbers <i>or text</i> showing the growth and importance of the destination
	Use of superlatives	Use of superlative words and sentences: like “we are the number one”, “the most visited destination”, “the leader”, and “world’s most famous”

**Table 2** Means of cultural dimensions and cultural categories

Cultural Dimensions	Representation on Website	Mean AT_usa	Mean AT_it	Mean IE_usa	Mean IE_it	Mean NO_usa	Mean NO_it
COL	Community relations	2.90	2.38	3.24	3.38	3.51	3.01
	Clubs or chat rooms	2.58	2.66	1.89	2.09	2.04	2.25
	Family theme	3.72	3.38	4.00	3.72	3.27	3.32
	Newsletter	1.15	1.52	2.48	2.16	1.46	1.69
		<b>2.59</b>	<b>2.49</b>	<b>2.90</b>	<b>2.84</b>	<b>2.57</b>	<b>2.57</b>
IND	Independence theme	3.67	3.73	3.54	3.81	3.23	2.92
	Uniqueness of the destination	3.89	1.94	3.90	3.90	3.82	3.40
	Personalization	3.48	2.79	3.83	3.34	3.85	3.76
		<b>3.68</b>	<b>2.82</b>	<b>3.76</b>	<b>3.68</b>	<b>3.63</b>	<b>3.36</b>
PD	Destination hierarchy info	3.04	3.36	2.17	1.42	1.83	2.12
	Pictures of celebrities	2.47	3.21	3.09	2.79	2.46	2.79
	Proper titles	n.f.	3.67	3.72	3.46	2.11	2.26
	Vision statement	n.f.	n.f.	n.f.	n.f.	n.f.	n.f.

(continued)

**Table 2** (continued)

Cultural Dimensions	Representation on Website	Mean AT_usa	Mean AT_it	Mean IE_usa	Mean IE_it	Mean NO_usa	Mean NO_it
		<b>2.76</b>	<b>3.41</b>	<b>2.99</b>	<b>2.56</b>	<b>2.14</b>	<b>2.39</b>
UA	Customer service	1.78	2.48	1.61	2.72	1.41	1.88
	Tradition theme	2.95	3.28	3.28	3.21	2.91	3.10
	Local services	2.40	3.15	3.76	3.83	3.87	3.77
	Visualization of the place	3.11	3.11	2.23	1.75	4.14	3.94
	Local terminology	2.63	2.04	2.68	3.11	2.92	3.39
		<b>2.57</b>	<b>2.81</b>	<b>2.71</b>	<b>2.92</b>	<b>3.05</b>	<b>3.22</b>
HC	Aesthetics	3.00	4.00	3.00	4.00	3.00	4.00
	Feelings and emotions	2.60	3.68	3.07	2.98	2.66	2.85
	Politeness and indirectness	2.38	3.67	1.82	n.f.	1.41	2.59
	Soft sell approach	3.02	2.96	3.72	3.18	3.52	2.85
		<b>2.75</b>	<b>3.58</b>	<b>2.90</b>	<b>3.39</b>	<b>2.65</b>	<b>3.07</b>
LC	Hard sell	2.90	3.76	2.88	3.06	2.60	2.88
	Rank or prestige of the destination	2.75	n.f.	2.72	1.79	1.56	1.62
	Use of superlatives	3.82	2.83	3.93	3.83	3.62	3.72
		<b>3.16</b>	<b>3.30</b>	<b>3.18</b>	<b>2.89</b>	<b>2.59</b>	<b>2.74</b>

## References

- Al-Badi, A., & Naqvi, S. (2009). A conceptual framework for designing localization business websites. *Journal of Management and Marketing Research*, 113–120.
- Cantoni, L. (2012). Cultura, Educazione e Fede. Presentazione. In C. Dawson (Ed.), *La crisi dell'istruzione occidentale* (pp. 7–16). Rende, CS: D'Attoris Editori.
- Cantoni, L., Di Blas, N., & Bolchini, D. (2003). *Comunicazione, qualità, usabilità*. Milano: APOGEO.
- Cappelli, G. (2008). The translation of tourism-related websites and localization: problems and perspectives. *Voices on Translation, RILA Rassegna Italiana di Linguistica Applicata*, 97–115.
- Cyr, D., & Trevor-Smith, H. (2004). Localization of web design: An empirical comparison of German, Japanese, and U.S. Website characteristics. *American Society for Information Science and Technology*, 55(13), 1–10.
- De Mooij, M., & Hofstede, G. (2010). The Hofstede model: Applications to global branding and advertising strategy and research. *International Journal of Advertising*, 29, 85–110.
- De Troyer, O., & Casteleyn, S. (2004). Designing localized Web Sites. *5th International Conference on Web Information Systems Engineering (WISE2004)* (pp. 547–558). Brussel: Springer.
- Hall, E. T. (1976). *Beyond culture*. New York: Anchor Books.
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind. Revised and expanded* (3rd ed.). New York: McGraw-Hill.
- Hofstede, G., Neuijen, B., Ohayv, D. D., & Sanders, G. (1990). Measuring organizational cultures: A qualitative and quantitative study across twenty cases. *Administrative Science Quarterly*, 35, 286–316.

- ISO. (1998). *ISO 9241-11:1998*. Retrieved from ISO: <https://www.iso.org/obp/ui/#iso:std:iso:9241:-11:ed-1:v1:en>
- Jones, M. L. (2007). Hofstede—culturally questionable? *Oxford Business & Economics Conference*, (pp. 1–9). Oxford.
- Law, R., Buhalis, D., & Cobanoglu, C. (2014). Progress on information and communication technologies in hospitality and tourism. *Information and Communication Technologies in Hospitality and Tourism*, 26, 727–750.
- LISA. (2007). *The Localization Industry Primer. An introduction to preparing your business and products for success in international markets*. Romainmôtier: Localization Industry Standards Association.
- Lord, G. R., & Brown, J. D. (2001). Leadership, values, and subordinate self-concepts. *The Leadership Quarterly*, 12, 133–152.
- Morden, T. (1999). Model of National Culture—A management review. *Cross Cultural Management: An International Journal*, 6, 19–44.
- Newman, L. K., & Nollen, D. S. (1996). Culture and congruence: The fit between management practices and national culture. *Journal of International Business Studies*, 27, 753–779.
- Oxford University Press. (2003). *Oxford student's dictionary* (5th ed.). Oxford: Oxford University Press.
- Razzaghi, M., Ramirez, M., & Zehner, R. (2009). Cultural patterns in product design ideas: Comparisons between Australian and Iranian student concepts. *Design Studies*, 30, 438–461.
- SchengenVisaInfo.com. (2015). *Schengen Visa Countries List*. Retrieved from schengenvisa.info.com: <http://www.schengenvisa.info.com/schengen-visa-countries-list/>
- Singh, N., Furrer, O., & Ostinelli, M. (2004). To localize or to standardize on the Web: Empirical evidence from Italy, India, Netherlands, Spain, and Switzerland. *The Multinational Business Review*, 12, 69–87.
- Singh, N., Zhao, H., & Hu, X. (2005). Cultural adaptation on the Web: A study of American Companies' Domestic and Chinese Websites. *Advanced Topics in Global Information Management*, 4, 203–220.
- Smith, B. P., Peterson, F. M., & Schwartz, H. S. (2002). Cultural values, sources of guidance, and their relevance to managerial behavior. *Journal of Cross-Cultural Psychology*, 33, 188–208.
- Tang, L., & Koveos, E. P. (2008). A framework to update Hofstede's cultural value indices: Economic dynamics and institutional stability. *Journal of International Business Studies*, 39, 1045–1063.
- Tigre Moura, F., Gnoth, J., & Deans, K. R. (2015). Localizing cultural values on tourism destination Websites: The effects on users' willingness to travel and destination image. *Journal of Travel Research*, 54, 528–542.
- Trompenaars, F., & Hampden-Turner, C. (1997). *Riding the waves of culture: Understanding diversity in global business*. London: Nicholas Brealey Publishing.
- Wallerstein, I. (1990). Culture as the ideological battleground of the Modern World-System. *Theory, Culture & Society*, 7, 31–55.
- Yalcin, S., Singh, N. D., Apil, R. A., & Sayfullin, S. (2011). Culture and localization on the Web: Evidence from multinationals in Russia and Turkey. *Journal of Electronic Commerce Research*, 12, 94–114.

# Social CRM Capabilities and Readiness: Findings from Greek Tourism Firms

Marianna Sigala

**Abstract** Technological advances and consumer behaviour changes are transforming CRM from a transactional to a conversational approach (called social CRM) that empowers customers as relationships' co-creators. Limited research has examined the firms' capabilities required to effectively integrate social media into CRM. To address this gap, a literature review produced a preliminary list of social CRM capabilities which was further refined and enriched by collecting data from the Greek tourism industry. Findings from various stakeholders (tourism professionals, scholars and IT vendors) and sources (observations, documents, job descriptions) produced a thorough list of social CRM capabilities and revealed the social CRM readiness of Greek tourism firms. The following capabilities are discussed: organisational culture and management, information resource management, information technology infrastructure, business strategy, customer-centric processes, communication, performance measurement.

**Keywords** Social CRM • Social media • Tourism • Capabilities, readiness • Capacity building needs

## 1 Introduction

Social media and their subsequent effects on changing consumer behaviour have contributed in transforming and revolutionalising the ways in which customer relationships can and should be managed (Bowen & McCain, 2015; Küpper, 2014; Malthouse, Haenlein, Skiera, Wege, & Zhang, 2013; Sigala, 2011). Social media have changed the way people interact with each other, with the companies and the institutions, as well as have empowered the customer to own and control the conversation. The firms are no longer in control of the customer relationship; instead, individual customers and virtual communities are now driving the conversation and influence the brand image and relations (Dessart, Veloutsou, & MorganThomas, 2015). This significantly determine the company's efforts to provide personalised experiences and build customer relationships. The social

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customers is also not interested anymore in getting solely transactional benefits from their companies' relations (Bowen & McCain, 2015), expect to get personalised customer service and information at any device, any place and any time (Sigala, 2015), and they become strong brand advocates when customer satisfaction is achieved. On the other hand, technologies enable the firms to faster and more effectively collect, analyse and use customer intelligence for better learning the customer and providing personalised interactions through the entire customer life cycle (Küpper, Lehmkuhl, Jung, & Wieneke, 2014). Realising the impact and potential of social media, firms are increasing their investment on social CRM technology (spending increased by more than 40 % in 2010 and it exceed \$1 billion in 2013, Sarner et al., 2011). Yet, despite the current hype surrounding social media, the efficacy of social CRM technology remains unknown and underexplored and so, it is not surprising that 11 % of firms do not have a formal social CRM strategy (Küpper et al., 2014).

There is an urgent need to transform the traditional CRM, that focuses on managing the *customer transactions* during the whole customer life cycle, to a social CRM or CRM 2.0, which places emphasis on the personalisation and management of *customer experiences and interactions*. However, although a theoretical debate about the drivers, the definition and the scope of the social CRM has already started, the literature has failed to thoroughly examine the organisational capabilities and processes that the firms should develop and possess for effectively exploiting the social media and implementing social CRM (Malthouse et al., 2013). Consequently, research and practice are encountering problems implementing social CRM successfully, due to the fact that the processes, the capabilities and the tools required for developing a social CRM strategy have not been clearly structured and defined yet (Küpper, 2014). This is also true in tourism, whereby the firms' CRM is now not only outdated, but also unable to exploit the affordances of the new technologies and to appeal to the needs of the Millennials (Bowen & McCain, 2015; Mayock, 2014).

To address this gap, the paper reviews the limited but emerging literature on social CRM in order to develop a list of capabilities that firms need to possess for effectively implementing social CRM strategies. The list of social CRM capabilities was further refined and expanded by conducting in depth interviews with a sample of Greek hotel and tourism managers, IT-suppliers and tourism scholars. The interviews also aimed at investigating the readiness of Greek tourism firms to embark on a social CRM strategy and orientation. Thus, the findings provide useful insight into the social CRM training and capacity building needs of the industry. Finally, the practical and theoretical implications of the findings are also discussed.



## 2 Social Customer Relationship Management: Aims and Tenets

Despite the plethora of CRM programmes in hospitality, many of them have failed to create customer attention and attitudinal loyalty (Berezan, Raab, Tanford, & Kim, 2015), because they mainly provide “me-too” offers of commoditised rewards to repeat purchases that treat customers as interchangeable commodities and bar-code numbers (Weissenberg, Katz, & Narula, 2013). This is confirmed by research findings showing the multiplication of customer loyalty to numerous loyalty programmes and the inability of loyalty/CRM programmes to significantly influence customer hotel choice and purchase behaviour (Sigala, 2015). Many CRM programmes have failed to deliver their promised business benefits. Moreover, hospitality firms need to urgently revisit and update the design and structure of their CRM strategies, as their value propositions do not any more appeal to the new Millennials (Bowen & McCain, 2015; Greenberg, 2011), who: seek more personalised experiences, flexibility and variety (Sigala, 2011); rate ‘ability to value me’ and ‘ability to understand My needs’ as the most important attributes in creating loyalty (Weissenberg et al., 2013); and, are always connected for sharing, communicating and engaging with peers and social networks by using various technological devices in all aspects of their daily life. The social media have also introduced new customer-centric tools that empower customers to interact with others and with businesses for exchanging (informational, cultural, social and economical) resources and co-creating value in various ways (e.g. electronic word-of-mouth, crowdsourcing, innovation, reputation building) (Sigala, 2011). Trainor, Andzulis, Rapp, and Agnihotri (2014) identified four functional building blocks of social media that significantly influence the concept and implementation of CRM:

*Conversation*: applications expediting a company’s dialog with and between their customers and capturing the data from these conversations.

*Sharing*: social media leveraging how users create, exchange and receive content

*Groups*: tools assisting the building and nurturing of online user communities focusing on specific topics, brands, or products

*Relationships*: tools allowing firms and customers to create networks of associations with various users and firms utilize this information retrieved from these networks

Social media provide the firms with the tools to more effectively engage and co-create value with customers and their communities. The collaborative activities afforded by social CRM technologies move customer relationships towards a process of engaging rather than managing people (Greenberg, 2010) for co-creating value within the customer’s ecosystem whereby all the stakeholders are viewed as value creators. Firms are also better equipped to obtain a more holistic picture of the customers and their networks, as social media can capture the whole networked customer-ecosystem consisting of numerous many-to-many

customer relationships. These developments reveal the limitations of the traditional CRM approach, which views the customer as the individual decision-maker of purchases and who generates firm value solely through consumption and purchase behaviour. Hence, firms have to develop customer relations in different ways that go beyond the one-to-one relationship management approach between companies and their customers and evolve from a transactional to a conversational relationship building mindset (Acker, Gröne, Akkad, Pötscher, & Yazbek, 2011).

To appeal to the independent, social and self-sufficient customer, CRM programmes have to revisit the ways in which they interact, engage with and reward customers for their loyalty and their value generating activities. As customers increasingly use self-service technologies not because they wish to avoid humans and human interaction, but because they want to avoid human error, firms have to re-think how they can exploit and integrate the affordances of the new technologies into CRM strategies for providing reliable, valuable and personalised customer interactions and experiences.

Indeed, technological advances are driving a transformation of the CRM named as, CRM 2.0 or social CRM (Diffley & McCole, 2015; Malthouse et al., 2013). This CRM evolution reflects a strategic shift and focus towards enhancing and personalising both the customer transactions and the customer interactions by exploiting the informational, communication and networking capabilities of the new technologies (Baird & Parasnis, 2011; Greenberg, 2010; Sigala, 2011). The 2.0 revamp of the CRM requires the existence of a fundamentally different customer paradigm, but at the same time recognizes the need to continue the operational and transaction-based capabilities of CRM. As the technologies give customers the control of the relationships, several authors have recognised the need to change the scope and the aim of the CRM from relationship management to relationship stewardship.

The following definitions of social CRM also highlight these transformational needs requiring the firms to consider the customer as a collaborator and actively engage him/her in relationship building and development processes. For example, Greenberg (2010) defined social CRM as the business strategy of engaging customers through the social media with the goal of building trust and brand loyalty, while Lehmkuhl (2014, p. 67) as *'a holistic and cross-functional approach supported by strategies, technologies, processes, corporate culture and social characteristics . . . to involve customers and other connected web-users in interactions on firms' managed Social Media profiles and platforms as a means of providing mutually beneficial value'*.

The conceptualisation of social CRM is still emerging and being debated, as it is dynamically and continually affected by the new technology advances and customer trends. Hence, a widely accepted definition of social CRM can be found in a research-based wiki (<http://crm20.pbwiki.com>), because the wiki enables numerous researchers to continually discuss, contribute, update and co-agree on the conceptualisation of CRM 2.0. This collaboratively developed definition shows that there is a general consensus that CRM 2.0 is a *"philosophy and a business strategy, supported by a technology platform, business rules, processes and social*

*characteristics, designed to engage the customer in a collaborative conversation in order to provide mutually beneficial value in a trusted and transparent business environment"*. Apart from recognising the technology (and specifically, the social media and the networking/communication tools) as a major enabler of social CRM, this definition also highlights that the social CRM: (1) considers the customer as a value co-creator, partner and collaborator; (2) depends on the use of the customer resources (such as, customer-generated-data and insights) as important resources for value co-creation; and so, (3) is designed to enable the customers to participate and get engaged in mutual beneficial value co-creation processes with the firm. Hence, the social CRM adopts a value co-creation approach that aims to support the collaborative development and management of relations within the customer ecosystem consisting of various stakeholders (i.e. business partners, customers, suppliers, customer communities) who interact, exchange and integrate resources for co-creating value. Because of that, in contrast to CRM 1.0 that focuses on products/services and the firms' value creation processes, the social CRM centres on: the customers' experiences and value co-creation processes; the context/networked customer ecosystem whereby co-creation takes place; and the ecosystem stakeholders' interactions facilitating resource exchanges for value co-creation. Thus, the social CRM is in line with a co-creation approach recognising that value is not pre-produced and embedded within products/services, but instead value is co-created through actors' interactions. In this vein, the social CRM emphasises the need to design, manage and oversee value co-creation interactions amongst the various ecosystem actors. To that end, instead of managing customer relations for generating business value, the management priority and challenges of social CRM are how to manage and motivate customer engagement for ensuring that customers participate in value co-creation activities within their ecosystem. Hence, the design and the management of the customer ecosystem, the actors' interactions and dialogues also become at the core of the social CRM. Based on this value co-creation perspective, the social CRM also demands the development of a broader understanding of customer value that should not anymore be limited to purchased transaction based Customer Lifetime Value concepts, but it should also include the social, emotional, cognitive and symbolic aspects of customer value (e.g. value of customer influence, referrals and knowledge) that can be generated throughout the customer participation in various value co-creation activities throughout the whole business value chain processes (e.g. in new product development, promotion, customer service) and not only transactions.

Overall, firms wishing to implement social CRM should: (1) treat and consider their customers and customer communities as value co-creators and relationship co-managers; (2) create and support value co-creation processes and interaction opportunities in which the customers would be willing, be motivated, rewarded and skilled to participate with the purpose to exchange/integrate resources for co-creating value with the firm, other customers and/or customer communities; and (3) adopt a broader definition of customer value that recognises the value co-creation role of customers beyond the transactions processes and use this

value conceptualisation for evaluating, segmenting and motivating customers to engage in value co-creation.

### 3 Social Customer Relationship Management Capabilities

Given the affordances of the social media to informate the customer relationship building practices of firms, early studies adopted a relational information process approach for exploring the firms' capabilities in implementing social CRM. For example, Faase (2011) defined a social CRM capability as a firm's competency in generating, integrating, and responding to information obtained from customer interactions that are facilitated by social media technologies. Later studies have also adopted a technology orientation for investigating social CRM capabilities. For example, Trainor et al. (2014) defined the social CRM capabilities as a company's competencies in developing, incorporating, and responding to information gathered from customer interactions that are expedited through the use of social media and divided them into three dimensions: information generation, information dissemination, and responsiveness. Similarly, after reviewing the literature and conducting a market study of the social CRM technology functionality provided by 40 IT vendors, Küpper et al. (2014) developed and validated a list of social technology features consisting of six dimensions: monitoring and capturing; analysis; exploitation; IS integration; communication; management.

However, being a business strategy rather than a simple technology application or extension of CRM, social CRM implementation requires more than social technology resources and technology exploitation capabilities. Social CRM demands a holistic "transformational efforts among all organizational parts", substantial organisational changes and/or an appropriate organisational culture (Sigala, 2011). Moreover, as the social CRM aims to utilize social media to encourage active customer engagement (Sigala, 2015), firms also need to adopt a customer-centric approach in exploiting and integrating technology systems into organisational processes in order to develop a capability of customer engagement that stresses the required change in communication between businesses and customers. Thus, to effectively implement social CRM, firms need to develop a social CRM capability that should be viewed as "*the integration of traditional customer-facing activities, including processes, systems, and technologies with emergent social media applications to engage customers in collaborative conversations and enhance customer relationships*".

A social CRM capability is widely considered (Trainor et al., 2014) as a unique combination of emerging technological resources and customer centric management systems (defined as the degree to which firms tailor their business processes and systems toward serving customers), that can lead to customer satisfaction, loyalty, and retention. Thus, to investigate the required social CRM capabilities, Trainor et al. (2014) argued the need to combine a traditional view on CRM

**Table 1** Social CRM capabilities

Social CRM capability	Components
Culture	<ul style="list-style-type: none"> <li>• Open minded culture</li> <li>• Management commitment</li> <li>• Integration of back-office functions</li> <li>• Customer centric communication</li> </ul>
Information management	<ul style="list-style-type: none"> <li>• Social media / CRM applications</li> <li>• Social CRM IT infrastructure</li> <li>• Social CRM data management</li> </ul>
Internal business processes	<ul style="list-style-type: none"> <li>• Strategy and added value</li> <li>• Co-operations</li> <li>• Governance</li> <li>• Value proposition</li> </ul>
Customer oriented processes	<ul style="list-style-type: none"> <li>• Consistent / seamless customer experience</li> <li>• Customer engagement</li> <li>• Trigger-based actions</li> </ul>

resources, capabilities and processes with the new customer-centric technologies and processes for SCRM. A capabilities-based perspective on SCRM was advocated again later by Trainor et al. (2014, p. 1201) who identified four social CRM capabilities (Table 1) and who also highlighted the need for further academic research on the conceptualization and measurement of social CRM capabilities.

## 4 Research Methodology

The study aimed at identifying the social CRM firm capabilities for investigating the readiness of Greek tourism firms in embarking and successfully implementing a social CRM strategy. To that end, a preliminary list of social CRM capabilities was compiled by reviewing the limited available literature. The social CRM capabilities were further refined, tested and expanded by conducting in depth interviews with a variety of key informants including: 12 hotel managers; 10 managers of tourism firms (i.e. 5 travel agents, 3 tour operators and 2 airline managers); 4 tourism scholars; and 8 IT-suppliers. Triangulation was used to ensure the reliability and validity of the research methodology by: using various sources and methods of data collection (in depth interviews, various documents e.g., job descriptions, brochures describing the functionality of technology solutions, flyers and websites of IT-suppliers).

The interview protocol and data collection methods adopted the Trainor et al. (2014) framework of social CRM capabilities, because of its holistic approach in combining technology and organisational capabilities. This framework was also selected, as its dimensions were also recently confirmed by Küpper et al. (2015) whose study showed that social CRM performance needs to be assessed based on

the firms' capacity to achieve outcomes in the following social CRM performance dimensions: infrastructure, process, customer and organizational performance. Each interview lasted for about 1 h. The questions were semi-structured with questions built around (sub)-themes related to Trainor et al.'s (2014) social CRM capabilities.

Data analysis was underpinned by a general analytical framework based on two key stages: identification of emerging themes and analysis of shared themes. Data analysis started with some general categories using headings describing broadly what was contained in paragraphs as an initial coding scheme without being content specific, while relations among headings were also recorded. Next, the data was revisited to examine relationships between the shared themes and decide whether the merge of any different concepts would further reduce data and enhance focus on main concepts.

## **5 Findings**

Seven categories of shared themes denoting social CRM capabilities across informants were identified. Informants were also asked to share their perspectives about the current social CRM capability level and readiness of tourism firms.

### ***5.1 Organisational Culture and Management***

The importance of having an organisational structure with a strong customer orientation and open mind attitude was highlighted by all interviewees. Openness to new ideas and use of new technologies was reported as a major factor influencing the creativity of the firms to develop innovative and interactive customer engagement initiatives. Simultaneously, many tourism professionals also recognised their duty to provide appropriate and sufficient support and resources to their staff allowing them to exploit social media for CRM practices. Financial support, commitment and understanding of the potential of new technologies by the top management were also reported as critical firm capabilities by the IT vendors, since the latter have been facing several problems persuading tourism professionals to invest on new technologies specifically because it is difficult to prove or measure the business impact of such investments. Tourism scholars also mentioned that management commitment is also crucial, because oftentimes tourism managers cannot understand that staff using social media is not a 'waste of time' or 'entertainment' but an investment for customer service, learning and engagement. Overall, despite the unanimous agreement of all respondents of this critical social media capability, many of them also reported that several tourism firms still view social media applications with suspicion, negative attitude and risk due to security and privacy concerns as well as issues related to the authenticity and reliability of online

social media profiles and content. Thus, few informants also recognised the firms' ability to address such attitudes and change organisational culture as a critical social CRM capability.

## ***5.2 Information Resource Management***

Informants identified two major information resources for which firms need to develop management capabilities: social media applications and social media data. All informants highlighted that the firms have to possess the competencies on exploiting the various types of social media (i.e. networking, content sharing, content creation tools etc.) in order to provide the customers with: various touch points through which firms can more interactively communicate with customers and their communities at any time and any device; enrich the customer experiences; design opportunities of value co-creation and customer engagement in business processes; and provide customer access to various front-office operations, such as: bookings, customer information and service, customer support, brand communities, promotion/marketing, customer complaint management. The majority of the informants also recognised that firms have to develop capabilities in developing, managing and monitoring their social profile and image in social media platforms. To achieve the previous, the following critical capabilities for exploiting social media applications were also reported: conversation nurturing and facilitation (through blogs, online conferencing/webinars, online chatting, live interactive broadcasting); content creation and sharing/distribution; groups/community nurturing and support; networking and relationship building; online image development and monitoring. It was only the IT suppliers and one tourism scholar who also reported the need to develop a capability in exploiting social media tools for developing back-office operations such as, new product development, internal communication, customer profiling and segmentation, environmental scanning and market intelligence.

All informants were aware of the affordances of social media to capture more holistic data about the customers, their networks/friends and context of experiences. Hence, all of them highlighted that firms have to develop enhanced information resource management abilities that would enable them to: collect, monitor, analyse and use customer and market data for responding to customer needs and informing their business actions. However, although tourism professionals declared that they do possess some social media tools and abilities to collect and use aggregate demand data, they reported an inability to collect and monitor individual customer data as well as an ability to monitor and analyse social media data on real time for instantly addressing customer demands and complaints. IT vendors highlighted the fact that staff needs to develop information management capabilities that would enable it to both reactively and proactive respond to market trends. To that end, they claimed that firms have to build their competencies and analytical tools in both descriptive and predictive data analytics. IT vendors also claimed that the development of big data tools and competencies is of a major

importance, as it can empower firms to compile, analyse and use a large amount of data from various sources in order to increase their customer learning and responsiveness abilities. However, although the tourism professionals paid increased attention in developing their abilities to collect and use social media data solely for marketing purposes, the IT vendors and the tourism scholars repeatedly stressed the need to develop the staff's data management and exploitation abilities for supporting their decision-making in several business processes, e.g. customer service, experience/crisis management, innovation.

Finally, tourism scholars distinguished between three types of information resource management capabilities: *scientific knowledge* referring to skills and knowledge relating to statistical methods and tools for collecting, organising and analysing data; *interpretive intelligence* referring to the analytical and perceptive skills to ask the right questions, develop appropriate and useful hypotheses and analyse scenarios; and *business intelligence* referring to the skills required to extract business-relevant information from data-based and analytical insights and use the former for developing appropriate business actions (e.g. revenue opportunities, market segmentation strategies). Tourism professionals reported that it is difficult to find staff possessing all these three data management capabilities, while it is even more difficult to re-train the 'mature' staff to understand and appreciate the importance of developing these capabilities, specifically because of their attitude to manage by 'intuition', their resistance to change and persistence to work 'in the usual way' that they are familiar with and they are not threaten by 'new kids on the block' that possess skills that they do not know how to assess and manage. Hence, change management, organisational culture, leadership and mentoring issues were highlighted again as critical social CRM capabilities. From their perspective, IT scholars expressed their concerns about the firms' human resource policies and competencies, but also their own teaching and learning capabilities/methods that are required in order to inspire and enable staff/students to further develop, nurture and motivate their human creativity and team collaboration in using, interpreting and putting big data into business action. Overall, all informants agreed that information resource management capabilities are a vital social CRM capability, because they equip the firms with innovative means and strategies to: analyse and interpret meaningful customer information; enhance their customer learning capabilities; and take appropriate business-related actions.

### ***5.3 Information Technology Infrastructure***

Respondents identified the following characteristics and capabilities that the IT infrastructure should provide to firms for enhancing their social CRM capabilities: integration of social media applications with both front—office (e.g. reservations, transactions, customer complaint management and service management systems) and back-office applications (e.g. customer databases, market segmentation, customer value measurement modules); integration of social media applications and



information resources with various processes in order to break down departmental silos and enable a seamless customer experience; integration of social media applications with external partners and platforms (e.g. brand communities, bloggers, social networks e.g. Facebook applications, iTunes) for distributing and sharing content and building relations and networks; and integration of social media customer insight data with customer databases. Unfortunately, although IT vendors claimed their readiness to technologically support these integrations, tourism managers did not report that they were currently ready and able to afford for such integration, while the tourism scholars highlighted that even if tourism firms are able to get the highest sophisticated technology integration tools, the latter will not be able to produce any business results, unless if firms also support an organisational integration through open management systems and cultures, and an organisational re-engineering facilitating and rewarding team working across departments. Hence, the ability to combine technological with appropriate organisational resources for producing effective firm competencies was mentioned again as a critical social CRM capability.

#### ***5.4 Customer Centric Business Strategy***

All participants recognised that technologies and social media are transforming the way industries, consumers and companies are operating, and so to survive they highly emphasised that in order to survive, the tourism firms have to develop and adopt a new ‘management philosophy’ as to how to manage their customers, their ‘loyalty’ and value to the firm. Tourism professionals also recognised that CRM strategies are influencing their business strategies and the way they manage their daily operations, and so, the firm’s ability to think outside the box and continuously update, challenge and create a customer centric and oriented business strategy was considered as a major social CRM capability. The IT vendors also stressed that their technologies do not provide out-of-the-box magic business solutions, but instead firms need to possess the capabilities and creative thinking on how to exploit these tools for re-designing and implementing customer-centric strategies. Unless if firms have a clear vision and roadmap on how to use these technologies for developing their strategic thinking and daily operations, social CRM results will not get materialised. Finally, it was only one scholar who mentioned the need to possess dynamic social CRM capabilities referring to the firms’ ability to continuously sense the environment and develop proactive and flexible strategies that help firms to dynamically adapt and use their resources for addressing change. One hotel manager also mentioned the importance of a firm’s ability not only to develop a visionary customer-oriented strategy, but also the ability to nurture and foster such a strategic vision and culture to all organisational staff.

## **5.5 *Customer-centric Processes***

All three type of stakeholders reported that successful social CRM implementation demands firms' capabilities to design and deliver customer-centric processes that support the active customer involvement and participation in business processes. To achieve that, staff should possess the following capabilities: co-creation management: identify, provide and support customer activities across all business operations; customer empowerment: 'educate' and motivate the customers on how to participate in co-creation activities; community management: develop, nurture, participate and monitor brand communities; and social media firms' profiles, image and platforms management. Informants also identified the following social CRM capabilities that firms have to develop for supporting customer-centric processes: staff empowerment and continuous development; customer engagement management: design and provision of customer involvement opportunities; customer engagement management, e.g. gamification of business processes; and user permission management: staff access rights to information, processes and systems.

## **5.6 *Communication***

Traditional CRM technologies and capabilities focus on enabling employees to communicate internally and with customers externally. On the contrary, all informants identified the need that in order to implement social CRM, apart from the communication tools, firms have to also possess and build up their communication capabilities with: single customers; groups of customers; brand communities; employees; external partners; bloggers and other opinion influencers and leaders. Staff's capabilities to identify, understand, drive, influence and manage electronic-word-of-mouth (eWOM) as well as manage C2C conversations were also unanimously reported as a very vital social CRM capability.

## **5.7 *Performance Measurement***

The successful implementation of any strategy requires firms to measure their results and use this feedback for future improvements. In this vein, all informants stressed the importance of a reliable performance measurement system and capability that can support firms to continuously monitor and improve their social CRM performance. However, apart from the traditional CRM metrics, informants also identified that a social CRM performance capability will also include the ability of the firms to measure: the performance of customers in co-creation activities; the value of the customer in business processes apart from transactions such as eWOM; the value of brand communities and customer groups for the firm; and the value of

social media content and big data analysis in decision-making and the firm. In other words, informants recognised that the firms have to develop a performance measurement capability that understands, appreciates and is able to capture/measure the value of many intangible firm's assets/resources (e.g. customers, online content, communities) that may not even be under the possession or even control of the firm but they are still critically important to the success of social CRM. However, as firms can only manage what they measure, the firms' ability to develop and operate such a holistic performance management is of vital importance to social CRM success.

## 6 Conclusions and Implications for Future Research

The study developed and refined a list of social CRM capabilities considered by the industry as important competencies for successfully implementing social CRM. Findings from three different type of stakeholders (tourism firms, IT suppliers, and tourism scholars) confirmed that social CRM is more than a simple technological application or a digitisation of CRM. Social CRM is a business strategy that requires a different way of business thinking, organisation and performance management.

Out of the seven identified social CRM capabilities, only two of them refer to the need to acquire technological tools and built technological infrastructure. All the other capabilities emphasise the need to develop and nurtur the competencies of the human resources of both the staff and the customers and/or virtual communities. The latter emphasises and re-confirms the co-creation approach of social CRM that considers all stakeholders as value co-creators through communication, dialogues and resource exchanges. Social CRM cannot be successful without the customer active participation in firm's value creation activities, and so, customer motivation, education and empower are found as critically important. However, although customer management as partial employees has been previously addressed in the literature, a fresh approach to study this field is required taking into consideration the new profile, needs and resources of the social customers as well as the power of customer communities. Future research should also further investigate not only the specific competencies required by staff (i.e. interpretive or business intelligence) but most importantly how business schools and firms can enable people to develop these skills.

However, although findings were collected from various stakeholders, future studies should replicate the study in different contexts, countries and in a larger sample in order to further validate, refine and expand the results. In fact, it will be interesting to investigate whether social CRM implementation and competencies differ or not various industries. Future studies should also examine strategies that the firms have to adopt for developing these required social CRM capabilities.

## References

- Acker, O., Gröne, F., Akkad, F., Pötscher, F., & Yazbek, R. (2011). Social CRM: Link into the social web. *Journal of Direct, Data and Digital Marketing Practice*, 13(1), 3–10.
- Baird, C. H., & Parasnis, G. (2011). From social media to social customer relationship management. *Strategy & Leadership*, 39(5), 30–37.
- Berezan, O., Raab, C., Tanford, S., & Kim, Y. S. (2015). Evaluating loyalty constructs among hotel reward program members. *Hospitality & Tourism Research*, 39(2), 198–224.
- Bowen, J. T., & McCain, S. L. C. (2015). Transitioning loyalty programs. *International Journal of Contemporary Hospitality Management*, 27(3), 415–430.
- Dessart, L., Veloutsou, C., & MorganThomas, A. (2015). Consumer engagement in online brand communities. *Journal of Product & Brand Management*, 24(1), 28–42.
- Diffley, S., & McCole, P. (2015). Extending customer relationship management into a social context. *The Service Industries Journal*, 35(11–12), 591–610.
- Faase, R. (2011). Web 2.0 in the CRM domain: Defining social CRM. *International Journal of Electronic Customer Relationship Management*, 5(1), 1–22.
- Greenberg, P. (2010). The impact of CRM 2.0 on customer insight. *Journal of Business & Industrial Marketing*, 25(6), 410–419.
- Greenberg, P. (2011). Social CRM to grow stronger in 2011. *Enterprise Innovation*, 7(1), 41.
- Küpper, T. (2014). Measuring the success of social CRM—First approach and future research. *16th ICEIS conference*, Lisbon, Portugal, 573–582.
- Küpper, T., Lehmkuhl, T., Jung, R., & Wieneke, R. (2014). Features for Social CRM Technology. *20th Americas Conference on Information Systems*, Savannah, USA, 1–10.
- Küpper, T., Lehmkuhl, T., Wittkuhn, N., Wieneke, A., & Jung, R. (2015). Social CRM Performance Model: An Empirical Evaluation. *28th Bled eConference: # eWellBeing*, 418–435.
- Lehmkuhl, T. (2014). *Towards social CRM—A model for deploying Web 2.0 in customer relationship management*. Diss. School of Management, University of St. Gallen.
- Malthouse, E. C., Haenlein, M., Skiera, B., Wege, E., & Zhang, M. (2013). Managing Customer Relationships in the Social Media Era. *Journal of Interactive Marketing*, 27, 270–280.
- Mayock, P. (2014). Personalization equals loyalty for millennials. *Hotel News Now*.
- Sarner, A., Thompson, J. D., Drakos, N., Fletcher, C., Mann, J., & Maoz, M. (2011). *Magic quadrant for social CRM*. Stamford: Gartner.
- Sigala, M. (2011). eCRM 2.0 applications and trends: The use and perceptions of Greek tourism firms of social networks. *Computers in Human Behavior*, 27, 655–661.
- Sigala, M. (2015). The application and impact of gamification funware on trip planning and experiences. *Electronic Markets*, 25(3), 189–209.
- Trainor, K. J., Andzulis, J., Rapp, A., & Agnihotri, R. (2014). Social media technology usage and customer relationship performance: A capabilities-based examination of social CRM. *Journal of Business Research*, 67(6), 1201–1208.
- Weissenberg, A., Katz, A., & Narula, A. (2013). Hotel loyalty. [www.deloitte.com/view/en\\_US/](http://www.deloitte.com/view/en_US/).

**Part III**  
**Online Travel Reviews**

# Hotel Website Quality Versus Star Level: The Case of Macau Hotel Websites

Shanshan Qi

**Abstract** How can Macau's hotels keep pace with consumer expectations? This study incorporates fuzzy comprehensive evaluation (FCE) into a functionality assessment of Macau hotel websites. Research participants were asked to rate the importance of website functionality attributes, and rate the functionality of the websites in terms of how well they presented these attributes, by means of linguistic terms. An overall percentage score was then assigned to the hotels, allowing them to be ranked in order of website performance. Although hotels with the highest star ratings (5 star deluxe) received the highest average scores for their websites, the website performance of hotels ranging from budget accommodation to 5 star did not consistently reflect their star rating. The variations are attributed to such factors as a superfluity of information (wherein the most desired features are not sufficiently accessible), a lack of interactive features, and the hotel's mismanagement of online feedback, including an unawareness of perceptions posted on independent, user-review sites. The research findings represent a preliminary attempt to assess the interactivity of Macau hotel websites in light of consumer preferences and a web 2.0 design format.

**Keywords** Macau • Hotel website • Functionality • Website content

## 1 Introduction

The hotel industry has long been recognized as one of the most “globalized” industries in the service sector (Whitla, Walters, & Davies, 2007). The Internet has been a key factor in this globalization process, and hotel websites have become indispensable. They count as a major medium of reservations and services (Kim & Kim, 2004), a display and transaction platform for suppliers and prospective guests. The establishment of a dedicated website is within the resource capacities of budget accommodations and multi-star luxury hotels alike, facilitating cross-spectrum competitiveness. Hotels jockeying for a competitive edge feature on their websites a diverse array of enticements, such as year of establishment (e.g. “Serving Guests

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of Macau since 1980,” or “est. 1980”), service award announcements, membership in (or pledged abidance with the standards of) regulatory bodies and oversight committees, customer testimonials, 360° views of rooms and facilities, scenic balcony views, photos of smiling staff members with qualifications and service records attached, candlelit diners, massage therapy, guided sightseeing tours, discount offers, and links to local sporting, cultural and entertainment venues. Prospective guests now “shop” for a hotel much as they would any other consumer item, and with so many options to choose from, it is clear that hotel website can significantly influence consumers’ decision making, to the extent that website performance counts as a strong determiner of hotel performance tout court. Thus Corigliano and Baggio (2006) state that the quality and performance of hotel websites should be monitored so that hotels can deliver the best service to their customers. And currently, the best are the best: Despite the levelling effect of the Internet, Chung and Law (2003) and Liang and Law (2003) found that luxury hotel websites outperformed the websites of economy hotels. Indeed, research by Law and Cheung (2006) shows that consumers expect better performance from high star level hotel websites.

Macau (alternatively Macao) is a Special Administrative Region of China. It is a popular tourism destination with great potential in tourism industry development. The Statistics and Census Service of Macau (2015), reports in 2014 over 31.5 million tourist arrivals and 61.75 billion MOP (7.75 billion USD) spent. The continued growth in tourist arrivals presents challenges and opportunities for Macau’s hotel businesses. One challenge is that these are short stays: 1.4 nights on average (Statistics and Census Service of Macau, 2015). In the wake of fast developing information technologies, and consumers’ proportionately accelerating expectations as to online services, it is essential that Macau hotel websites provide enhanced online service quality, as a means of increasing occupancy rates and in particular of extending hotel stays. This study compares performance among hotels of various star levels, with the following objectives:

- (a) Revise hotel website functionality lists
- (b) Assess the functionality performance of Macau hotel websites
- (c) Detect significant performance-based variations among star levels

## 2 Literature Review

In response to the hotel industry’s increasing online presence over the past two decades, hoteliers and researchers have intensively focused on the performance of hotel websites, seeking to determine the factors that influence customers’ online perceptions and choices. Schmidt, Cantalops and Santos (2008) found that hotel websites need to provide comprehensive information and reservation functions to meet the requirements of consumers. Jeong and Lambert (2001) emphasized the importance of product-related information on hotel facilities, room types and other features to consumers when making purchase decisions. Ho and Lee (2007)

indicated that online communities, for example a chat room, forum or bulletin board system (BBS), provide an effective means for consumers to exchange ideas and experiences.

Website functionality, which relates to the content of a website, is a widely applied concept for website evaluation. In a 2003 study, Chung and Law considered five sub-categories of website functionality: facilities, reservations, customer contact, surrounding area, and website management. Liang and Law conducted a functionality performance assessment of selected China-based hotel websites (2003); Law, Ho and Cheung (2004) compared China- and US-based hotel websites on the basis of functionality performance. Online browsers and online buyers have been compared in terms of hotel website functionality attributes (Law & Cheung, 2006; Law & Hsu, 2006), and in terms of purchase intention and satisfaction as to website functionality and service quality (Law & Bai, 2008). Hsieh performed a content analysis of hotel websites (2012); Ip, Law and Lee established a fuzzy analytic hierarchy process (fuzzy AHP) method for evaluating Hong Kong hotel websites (2012); Ha and Im (2012) noted that consumers no longer satisfied with the available shopping and information options are more likely to share their perceptions online.

Interaction between hoteliers and consumers is a necessary aspect of online service. The format of websites has transitioned from web 1.0 to web 2.0, which means that websites no longer merely present business information to consumers but rather conduct information exchange between businesses and consumers (Tredinnick, 2006). Online social media embody web 2.0 in another form, one that assists consumers in their online information sharing and producing (Leung, Law, van Hoof, & Buhalis, 2013). However, there has been little focus on assessing website performance in terms of online interaction, particularly as regards Macau hotel websites. In what represents a preliminary attempt to assess Macau hotel website functionality in light of consumer preferences and the web 2.0 format, this study adds “interactions with customers” to the existing functionality list, which includes: links to social media (e.g. Facebook, Wechat friend circle, Renren); links to bloggers (e.g. Weiblog, Twitter, assorted blogs); online news (e.g. Digg, Propeller, Reddit); sharing of video or image content (e.g. YouTube and Hulu); online forum function (e.g. BBS); and hotel responses to customer requirements (online one-to-one service, call back function or online feedback form).

The study employs a modified functionality list for website evaluation. The list comprises five categories: general information (how the hotel presents itself on its website); reservations (information obtained by way of all online booking related components); website management (how the hotel manages its online feedback); surrounding area information (apprising prospective guests of local geographic and cultural-historical points of interest); and online interaction features.



### 3 Methodology

Qualitative and quantitative approaches are utilized. A survey was conducted to ascertain the importance of website functionality. The questionnaire was distributed to Macau locals by use of a snowball sampling method. All respondents had to have acquired hotel information searching experience sometime in the past 12 months. The questionnaire was divided into three sections. The first section consisted of a qualifying question that identified hotel customers. The second section was designed to determine the importance of the functionality attributes of hotel websites. The respondents were asked to scale importance by means of linguistic terms ranging from “very important” to “very unimportant.” The third section collected demographic data such as age, gender, monthly household income, and educational attainment.

A qualitative approach was adopted for website evaluation. Participants were recruited from an English teaching college in Macau. The participants were volunteers who had answered the questionnaire and wished to participate in the website evaluation process. A total of 26 participants were asked to evaluate 55 active hotel websites in Macau, with 4–5 websites assigned to each pair of evaluators, two participants were formed as groups were formed to avoid personal bias. These hotel websites were collected from the Macau Government Tourism Organization website (MGTO, 2014). A questionnaire comprising a list of website functionality attributes was provided to the participants. The participants were gathered together at a campus computer lab and asked to assess the functionality of the English web page of the hotel websites. The questions were represented by linguistic terms from “very good” to “very poor” (see Fig. 2). The data collection process began November 2013 and was completed February 2014.

Fuzzy comprehensive evaluation (FCE) is based on the theory of fuzzy mathematics (Zadeh, 1965), which applies fuzzy membership functions to assessment tasks. Human perceptions are often vague when assessing weights by numerical measures (Bellman & Zadeh, 1970). FCE uses linguistic assessments to present consumers’ perceptions regarding website performance, and transforms these perceptions into triangular fuzzy numbers (Fig. 1). In addition to translating vague evaluations into linguistic terms, this method is especially good at handling evaluation criteria in different hierarchies with a relatively simple procedure for data

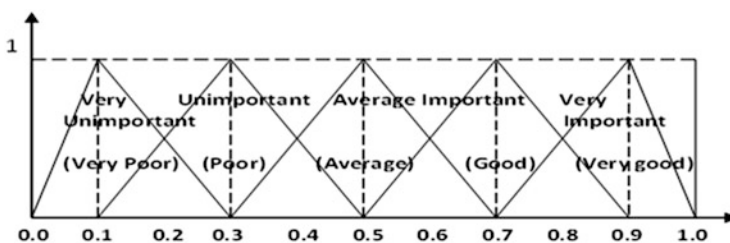


Fig. 1 Triangular fuzzy numbers

collection and calculation (Feng & Xu, 1999). Triangular fuzzy numbers (Fig. 1) are adopted to determine the degree of importance of each attribute and to quantify the performance of each hotel website.

## 4 Findings

Table 1 shows the demographic profile of the research participants. Among 123 successfully collected questionnaires, 42.3 % are male respondents and 57.7 % are female. The majority of the respondents had received education at the degree level or below. Most of the respondents were in the 19–34 age range, with monthly incomes of less than 10,000 MOP (1252.67 USD), while 15.7 % of respondents earned more than 20,000 MOP (2505.34 USD) per month. This income disparity was likely due to age-based variations in economic development.

Table 2 shows the overall performance of Macau hotel websites. The factors of “General information” and “Reservation information” were perceived as the most important functions among all the functionality factors, which followed by “Interactions with customer” and “Website management”. The “Surrounding area

**Table 1** Demographics of respondents

Demographic categories		Number	Percentage
Gender	Male	52	42.30 %
	Female	71	57.70 %
Education	Primary School	1	0.80 %
	High School	13	10.60 %
	College diploma	32	26.00 %
	College degree	64	52.00 %
	Postgraduate	13	10.60 %
Age	18 or less	1	0.80 %
	19–24	72	58.50 %
	25–34	30	24.40 %
	35–44	10	8.10 %
	45–54	10	8.10 %
Income (in MOP)	10,000 or less	52	42.30 %
	10,001–12,000	9	7.30 %
	12,001–14,000	5	4.10 %
	14,001–16,000	9	7.30 %
	16,001–18,000	5	4.10 %
	18,001–20,000	5	4.10 %
	20,001–22,000	2	1.60 %
	24,001–26,000	5	4.10 %
	26,001 or above	13	10.60 %
No answer	18	14.60 %	

**Table 2** Overall importance and performance of Macau hotel websites

Attributes	Importance	Performance
<i>General information</i>	0.71	0.65
1. Hotel descriptions (hotel introduction)	0.83	0.72
2. Hotel location (maps, traffic information about how to reach the hotel)	0.96	0.76
3. Hotel facilities (guest room, restaurants and meeting facilities)	0.82	0.68
4. Promotion of products (special offers, frequent guest programs)	0.5	0.56
5. Availability of virtual tours/video files of the hotel	0.4	0.53
<i>Reservation information</i>	0.71	0.58
6. Room rate	0.8	0.68
7. Room availability	0.79	0.52
8. View or cancel reservations	0.66	0.56
9. Check in and check-out time	0.64	0.53
10. Price ranges of different products/services	0.63	0.56
11. Payment options	0.75	0.57
12. Secured payment systems	0.69	0.66
<i>Website management</i>	0.34	0.51
13. Worldwide reservations phone number	0.46	0.69
14. Staff directory search function	0.15	0.36
15. Create or modify personal profile for customers	0.18	0.48
16. Links to other related businesses	0.31	0.54
17. Product warranty/legality	0.58	0.50
<i>Interactions with customer</i>	0.45	0.43
18. Transportation	0.65	0.56
19. Airport information	0.58	0.46
20. Main attractions of the destination	0.59	0.41
21. General information about the destination	0.34	0.46
22. Weather report	0.1	0.27
<i>Surrounding area information</i>	0.2	0.34
23. Online news (eg: Digg, Propeller, Reddit)	0.1	0.24
24. Connect to online social media (eg: Facebook, Wechat friend circle, Renren)	0.22	0.41
25. Sharing online video or images (eg: youtube)	0.07	0.34
26. Link to online blogger (eg: Weiblog, Twitter, Blogs)	0.22	0.34
27. Online forum function (eg: BBS or connect to their party forum)	0.03	0.29
28. Hotel response to customer requirement (online one-to-one service, call back function or online feedback form)	0.57	0.39

information” were perceived the lowest importance. Despite the factor of “Interactions with customer” received as the third important factor in functionality, it perceived relatively low performance from consumers. This finding implied Macau hotel websites need further improvement in certain factors. Figure 2 further

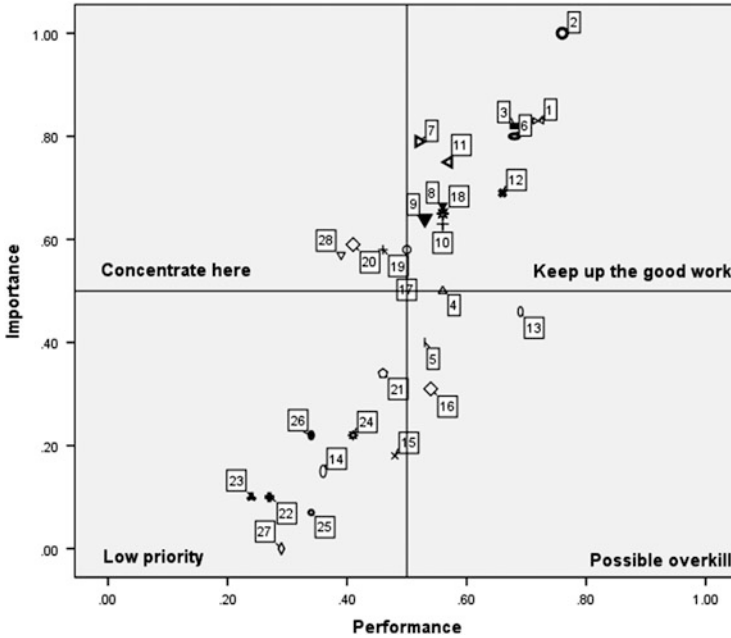


Fig. 2 Importance and performance of Macau hotel websites

displayed the detailed information of Macau hotel websites in functionality attributes.

Figure 2 illustrates a revised IPA (Importance Performance Analysis) by combining the result in Table 1 to represent website functionality performance for Macau hotels. Quadrant I consisted of four factors: product warranty/legality, airport information, main attractions of the destination, and hotel response to customer requirements (online one-to-one service, callback function or online feedback form). The research participants attached great importance to these factors, and found performance unsatisfactory. The factors in quadrant II and VI were rated more highly.

The factors in quadrant III were rated low as to importance and performance. These nine factors are: general information about the destination, connect to online social media, create or modify personal profile for customers, staff directory search function, links to bloggers, online news, weather reports, sharing online video or images, and online forum function. The implication is that consumers are not very interested in hotel offers connecting information to other online platforms. Generally speaking, the IPA result showed that the Macau hotel websites evaluated performed well; however, improvements are required in transportation information and hotelier’s online responses to customer preferences and queries.

After the normalization process the overall scores of Macau hotel websites fell into a section from 0 to 1, in order to better perform the evaluation result of each hotel website all the final scores were multiplied 100. Table 3 shows the

**Table 3** Hotel Website performance

Hotel ID	Hotel	Star level	Overall score
1	Altira	5 star deluxe	93.8
2	Crown Towers	5 star deluxe	93.8
3	MGM Macau	5 star deluxe	80.5
4	Four Seasons Hotel	5 star deluxe	93.8
5	Grand Lisboa	5 star deluxe	93.8
6	Landmark Hotel	5 star deluxe	93.8
7	Sands	5 star deluxe	75
8	Wynn	5 star deluxe	84.6
Average score			88.6
9	Banyan Tree Macau	5 star	80.5
10	Beijing Imperial Palace Hotel	5 star	25
11	Conrad Macau	5 star	70.4
12	Galaxy Hotel	5 star	93.8
13	Grand Hyatt Macau	5 star	75
14	Grand Lapa	5 star	93.8
15	L'Arc Hotel Macau	5 star	85.5
16	Lisboa	5 star	85.5
17	Mandarin Oriental Macau	5 star	83.8
18	Okura Macau	5 star	93.8
19	Regency Hotel	5 star	75
20	Royal	5 star	84.6
21	São Tiago da Barra	5 star	81.2
22	Sheraton Macau Hotel	5 star	75
23	Sofitel Macau at Ponte 16	5 star	81.2
24	StarWorld Hotel Macau	5 star	93.8
25	The Venetian Macau	5 star	93.8
26	Grand Coloane Resort	5 star	93.8
Average score			81.4
27	Golden Crown China Hotel	4 star	93.8
28	Golden Dragon	4 star	75
29	Grandview Hotel	4 star	75
30	Hard Rock Hotel	4 star	84.6
31	Holiday Inn Macau	4 star	81.2
32	Holiday Inn Macao Cotai Central	4 star	79.8
33	Hotel Beverly Plaza	4 star	83.5
34	Hotel Casa Real	4 star	75
35	Metropark Hotel Macau	4 star	75
36	Pousada de Coloane	4 star	75
37	President Hotel	4 star	50
38	Rio Hotel Macau	4 star	75
39	Royal Infante Harbour View Hotel	4 star	75
40	Taipa Square	4 star	75

(continued)

**Table 3** (continued)

Hotel ID	Hotel	Star level	Overall score
Average score			76.6
41	Best Western Hotel Taipa Macau	3 star	93.8
42	Fortuna	3 star	93.8
43	Fu Hua Guangdong Hotel Macau	3 star	75
44	Grand Emperor Hotel	3 star	75
45	Guia	3 star	93.8
46	Hotel Rocks	3 star	70.9
47	Lan Kwai Fong	3 star	85.5
48	Metrópole	3 star	70.9
49	Sintra	3 star	93.8
50	Victoria Hotel	3 star	78.4
51	Waldo Hotel	3 star	65.8
Average score			81.5
52	Holiday Hotel Macau	budget accommodation	93.8
53	Macau Masters Hotel	budget accommodation	93.8
54	Sun Sun Hotel Macau	budget accommodation	70.9
55	Hospedaria San Va	budget accommodation	75
Average score			83.3

functionality performance of 55 hotels in Macau, the full mark is 100. The 5 star deluxe hotels listed received the highest average scores, i.e. their websites were perceived as best performing. However, the budget hotels listed scored on average 83.3, higher than the four and three star hotel averages of 76.6 and 81.5 respectively. This relatively high performance for lower tier accommodations was likely due to the preference of economizing, would-be travelers for basic features (Ip, Law, & Lee, 2012). Some of the hotels may have presented too much information on their websites (see Fig. 2 “Possible overkill”), confusing consumers who are planning a short stay. The findings expressed in Table 4 further demonstrate that hotel star level does not necessarily equate to website performance.

A K-means cluster analyses is presented in Table 4 by using the performance scores of each hotel to category the hotels into different clusters base on its performance. The first cluster group in Table 4 includes hotels from 3 star to 5 star deluxe; the second cluster ranges from budget accommodation to 5 star level, the third cluster has hotels from 4 to 5 star deluxe, the fourth cluster presents 4 and 5 star hotels, and the fifth cluster group includes hotels from budget accommodation to 5 star deluxe.

Table 5 shows that the five cluster groups differ greatly with regard to three of the five functionality factors, excepting general information about the destination, and hotel location. The websites performed poorly in terms of interactions with customers.

**Table 4** Cluster results based on perceived functionality performance

Hotel ID	Hotel	Star level	Cluster	Distance
5	Grand Hyatt Macau	5 star	1	0.355
12	Royal	5 star	1	0.318
13	São Tiago da Barra	5 star	1	0.397
18	Grand Coloane Resort	5 star	1	0.320
20	Crown Towers	5 star deluxe	1	0.293
23	Grand Lisboa	5 star deluxe	1	0.256
24	Landmark Hotel	5 star deluxe	1	0.211
28	Golden Dragon	4 star	1	0.219
29	Grandview Hotel	4 star	1	0.177
34	Hotel Casa Real	4 star	1	0.143
35	Metropark Hotel Macau	4 star	1	0.225
39	Royal Infante Harbour View Hotel	4 star	1	0.279
41	Best Western	3 star	1	0.308
43	Fu Hua Guangdong Hotel Macau	3 star	1	0.254
47	Lan Kwai Fong	3 star	1	0.314
48	Metrópole	3 star	1	0.279
49	Sintra	3 star	1	0.260
2	Beijing Imperial Palace Hotel	5 star	2	0.328
11	Regency Hotel	5 star	2	0.132
37	President Hotel	4 star	2	0.198
44	Grand Emperor Hotel	3 star	2	0.170
45	Guia	3 star	2	0.149
46	Hotel Rocks	3 star	2	0.172
51	Waldo Hotel	3 star	2	0.110
55	Hospedaria San Va	budget accommodation	2	0.120
3	Conrad Macau	5 star	3	0.295
9	Mandarin Oriental Macau	5 star	3	0.218
10	Okura Macau	5 star	3	0.201
14	Sheraton Macau	5 star	3	0.151
17	The Venetian Macau	5 star	3	0.259
19	Altira	5 star deluxe	3	0.389
22	Four Seasons Hotel	5 star deluxe	3	0.228
25	Sands	5 star deluxe	3	0.288
30	Hard Rock	4 star	3	0.287
32	Holiday Inn Macao Cotai Central	4 star	3	0.232
33	Hotel Beverly Plaza	4 star	3	0.243
1	Banyan Tree Macau	5 star	4	0.220
4	Galaxy Hotel	5 star	4	0.234
6	Grand Lapa	5 star	4	0.399
8	Lisboa	5 star	4	0.241
15	Sofitel Macau at Ponte 16	5 star	4	0.362
16	StarWorld Hotel Macau	5 star	4	0.257

(continued)

**Table 4** (continued)

Hotel ID	Hotel	Star level	Cluster	Distance
21	MGM Macau	5 star deluxe	4	0.331
31	Holiday Inn Macau	4 star	4	0.238
7	L’Arc Hotel Macau	5 star	5	0.258
26	Wynn	5 star deluxe	5	0.155
27	Golden Crown China Hotel	4 star	5	0.148
36	Pousada de Coloane Macau	4 star	5	0.268
38	Rio Hotel Macau	4 star	5	0.282
40	Taipa Square	4 star	5	0.232
42	Fortuna	3 star	5	0.176
50	Victoria Hotel	3 star	5	0.324
52	Holiday Hotel Macau	budget accommodation	5	0.256
53	Macau Masters Hotel	budget accommodation	5	0.232
54	Sun Sun Hotel	budget accommodation	5	0.197

## 5 Conclusion and Discussion

Macau hotel websites perform well on the most of the functionality attributes. The exceptions were product warranty/legality, airport information, main attractions of destination, and hotel response to customer requirements, all of which factors performed poorly while being perceived as highly important. Also performing poorly, but perceived to be of low importance, were functions related to interactions with customers, for instance online social media and online information sharing. Unlike other functionality dimensions which have been well developed, the functions of interactions with customers are still in their infancy stage. Most of the hotels evaluated made a list of interaction functions on their front page for consumer selection. But the findings imply that consumers expect immediate interaction from hotels, as well as product guarantees. Consumers are likely to find and share information independent of hotel websites, therefore hoteliers who wish to develop their online interaction with consumers may consider keeping an eye on the popular online information sharing channels (e.g. TripAdvisor) and citing favourable reviews or comments on their own, hotel websites, while working to remedy perceived shortfalls in service.

Despite the 5 star deluxe hotels receiving the highest average scores for website functionality, the findings showed that perceptions of functionality were not necessarily commensurable with star level. Some hotel webpages inundated the viewer with information, obscuring the basic features that consumers primarily look for, such as room rates, room availability, and hotel introduction (Ip et al., 2012). In contrast, budget accommodations, with their limited resources, offer a leaner, less cluttered interaction experience, allowing consumers to access the features they want quickly and clearly. Hotels of whatever star level may thus consider



**Table 5** Perceived differences among five cluster groups

Dimensions	Mean of performance	df	Sig.
General information	0.65	4	***
1. Hotel descriptions (hotel introduction)	0.72	52	0.002
2. Hotel location (maps, traffic information)	0.76	52	0.126
3. Hotel facilities (guest room, restaurants and meeting facilities)	0.68	52	***
4. Product promotions (special offers, frequent guest programs)	0.56	52	***
5. Availability of virtual tours/video files of the hotel	0.53	52	***
Reservation information	0.58	4	***
6. Room rate	0.68	52	***
7. Room availability	0.52	52	***
8. View or cancel reservations	0.56	52	***
9. Check-in and check-out time	0.53	52	***
10. Price ranges of products and services	0.56	52	***
11. Payment options	0.57	52	***
12. Secured payment systems	0.66	52	***
Website management	0.51	4	***
13. Worldwide reservations phone number	0.69	52	***
14. Staff directory search function	0.36	52	0.007
15. Create or modify personal profile for customers	0.48	52	***
16. Links to related businesses	0.54	52	0.001
17. Product warranty/legality	0.50	52	***
Surrounding area information	0.43	4	***
18. Transportation	0.56	52	***
19. Airport information	0.46	52	***
20. Main attractions of destination	0.41	52	0.01
21. General information about destination	0.46	52	0.18
22. Weather reports	0.27	52	0.005
Interactions with customers	0.33	4	***
23. Online news	0.24	52	***
24. Connect to online social media	0.41	52	***
25. Sharing online video or images	0.34	52	***
26. Links to blogs	0.34	52	***
27. Online forum function	0.29	52	***
28. Hotel response to customer requirements	0.39	52	***

Significance <0.01\*\*\*

prioritizing information, displaying the most desired attributes up-front and in interactive formats, while relegating ancillary features to a greater “click distance.”

## 6 Research Limitations

Although this study seeks to enhance the performance capacity of the Macau hotel industry while contributing to academic research in online business–consumer interactions, the study has its limitations. First, the relatively small, non-randomized sample of participants limits the ability to draw generalized conclusions. A larger sample size recruited from multiple regions and occupations, and with a larger age range (e.g. one that includes retirees) is suggested for future studies.

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## References

- Bellman, B. E., & Zadeh, L. A. (1970). Decision-making in a fuzzy environment. *Management Science*, 17(4), 141–164.
- Chung, T., & Law, R. (2003). Developing a performance indicator for hotel websites. *International Journal of Hospitality Management*, 22(1), 119–125.
- Corigliano, M. A., & Baggio, R. (2006). On the significance of tourism website evaluations. In M. Hitz, M. Sigala, & J. Murphy (Eds.), *Information and communication technologies in tourism* (pp. 320–331). Wien, New York: Springer.
- Feng, S., & Xu, L. (1999). An intelligent decision support system for fuzzy comprehensive evaluation of urban development. *Expert Systems with Applications*, 16(1), 21–32.
- Ha, Y., & Im, H. (2012). Role of web site design quality in satisfaction and word of mouth generation. *Journal of Service Management*, 23(1), 79–96.
- Ho, C.-I., & Lee, Y.-L. (2007). The development of an e-travel service quality scale. *Tour Manage*, 28(6), 1434–1449.
- Hsieh, Y.-C. (2012). Hotel companies' environmental policies and practices: A content analysis of their web pages. *International Journal of Contemporary Hospitality Management*, 24(1), 97–121.
- Ip, C., Law, R., & Lee, H. A. (2012). The evaluation of hotel website functionality by fuzzy analytic hierarchy process. *Journal of Travel & Tourism Marketing*, 29(3), 263–278.
- Jeong, M., & Lambert, C. U. (2001). Adaptation of an information quality framework to measure customers' behavioral intentions to use lodging websites. *International Journal of Hospitality Management*, 20(1), 129–146.
- Kim, W. G., & Kim, D. J. (2004). Factors affecting online hotel reservation intention between online and non-online customers. *International Journal of Hospitality Management*, 23(4), 381–395.
- Law, R., & Bai, B. (2008). How do the preferences of online buyers and browsers differ on the design and content of travel websites? *International Journal of Contemporary Hospitality Management*, 20(4), 388–400.
- Law, R., & Cheung, C. (2006). A study of the perceived importance of the overall website quality of different classes of hotels. *International Journal of Hospitality Management*, 25(3), 525–531.
- Law, R., Ho, D., & Cheung, C. (2004). A study of the functionality of hotel websites in mainland China and the United States. *Journal of Academy of Business and Economics*, 3(1), 202–209.

- Law, R., & Hsu, C. H. C. (2006). Importance of hotel website dimensions and attributes: Perceptions of online browsers and online purchasers. *Journal of Hospitality and Tourism Research*, 30(3), 295–312.
- Leung, D., Law, R., van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel & Tourism Marketing*, 30(1/2), 3–22.
- Liang, K., & Law, R. (2003). A modified functionality performance evaluation model for evaluating the performance of China based hotel websites. *Journal of Academy of Business and Economics*, 2(2), 193–208.
- Macau Government Tourist Office (2014). <http://en.macautourism.gov.mo/plan/hotels.php> (accessed on 13/07/2015)
- Schmidt, S., Cantalops, A. S., & Santos, C. P. (2008). The characteristics of hotel websites and their implications for website effectiveness. *International Journal of Hospitality Management*, 27(4), 504–516.
- Statistics and Census Service. (2015). *Statistics of tourists arrivals*. <http://www.dsec.gov.mo/Statistic.aspx?NodeGuid=251baebb-6e5b-4452-8ad1-7768eafc99ed>
- Tredinnick, L. (2006). Web 2.0 and business: A pointer to the intranets of the future? *Business Information Review*, 23(4), 228–234.
- Whitla, P., Walters, P. G. P., & Davies, H. (2007). Global strategies in the international hotel industry. *International Journal of Hospitality Management*, 27(2), 204–213.
- Zadeh, L. A. (1965). Fuzzy sets. *Information and Control*, 8(3), 338–353.

# An Empirical Examination of Online Restaurant Reviews (Yelp.com): Moderating Roles of Restaurant Type and Self-image Disclosure

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**Abstract** A growing reliance on online travel reviews (OTRs) as a salient information source facilitates research on online reviews in terms of consumer perceptions and purchase decisions about tourism products. Heretofore, most of literature on online reviews has been paying attention to text-based reviews. Due to the increasing usage of visual review formats, we explored the impact of image-based reviews on consumer evaluation of review usefulness. An empirical analysis was used to investigate the impacts of two presentation formats (i.e., text-based and image-based reviews within the same review) on review usefulness based on the Elaboration Likelihood Model. In addition, the moderating roles of restaurant type (i.e., casual vs. fine dining) and reviewers' self-image disclosure in the evaluation of review usefulness were validated. A total of 2629 restaurant reviews on Yelp.com were gathered by using a web-harvesting method. Finally, the results indicate that not only text-based reviews but also the image-based reviews are indeed significant predictors of the perception of review evaluation. Moreover, restaurant type and self-image disclosure significantly moderate the effects of presentation formats on consumer evaluation. We discuss over these findings, and suggest theoretical and practical implications in conclusion.

**Keywords** Online travel review (OTR) • Review usefulness • Presentation format • Image-based review • Elaboration Likelihood Model (ELM) • Restaurant type • Self-image disclosure

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# 1 Introduction

Online reviews, as a new form of social communication, facilitate providing and sharing information between review website organizers and customers as well as among consumers (Park & Nicolau, 2015). With the advancement of mobile technologies, travel online reviews have become widely available. Therefore, tourists are also likely to encounter electronic word-of-mouth (eWOM) and diverse online travel review websites (e.g., Tripadvisor, Yelp, Citysearch) that can offer useful information about experiential goods, such as destinations, hotels, restaurants (Schuckert, Liu, & Law, 2015). Online travel reviews (OTRs) are created by and voluntarily communicated among travellers, based on prior experiences, which could offer as important references for potential customers (Jin, Yang, Rhee, & Lee, 2013). Particularly, in the tourism and hospitality industry, because experiential goods and services have the intangible and complex characteristics, tourism consumers tend to rely heavily on prior customers' reviews to confirm services quality before their consumption (Ghose & Ipeirotis, 2011; Korfiatis, García-Bariocanal, & Sánchez-Alonso, 2012; Liu & Park, 2015; Racherla & Friske, 2012; Rhee & Yang, 2015a, 2015b).

In this context, many studies have explored on various features and elements of online reviews to evaluate their influences on consumer perceptions (Jeong & Jang, 2011; Liu & Park, 2015; Park & Nicolau, 2015; Racherla & Friske, 2012). They denoted that the verbal aspects used in the review, star ratings, and reviewers' identity disclosure, among other factors, play significant roles. To our knowledge, however, even though there is an increasing usage of posting visual formats (i.e., image-based, video-based reviews), only a few studies have investigated on the presentation format of the online review. Accordingly, we include not only image formats but also text formats as influential factors.

In order to investigate the role of online image and text review in review usefulness within the same review in the context of restaurant. The objectives of our study are to explore the different presentation formats of OTRs affecting the usefulness on the basis of Petty and Cacioppo's (1986) Elaboration Likelihood Model (ELM), the most prominent dual process theory. The ELM proposes two major routes to persuasion (central vs. peripheral routes). The central route is closely related to a person's careful and thoughtful consideration from the information source, in the contrary, the peripheral route is generally unrelated to the logical inference of the stimulus.

In this way, we clarified text reviews as central cues: review length, review readability and image reviews as peripheral cues: physical environment images, food & beverage images. In central cues, persuasion is derived through text elaboration, whereas, in peripheral cues, responses occur from the attractiveness of the source or environment characteristics. We would raise hypothetical arguments that customers are likely to focus on different information sources, either central or peripheral cues of reviews. The second objective of this research is to examine the moderating roles of restaurant type (casual vs. fine dining) and self-

image disclosure, depending on the presentation format. In the restaurant setting, a casual restaurant provides an informal and relaxed environment where customers enjoy dining-out at moderate prices, while a fine dining restaurant creates an elegant, even luxurious, environment where customers tend to pay gladly a high price (Hwang & Ok, 2013). Moreover, in OTRs setting, reviewers' identity disclosure is a significant factor to increase the credibility of information sources (Fogg et al., 2001; Forman, Ghose, & Wiesenfeld, 2008; Liu & Park, 2015). The model is empirically tested using 2629 review data of restaurants, collected by using a web-harvesting method, from Yelp.com, one of the most popular OTR websites dedicated to services such as restaurant businesses. The findings of this research would contribute to develop effective online marketing strategies in tourism and hospitality sectors.

## 2 Theoretical Background and Hypotheses Development

### 2.1 *Online Travel Reviews*

Current consumers popularly obtain specific and dedicated information through online reviews to make decision for purchasing products (Park & Nicolau, 2015). Online reviews elicit high credibility and reliance in comparison with information provided by vendors of product. As the importance of online reviews increases, previous scholars in the tourism and hospitality sector have mainly paid attention to explore the characteristics of reviews and reviewers to assess the effect of online reviews on three facets: product sales (Ye, Law, Gu, & Chen, 2011; Zhang, Lee, & Zhao, 2010a), travel decision making processes (Park, Lee, & Han, 2007; Sparks & Browning, 2011; Vermeulen & Seegers, 2009; Xiang & Gretzel, 2010), and review evaluation (Filieri & McLeay, 2014; Liu & Park, 2015; Racherla & Friske, 2012).

Ye et al. (2011) assessed the relationships between review features and room sales, and they found that review ratings and room prices are vital elements to predict room sales. Vermeulen and Seegers (2009) conducted the effect of online hotel reviews on the formation of consumer consideration, and proposed that online reviews improve hotel awareness. Filieri and McLeay (2014) used the ELM to define the factors that derive the adoption of consumer reviews. In the tourism and hospitality industry, due to the intangible, experiential, and complex characteristics of products, consumers are confused to estimate the quality of products before experiencing products or services (Park & Nicolau, 2015). OTRs written by prior consumers enable travelers to gather detailed information, and many review websites allow consumers to vote on review useful in their decision making process (Liu & Park, 2015). Reviews with more useful votes offer greater confidence and credibility in their purchase decisions. Therefore, previous studies have a high interest in identifying the factors affecting review usefulness.

As a general agreement, several researchers asserted that review rating, counting word (review length), identity disclosure (real name, real photo and real location), review readability are significant factors to impact on review usefulness (Baek, Ahn, & Choi, 2012; Korfiatis et al., 2012; Liu & Park, 2015; Mudambi & Schuff, 2010; Racherla & Friske, 2012) However, the role of image (i.e., photos) format is rarely examined.

This research attempts to estimate the following two formats of online review related factors as independent variables: (1) text format aspects (i.e., review length, review readability) and (2) image format aspects (i.e., physical environment images, food & beverage images). Therefore, we hypothesize that:

*Hypothesis 1* As the number of words in a review text increases, a review's usefulness increases.

*Hypothesis 2* As the readability of the review text increases, a review's usefulness increases.

## ***2.2 Elaboration Likelihood Model and Presentation Format***

The ELM, a dual route theory, presents that the attitude towards a message is affected by source expertise, the largeness of the message, the mood of the message recipient, and diverse other contextual variables (Petty & Cacioppo, 1986). This model suggests that attitude changes are based on different levels of effortful information processing. A message is received through one of two routes of persuasion depending on the degrees of elaboration: the central route and the peripheral route (Park & Kim, 2008). A person with high motivation and the ability to process detailed information tend to be engaged in effortful cognitive activity through the central route (i.e., focal messages). However, individual with the lack of either motivation or ability to process a message, persuasion is derived from the peripheral route (i.e., mental heuristics).

Hence, several scholars have investigated information processes employing the ELM for the theoretical background of the online reviews framework (Baek et al., 2012; Park & Kim, 2008; Sher & Lee, 2009; Xu et al., 2015; Zhang, Ye, Law, & Li, 2010b). Baek et al. (2012) classified the factors that influence the review helpfulness into peripheral cues for heuristic information processing (e.g., rating inconsistency, reviewer ranking, reviewer's real name) and central cues for systematic information processing (e.g., word count, the percent of negative word). In this way, Xu et al. (2015) identified the text-based reviews as central cues and the video-based reviews as peripheral cues.

Most of current consumer-generated online reviews are presented in the text format. However, although, in the information systems (IS) settings, several research findings showed that visual presentation with peripheral cues can be more attractive and persuasive (Hong, Thong, & Tam, 2004; Weathers, Sharma, & Wood, 2007). Potential consumers will be able to confirm the verbal description

and decrease uncertainty by reviewing vividly presented images, along with textual messages. In the future, there will be a significant increase in postings of image or visual-based reviews (e.g., photo, video) due to the effect of image format reviews.

In the context of online review information processing, we posit that consumers may process review messages in both manners at the same time. Thus, given these different foci, we undertook a study to specifically explore the relative effects of image presentation formats (e.g., physical environment images, food & beverage images) articulated as peripheral cues on review usefulness, while text formats (e.g., review length, review readability) were articulated as central cues. In this study, we assumed that the text format is more related with the aspects of information systems, while the image format is the essential and vivid factors to confirming the restaurant settings in the tourism and hospitality context. We argued that the combined effects of the image format of food and physical environment on information processing such as review evaluation have also been little studied. Therefore, we hypothesized that:

*Hypothesis 3* As the number of physical environment images in a review increases, a review's usefulness increases.

*Hypothesis 4* As the number of food & beverage images in a review increases, a review's usefulness increases.

### ***2.3 The Moderating Roles of Restaurant Type and Self-image Disclosure***

Previous studies on tourism and hospitality have examined several elements as the possibility of a moderator. Ryu and Han (2010) conducted the moderating role of perceived price in the relationship between the quality of food, service, physical environment and customer satisfaction. In addition, Kim and Moon (2009) investigated the moderating role of restaurant type (i.e., casual vs. fine dining) with customers' response to the servicescape. Jin et al. (2012) also tested dining motivation as a moderator in the relationship between brand image and customer loyalty.

Restaurant type is an essential factor to influence the customers dining experience and information searching according to their dining motivation. Furthermore, it is closely related to the price of products or services. For instance, travellers on a specific memorable event (e.g., honeymoon) are likely to dine at a fine dining restaurant to be memorable, while backpackers tend to dine at a casual restaurant for a low price. Accordingly, restaurant type has relationships with perceived price and customers' motivation. Hwang and Ok (2013) defined both casual and fine dining restaurants: "a casual dining restaurant serves a casual atmosphere with the above average guest check of \$15, while a fine dining restaurant provides a luxurious atmosphere with the above average guest check of \$50"(p. 125).



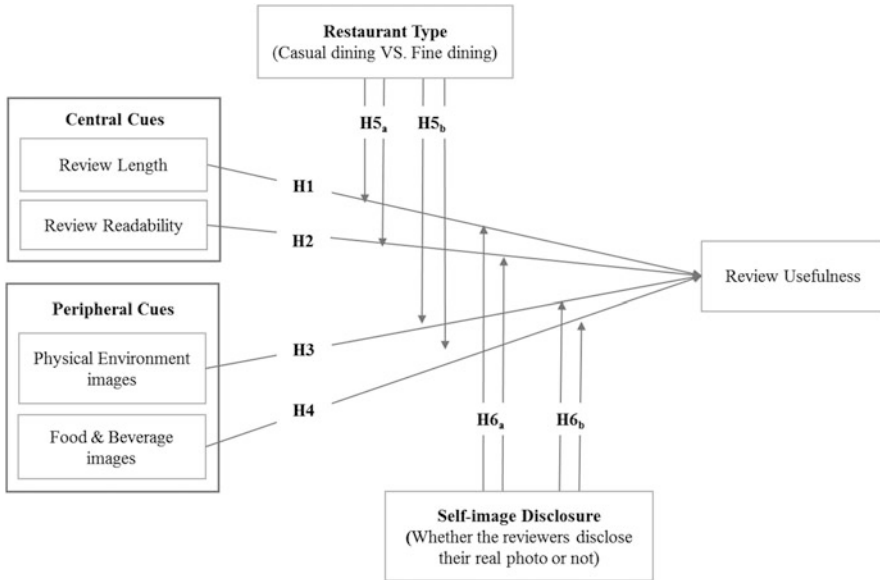
However, situational factors could influence subjects' preferences depending on types of products or services (Belk, 1975) and have a moderation effect on customers' responses in the servicescape. Because the situation derives a totally different impact to consumer behaviour (Kim & Moon, 2009), the situation constitutes a dominant determinant of behavioral influence. Kim and Moon (2009) explored the moderating role of the different type of theme restaurants towards customers' emotion and perceived service quality. Thus, we can assume that the different type of restaurant (i.e., fine dining, vs. casual dining restaurant) moderate the effect of review readers' emotion and perception of service quality on review usefulness.

The role of restaurant type has been rarely examined in OTRs research, even though restaurant type is a fundamental antecedent of customers' purchasing behaviour.

Scholars have identified that source identity disclosure is important in online interactions (Liu & Park, 2015; Racherla & Friske, 2012; Tidwell & Walther, 2002). Source identity disclosure (e.g. real name, photo and address) reduce uncertainty that arises from the lack of social cues (Tidwell & Walther, 2002). Liu and Park (2015) explored the impact of reviewer's identity disclosure such as real name, photo and address. They proposed that reviewers' identity disclosure has a significant impact on review usefulness. That is, reviews including identifiable information are evaluated as more useful. Reviewers' real photo is identified clear enough to verify their faces or provide no animations and screen shots (e.g., a scene, status) (Liu & Park, 2015). However, we assessed the impact of real photo among the indicators of reviewer's identity disclosure. Reviewers' real photo could be renamed 'self-image disclosure'. Thus, we can expect if a reviewer disclosed self-image or not moderate the effect of review usefulness.

In the restaurant environment, Kwun and Oh (2007) assessed the moderating role of self-image in the relationship between, purchase-related behavioural intentions and restaurant evaluation process. Moreover, Sirgy and Su (2000) found that self-image is a salient factor of traveller satisfaction with the destination. They suggested that social self-image was matched between the store and the patron's image. Personal and environmental factors tend to moderate the strength and direction on purchase behaviour. Bitner (1992) also argued that individual personality facets may affect customers' reaction to their physical surroundings and identify personal characteristics (e.g., appearance, images) as one of the salient response moderators. In an online reviews setting, reviewers can post their own photo self-image. According to Bitner's (1992) findings, potential consumers can perceive the patron's image (e.g., personnel environment of restaurant) through the reviewer's real photo. We assumed that reviewer's real photo may tend to moderate the perception of potential consumer in review usefulness. Therefore, we suggest the following hypothesis:

*Hypothesis 5a* Text formats (review length, review readability) of online travel reviews have stronger effects on review usefulness in a casual dining restaurant type than in a fine dining restaurant type.



**Fig. 1** Proposed research model

*Hypothesis 5b* Image formats (physical environment images, food & beverage images) of online travel reviews have stronger effects on review usefulness in a casual dining restaurant type than in a fine dining restaurant type.

*Hypothesis 6a* Text formats (review length, review readability) of online travel reviews have stronger effects on review usefulness without reviewer’s real photo than with it.

*Hypothesis 6b* Image formats (physical environment images, food & beverage images) of online travel reviews have stronger effects on review usefulness without reviewers’ real photo than with it.

We proposed our research model based on online travel reviews and put the moderating roles (restaurant type vs. self-image disclosure) of between independent variables and dependent variable in Fig. 1.

### 3 Research Methodology

#### 3.1 Data Source and Sampling

All the data used for this study was from the 2nd quarter of 2015 posted on Yelp.com, which is July 2015. The largest data pool among total 83 million reviews was the restaurant related reviews under the category of tourism and hospitality

products on Yelp.com (Yelp.com, 2015a). This website has been known as one of the most famous online restaurant review sites where a considerable size of data pool can be viewed. On Yelp.com, we selected the fine restaurant located in New York City (NYC), the U.S., which has been the most fast-growing city in leisure and hospitality. Also, the food price of the selected fine dining restaurant was more than \$50 which was established as the standard price of the fine restaurants in Hwang and Ok (2013)'s research. Based on this information, we randomized the order of the lists using the 'Best match,' which is provided by Yelp.com to control the list of restaurants in a specific order. From these randomized lists, we selected the one restaurant that is both awarded as Michelin three stars and the top-ranked restaurant on the first web page. Ottenbacher and Harrington (2007) pointed out that the Michelin three star restaurants affect the consumers' choice of fine dining restaurants and they are one of most respected ranking systems (Johnson, Surlemont, Nicod, & Revaz, 2005). On the other hand, for casual dining restaurants, our research data was collected at 'Yelp's Top 100 Places to Eat in the U.S.' for 2015 because of their reliability and validity. It is known that the Yelp.com selected the most famous 100 restaurants by investigating the frequency of online reviews throughout the year (Yelp.com, 2015b). To extract a consistent number of reviews with fine dining restaurants, we selected two casual dining restaurants in the 'Yelp's Top 100 Places to Eat in the U.S.' As a result, we obtained 1323 reviews of casual dining restaurants, and 1306 reviews of fine dining restaurants for this research.

### ***3.2 Operationalization of Data Variables***

Table 1 presents the operational terms of the variables adopted from the previous research on online reviews.

### ***3.3 Results of Variable Data Collection and Measurement***

The data collection and measurement for review length and review usefulness are performed by employing the Web-harvesting (i.e., web-crawling) technique. In addition, review readability was measured by using the tool posted on the website '[www.readability-score.com](http://www.readability-score.com).' For the moderator variables, the real photo, which is a binary variable, was manually coded as '1' if the reviewer of each review disclose their face on Yelp.com, and otherwise, '0.' Casual dining restaurant was coded as '0,' while '1' for fine dining restaurants. For the physical environment and food & beverage images, they were manually collected, and a manual content analysis was conducted to measure. The average value of all variables for fine dining restaurants is larger than casual dining restaurants with the exception of real photo.

**Table 1** Operationalization of variables

Variable	Operationalization of data variables	References
Review length	The number of total words in each review	Liu and Park (2015)
Review readability	The degree of individual comprehensibility in each review. To test the readability, the Automate Readability Index (ARI) was examined.	Park and Nicolau (2015)
Physical environment images	The number of images including the facility aesthetics, layout, table settings, and staff.	Ryu and Han (2011)
Food & Beverage Images	The number of images including the food or drink that cooked in restaurant	Eliwa (2006)
Review usefulness	The number of total useful votes in each review	Ghose and Ipeirotis (2011)
Self-image disclosure	Whether or not the reviewers of each review disclose their real photo which is clear enough to identify their faces.	Liu and Park (2015)
Casual dining restaurants	The restaurants with a casual atmosphere and customers pay moderate price at \$15	Hwang and Ok (2013)
Fine dining restaurants	The restaurants with an elegant, luxurious atmosphere and customers pay a relatively high price at \$50	Hwang and Ok (2013)

## 4 Results

### 4.1 Data Analysis

For the data analysis, we utilized the Tobit regression analysis model, considering the nature of dependent variables. The distribution of dependent variables showed that about 53.9 % ( $n = 1417$ ) of dependent variables showed left-censored. Also, the Tobit model is effective to estimate non-negative dependent variables (Mudambi & Schuff, 2010). As not all the online review readers vote for usefulness, it is possible to receive zero response by not answering as to whether the review was useful or not (Mudambi & Schuff, 2010). However, the Tobit model considers the zero vote as a real value which can contribute to solving the selection bias (Kennedy, 1994).

### 4.2 Hypothesis Testing

To test the direct effect of central and peripheral cues and also the moderator effect of restaurant type and real photo, we executed the simple regression with each independent variable alone to see the main effects of independent variables. In addition, the stepwise regression analysis was executed by the Baron and Kenny (1986)'s three step procedure.

As a results, we confirmed that central and peripheral cues have a positive effect on review usefulness supporting the H1 ( $\beta = 0.023$ ,  $t = 18.823$ ), H2 ( $\beta = 0.327$ ,

**Table 2** Results of Tobit regression and moderator effects of restaurant type

	Step	Variable	Coef.	Std. err.	t-value	Pseudo R <sup>2</sup>
Review length	Step 1	Review Length	0.015	0.001	23.680***	0.059
	Step 2	Review Length	0.015	0.001	23.167***	
		Restaurant Type	-0.294	0.235	-1.254	
	Step 3	Review Length	0.023	0.001	18.823***	0.065
		Restaurant Type	1.479	0.327	4.520***	
Review Length × Restaurant Type		-0.011	0.001	-7.676***		
ARI	Step 1	ARI	0.343	0.042	8.141***	0.007
	Step 2	ARI	0.306	0.044	6.898***	0.008
		Restaurant Type	0.677	0.268	2.527***	
	Step 3	ARI	0.330	0.069	4.782***	0.008
		Restaurant Type	0.883	0.528	1.672	
ARI × Restaurant Type		-0.041	0.090	-0.453		
PE <sup>a</sup>	Step 1	PE	0.199	0.038	5.221***	0.003
	Step 2	PE	0.190	0.038	4.983***	0.005
		Restaurant Type	1.219	0.254	4.804***	
	Step 3	PE	1.762	0.225	7.825***	0.011
		Restaurant Type	1.503	0.253	5.937***	
PE × Restaurant Type		-1.618	0.228	-7.086***		
F&B <sup>b</sup>	Step 1	F&B	0.175	0.017	10.033***	0.011
	Step 2	F&B	0.171	0.017	9.865***	0.013
		Restaurant Type	1.171	0.249	4.713***	
	Step 3	F&B	0.801	0.054	14.866***	0.029
		Restaurant Type	2.021	0.250	8.098***	
F&B × Restaurant Type		-0.699	0.057	-12.364***		

Note: Significance:  $p < 0.001$ \*\*\*

<sup>a</sup>PE Physical Environment

<sup>b</sup>F&B Food & beverage

$t = 4.684$ ), H3 ( $\beta = 1.762, t = 7.825$ ) and H4 ( $\beta = 0.801, t = 14.866$ ) as shown in Tables 2 and 3. In addition, we analysed interaction term to test moderator effects. First, the results of moderator effects of restaurant type showed that all of the interaction term excluding the ARI showed significant level at  $p < 0.001$ . Also, coefficient value for interaction terms of each independent variable was negative. It indicates that the impacts of the independent variables on fine dining restaurants are less than casual restaurants. So, the review length ( $\beta = -0.011, t = -7.676$ ), physical environment images ( $\beta = -1.618, t = -7.086$ ) and food & beverage images ( $\beta = -0.699, t = -12.364$ ) have more positive effect on review usefulness for casual dining restaurants partially supporting H5<sub>a</sub> and H5<sub>b</sub>.

**Table 3** Results of Tobit regression and moderator effects of real photo

	Step	Variable	Coef.	Std. err.	t-value	Pseudo R <sup>2</sup>
Review length	Step1	Review length	0.015	0.001	23.680***	0.059
	Step2	Review length	0.014	0.001	22.803***	
		Self-image disclosure	2.162	0.230	9.404***	
	Step 3	Review length	0.013	0.001	13.044***	0.068
		Self-image disclosure	1.986	0.325	6.115***	
		Review length × Self-image disclosure	0.001	0.001	0.761	
ARI	Step 1	ARI	0.343	0.042	8.141***	0.007
	Step 2	ARI	0.325	0.041	7.862***	0.021
		Self-image disclosure	2.859	0.255	11.204***	
	Step 3	ARI	0.300	0.063	4.755***	0.021
		Self-image disclosure	2.628	0.506	5.193***	
		ARI × Real photo	0.044	0.083	0.527	
PE <sup>a</sup>	Step 1	PE	0.199	0.038	5.221***	0.003
	Step 2	PE	0.174	0.037	4.664***	0.016
		Self-image disclosure	2.859	0.256	11.164***	
	Step 3	PE	1.670	0.304	5.501***	0.019
		Self-image disclosure	3.058	0.258	11.832***	
		PE × Self-image disclosure	-1.519	0.306	-4.966***	
F&B <sup>b</sup>	Step 1	F&B	0.175	0.017	10.033***	0.011
	Step 2	F&B	0.156	0.017	9.089***	0.023
		Self-image disclosure	2.676	0.252	10.615***	
	Step 3	F&B	0.494	0.067	7.333***	0.026
		Self-image disclosure	2.945	0.257	11.458***	
		F&B × Real photo	-0.361	0.070	-5.198***	

Note: Significance:  $p < 0.001$ \*\*\*

<sup>a</sup>PE Physical environment

<sup>b</sup>F&B Food & beverage

In addition, the results of moderator effects of real photo showed that the only interaction term of peripheral cues (i.e., physical environments, food & beverage images) was significant at  $p < 0.001$  and the coefficient value of their interaction terms was also negative. It means that if reviewers disclose their faces, the effects of physical environment images and food & beverage images on review usefulness were lessened. Therefore, the results supported H6<sub>b</sub>, that the real photo moderates the effect of physical environment images ( $\beta = -1.519, t = -4.966$ ) and food & beverage images ( $\beta = -0.361, t = -5.198$ ) on review usefulness respectively (see Table 3).

## 5 Conclusions and Limitations

In this paper, we present a theory-grounded model which investigates the effects of central text cues and peripheral image cues on consumer perceptions of review usefulness, and validate hypotheses with real-world data from Yelp.com. The findings provide several contributions to the literature and practices of online reviews in tourism and hospitality context. First, we study the effect of two presentation formats of OTRs on consumer perception of review usefulness, which is one of the first empirical attempts. We found that both text and image formats have significant positive influences on consumer perception which mainly gives the theoretical explanation from the perspective of ELM. Our study highlights that especially peripheral image formats, may contain enough information to guide decision-making for purchase tourism related products.

Second, we focus exclusively on image cues that verify physical environment and food & beverage of restaurant experience, as opposed to the majority of the previous studies that have investigated text cues such as review length and readability. The findings of this study contribute future study develop diverse use of image formats to enhance the usability of online review sites. Moreover, this study uses data from real online behavior as opposed to methods such as surveys and experimentation used, this study could fill the gap to an extent hospitality marketing studies that have been approached from the consumers' perception. Third, this is one of the first studies examining the moderating roles of restaurant type and reviewers' self-image disclosure. All the factors of independent, excepting for review readability, have stronger effects on review usefulness in the casual dining restaurant type than in the fine dining restaurant type. From the text format prospective, review length of OTRs in the casual dining restaurant type has a stronger effect on review usefulness, while review readability does not. As a general agreement, review length has a positive influence on review usefulness or helpfulness (Liu & Park, 2015; Mudambi & Schuff, 2010; Racherla & Friske, 2012). While, although there are several measures for calculating readability (i.e., FRE, CLI, ARI, FOG), the results of these measurements on review usefulness are mixed (Liu & Park, 2015). In this study, even though, the moderating effect of restaurant type is not significant in the relationship between review readability and review usefulness. However, review readability has a direct effect on review usefulness. Further, we explored the moderating role of reviewer's self-image disclosure. The findings present that image formats have a stronger effect on review usefulness without reviewer's self-image. Reviewer's real photo, another image peripheral cue in the online review contexts, plays a moderator role in the image format's influence on usefulness. However, we can assume that restaurant type, the most important factor of restaurant choice, is a central cue which plays the moderator role in both central and peripheral cues' impacts on review usefulness. Concerning the practical implications, the image format enables to reinforce the consumer perception, especially physical environment and food & beverage images are important factors for review usefulness. Therefore, restaurant managers and

marketers should recognize the importance of image reviews and devote the greatest effort and resources to prepare high quality of food and environment. With the competitive online business environment, the findings help to develop the operation of consumer information processing. Organizers of tourism review websites should stimulate reviewer to disclose his/her self-image and image format reviews, even though image format information is a peripheral route of consumer information processing. This study also has several limitations. We focused only on one type of business service, the restaurant business. Thus, in future research, it is necessary to extend this empirical study to other types of tourism services such as hotels and destinations. In this paper, it is overlooked that multi-aspects of review attributes such as real address and name, reviewers' reputation, star rating (Forman et al., 2008; Ghose & Ipeiritos, 2011; Liu & Park, 2015; Racherla & Friske, 2012), past experience (Ghose & Ipeiritos, 2011) and negative word (Baek et al., 2012) can play an important role on review usefulness. Moreover, as several researchers pointed out that review usefulness and enjoyment fail to reflect other customers' opinion, who did not vote (Baek et al., 2012; Racherla & Friske, 2012), it is needed to design a survey or experimental research to overcome this limitation in future research.

## References

- Baek, H., Ahn, J., & Choi, Y. (2012). Helpfulness of online consumer reviews: Readers' objectives and review cues. *International Journal of Electronic Commerce*, 17(2), 99–126.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Belk, R. W. (1975). Structural variables and consumer behavior. *Journal of Consumer Research* (December), 2, 157–164.
- Eliwa, R. (2006). *A study of customer loyalty and the image of the fine dining Restaurant*. Unpublished Master's thesis. Cairo—Egypt: Oklahoma State University
- Filieri, R., & McLeay, F. (2014). E-WOM and accommodation: An analysis of the factors that influence travelers' adoption of information from online reviews. *Journal of Travel Research*, 53(1), 44–57.
- Fogg, B. J., Marshall, J., Laraki, O., Osipovich, A., Varma, C., Fang, N., & Treinen, M. (2001, March). *What makes web sites credible? A report on a large quantitative study*. Paper presented at the SIGCHI Conference on Human Factors in Computing Systems, New York.
- Forman, C., Ghose, A., & Wiesenfeld, B. (2008). Examining the relationship between reviews and sales: The role of reviewer identity disclosure in electronic markets. *Information Systems Research*, 19(3), 291–313.
- Ghose, A., & Ipeiritos, P. G. (2011). Estimating the helpfulness and economic impact of product reviews: Mining text and reviewer characteristics. *IEEE Transactions on Knowledge and Data Engineering*, 23(10), 1498–1512.
- Hong, W., Thong, J. Y., & Tam, K. Y. (2004). Does animation attract online users' attention? The effects of flash on information search performance and perceptions. *Information Systems Research*, 15(1), 60–86.



- Hwang, J., & Ok, C. (2013). The antecedents and consequence of consumer attitudes toward restaurant brands: A comparative study between casual and fine dining restaurants. *International Journal of Hospitality Management*, 32, 121–131.
- Jeong, E., & Jang, S. S. (2011). Restaurant experiences triggering positive electronic word-of-mouth (eWOM) motivations. *International Journal of Hospitality Management*, 30(2), 356–366.
- Jin, N., Lee, S., & Huffman, L. (2012). Impact of restaurant experience on brand image and customer loyalty: Moderating role of dining motivation. *Journal of Travel & Tourism Marketing*, 29(6), 532–551.
- Jin, Y., Yang, S. B., Rhee, C., & Lee, K. Y. (2013, June). *An Exploratory Study of the Effects of Price Decreases on Online Product Reviews: Focusing on Amazon's Kindle 2*. Paper presented at the PACIS, Jeju Island, South Korea.
- Johnson, C., Surlmont, B., Nicod, P., & Revaz, F. (2005). Behind the stars: A concise typology of Michelin restaurants in Europe. *Cornell Hotel and Restaurant Administration Quarterly*, 46(2), 170–187.
- Kennedy, P. (1994). *A guide to econometrics* (3rd ed.). Oxford—England: Blackwell.
- Kim, W. G., & Moon, Y. J. (2009). Customers' cognitive, emotional, and actionable response to the servicescape: A test of the moderating effect of the restaurant type. *International Journal of Hospitality Management*, 28(1), 144–156.
- Korfatis, N., García-Bariocanal, E., & Sánchez-Alonso, S. (2012). Evaluating content quality and helpfulness of online product reviews: The interplay of review helpfulness vs. review content. *Electronic Commerce Research and Applications*, 11(3), 205–217.
- Kwun, D. J. W., & Oh, H. (2007). Past experience and self-image in fine dining intentions. *Journal of Foodservice Business Research*, 9(4), 3–23.
- Liu, Z., & Park, S. (2015). What makes a useful online review? Implication for travel product websites. *Tourism Management*, 47, 140–151.
- Mudambi, S. M., & Schuff, D. (2010). What makes a helpful review? A study of customer reviews on Amazon.Com. *MIS Quarterly*, 34(1), 185–200.
- Ottenbacher, M., & Harrington, R. J. (2007). The innovation development process of Michelin-starred chefs. *International Journal of Contemporary Hospitality Management*, 19(6), 444–460.
- Park, D. H., & Kim, S. (2008). The effects of consumer knowledge on message processing of electronic word-of-mouth via online consumer reviews. *Electronic Commerce Research and Applications*, 7(4), 399–410.
- Park, D. H., Lee, J., & Han, I. (2007). The effect of on-line consumer reviews on consumer purchasing intention: The moderating role of involvement. *International Journal of Electronic Commerce*, 11(4), 125–148.
- Park, S., & Nicolau, J. L. (2015). Asymmetric effects of online consumer reviews. *Annals of Tourism Research*, 50, 67–83.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology*. New York: Springer.
- Racherla, P., & Friske, W. (2012). Perceived 'usefulness' of online consumer reviews: An exploratory investigation across three services categories. *Electronic Commerce Research and Applications*, 11(6), 548–559.
- Rhee, H. T., & Yang, S. B. (2015a). How does hotel attribute importance vary among different travelers? An exploratory case study based on a conjoint analysis. *Electronic Markets*, 25(3), 211–226.
- Rhee, H. T., & Yang, S. B. (2015b). Does hotel attribute importance differ by hotel? Focusing on hotel star-classifications and customers' overall ratings. *Computers in Human Behavior*, 50, 576–587.
- Ryu, K., & Han, H. (2010). Influence of the quality of food, service, and physical environment on customer satisfaction and behavioural intention in quick-casual restaurants. *Journal of Hospitality & Tourism Research*, 34(3), 310–329.

- Ryu, K., & Han, H. (2011). New or repeat customers: How does physical environment influence their restaurant experience? *International Journal of Hospitality Management*, 30(3), 599–611.
- Schuckert, M., Liu, X., & Law, R. (2015). Hospitality and tourism online reviews: Recent trends and future directions. *Journal of Travel & Tourism Marketing*, 32(5), 608–621.
- Sher, P. J., & Lee, S. H. (2009). Consumer skepticism and online reviews: An elaboration likelihood model perspective. *Social Behavior and Personality*, 37(1), 137–144.
- Sirgy, J., & Su, C. (2000). Destination image, self-congruity, and travel behavior: Toward an integrative model. *Journal of Travel Research*, 38(4), 340–352.
- Sparks, B. A., & Browning, V. (2011). The impact of online reviews on hotel booking intentions and perception of trust. *Tourism Management*, 32(6), 1310–1323.
- Tidwell, L., & Walther, J. (2002). Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations: Getting to know one another a bit at a time. *Human Communication Research*, 28(3), 317–348.
- Vermeulen, I. E., & Seegers, D. (2009). Tried and tested: The impact of online hotel reviews on consumer consideration. *Tourism Management*, 30(1), 123–127.
- Weathers, D., Sharma, S., & Wood, S. L. (2007). Effects of online communication practices on consumer perceptions of performance uncertainty for search and experience goods. *Journal of Retailing*, 83(4), 393–401.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179–188.
- Ye, Q., Law, R., Gu, B., & Chen, W. (2011). The influence of user-generated content on traveler behavior: An empirical investigation on the effects of e-word-of-mouth to hotel online bookings. *Computers in Human Behavior*, 27, 634–639.
- Yelp. (2015a). An introduction to Yelp. Retrieved July 12, 2015, from <http://www.yelp.com>
- Yelp. (2015b). Yelp's top 100 places to eat in the U.S. for 2015. Retrieved July 12, 2015, from <http://officialblog.yelp.com/2015/01/yelps-top-100-places-to-eat-in-the-us-for-2015.html>
- Zhang, Z., Lee, M. K., & Zhao, S. J. (2010a, August). *Understanding the informational social influence of online review platforms*. Paper presented at the ICIS, Kaminoyama, Japan.
- Zhang, Z., Ye, Q., Law, R., & Li, Y. (2010). The impact of e-word-of-mouth on the online popularity of restaurants: A comparison of consumer reviews and editor reviews. *International Journal of Hospitality Management*, 29, 694–700.

# How Far, How Near Psychological Distance Matters in Online Travel Reviews: A Test of Construal-Level Theory

Seunghun Shin, Namho Chung, Doyong Kang, and Chulmo Koo

**Abstract** An online travel review is regarded as more important than a general product review due to the tourism product's intangibility. This study's objective is to explore the effect of online travel reviews' usefulness to the tourist's perception using the construal-level theory (CLT). For this goal, online travel reviews are divided based on the review content characteristics, and the review usefulness of two different online reviews is compared using the temporal distance. The results show that the near future tourists are more influenced by concrete reviews than abstract reviews; however, the far future tourists are more influenced by abstract reviews than concrete reviews. Based on the results, the theoretical and practical implications are discussed, and future research directions follow based on the limitations.

**Keywords** Online travel review • Review usefulness • Construal-level theory • Temporal distance • Concrete review • Abstract review

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## 1 Introduction

An online review removes consumers' concerns regarding the limitations of time and distance to find a huge quantity of reliable information (Wang, Yu, & Fesenmaier, 2002); thus, the online review is considered a crucial communication channel. Generally, the importance of an online review is higher, particularly in the tourism industry due to the intangibility of the tourism product (Litvin, Goldsmith, & Pan, 2008). The prominence of the online travel review vitalizes the emergence of eMediary (Buhalis & Licata, 2002), which is an online review website that specializes in travel experiences (Vermeulen & Seegers, 2009). The review platform has become a main gateway of travel-related information for potential tourists as well as an essential marketing channel for global destinations (Xiang & Gretzel, 2010). As the importance of online travel review is being recognized, a number of studies regarding online travel reviews have been conducted with a variety of purposes in various settings (Liu & Park, 2015; Mudambi & Schuff, 2010; Racherla & Friske, 2012; Vermeulen & Seegers, 2009; Ye, Law, & Gu, 2009). Although many studies conduct research in terms of online travel reviews, the influence of review usefulness on the traveler's perception has been sparsely investigated. Additionally, few studies verify the construal-level theory (CLT), which describes an individual's mental interpretation process (Dhar & Kim, 2007), in the tourism context. Therefore, the purpose of this study is to examine the impact of online travel review's usefulness based on CLT. For this goal, this research separates online travel reviews into two different types, concrete online travel reviews and abstract online travel reviews. Then, the review usefulness of each review is compared with the temporal distance, adopted from CLT. In the literature review, the previous research of online travel reviews and CLT is examined, and the hypotheses and research model are proposed. In the methodology, the research design, the measurement development and the data collection are explained, and research results are provided. After the interpretation of research results, theoretical and practical implications are discussed; finally, research limitations and propositions for future research are suggested.

## 2 Literature Review

### 2.1 *Online Travel Review*

The influences of online reviews are increasing because customers tend to perceive the information made by actual buyers of the products as more reliable (Herr, Kardes, & Kim, 1991). As virtual communities and travel review websites are gaining popularity, more tourists describe, share, and relive their travel experiences through internet channels (Tussyadiah & Fesenmaier, 2009). In fact, Gretzel and Yoo (2008) find that online travel reviews have significant influences on tourists'

decisions, particularly regarding accommodation. This trend can be explained by the intangible tourism products that are difficult to evaluate before consumption, in this case, the actual travel experience (Litvin et al., 2008). Thus, the impacts of online travel reviews are examined with a variety of research themes. Ye et al. (2009) find a positive correlation between the online hotel review and the business performance of hotels. Vermeulen and Seegers (2009) argue that the exposure to online reviews regarding a specific hotel increases the possibility that the hotel will be included in the consumer's consideration set. Recently, many studies analyze review usefulness to ascertain the significant traits of online reviews for their usefulness. The review usefulness is conceptualized to explain the influences of online reviews on the consumer's perception or behavior (Chen & Xie, 2008). Racherla and Friske (2012) compare the impacts of messenger factors and message factors of online reviews to review usefulness. Liu and Park (2015) examine the influences of various traits included in online reviews (i.e., identity disclosure, expertise, reputation, review star rating, review length, customer perceived enjoyment, and review readability) to review usefulness in a restaurant setting. Mudambi and Schuff (2010) determine the effects of customer review's review extremity and review depth to review helpfulness in different conditions, online reviews for search goods and online reviews for experience goods. Despite a number of studies on review usefulness, the research investigating the influence of review usefulness on the reader's perception or behavioral intention is rarely conducted in the tourism context. Therefore, this study will fill this gap by evaluating the impact of online travel review usefulness on the tourist's expectation and visit intention.

## 2.2 *Construal-Level Theory*

The CLT explains an individual's mental interpretation process (Dhar & Kim, 2007). CLT argues that people tend to have a low-level construal regarding the stimulus perceived as psychologically close; conversely, individuals are likely to have a high-level construal regarding the psychologically far stimulus (Dhar & Kim, 2007). In the theory, psychological distance is conceptualized as a subjective experience in which an object or event is close or far in the temporal dimension, spatial dimension, or social dimension (Liberman & Trope, 1998). Few researchers develop a theory through the integration of psychological distance with an individual's preference (Trope, Liberman, & Wakslak, 2007). The researchers argue that if an individual recognizes the near future event, he or she would prefer concrete information because of his or her low-level construal regarding the event; however, if an individual recognizes the far future event, he or she would prefer abstract information because of his or her high-level construal regarding the event (Liberman & Trope, 1998). Certain tourism studies demonstrate these propositions of CLT. Walmsley and Jenkins (1992) find that tourists are likely to use more abstract features than the destination's residents to perceive the destination

attractions due to the visitor's high-level construal resulting from the far spatial distance. Similarly, Young (1999) confirms that the preferences of international travelers for abstract destination information are higher than those of domestic travelers because of the difference in spatial distance between the foreigners and local people. In fact, such propensities can be understood using the uncertainty reduction theory (URT) as well, which explains the human behavior of interpersonal communication (Berger & Calabrese, 1975). Among the seven axioms suggested in the URT, axiom 3 proposes that a high level of uncertainty triggers an increase in information search behavior (Berger & Calabrese, 1975). As the URT is being confirmed with the concept of motivation, Kellermann and Reynolds (1990) supplements axiom 3 by indicating that the information seeking behavior is caused by how much an individual wants to know rather than by how much an individual knows. Moreover, people may demand different types of information depending on how much they want to know, in other words, how much they are involved (Kellermann & Reynolds, 1990). Consequently, according to CLT and URT, it is propositioned that individuals' desire for different types of information depends on their particular situation. The tourism research verifying CLT is rarely achieved; moreover, the few studies that proved CLT in the tourism context primarily focus on the spatial dimension of psychological distance. Therefore, this study will relieve the biased trend by applying the temporal dimension to the influence of online travel review helpfulness.

### 3 Research Model and Hypotheses

**Concrete Review Usefulness, Abstract Review Usefulness, and Expectation** Although the importance of an online travel review is highly recognized, the extent of an online review's impact can be different depending on the content characteristic (Li, Huang, Tan, & Wei, 2011). Concrete online reviews provide precise and detailed content that focuses on exact facts and objective information; however, abstract online reviews provide abstract and emotional content that focus on individual experience and subjective information (Li et al., 2011). By borrowing and modifying the operationalization of online reviews in the previous research (Li et al., 2011), a concrete online travel review (concrete review) and abstract online travel review (abstract review) are defined as follows.

A concrete review is an online review written by an actual traveler about a specific travel attraction, including the precise and detailed content with exact fact and objective information (Li et al., 2011).

An abstract review is an online review written by an actual traveler about a specific travel attraction, including the abstract and emotional content with specific experience and subjective information (Fig. 1) (Li et al., 2011).

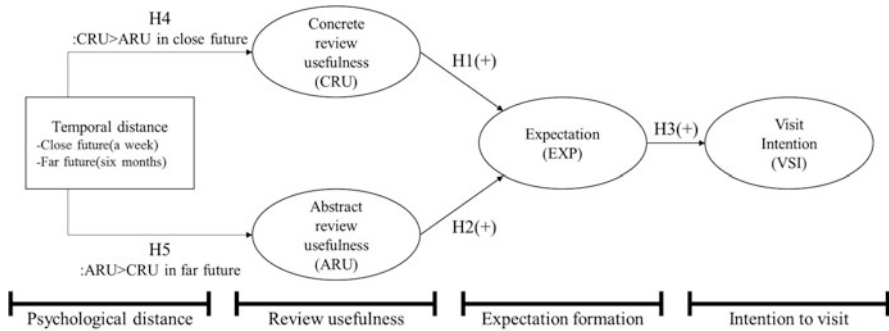


Fig. 1 Research model

According to the model that explains the nature and determinants of a customer’s expectations of service, word-of-mouth communication is an important determinant in shaping expectations regarding service because the personal or non-personal statements from the people who experienced the service inform future consumers of what they can expect by describing the service (Zeithaml, Berry, & Parasuraman, 1993). Because the online travel reviews are written from tourists’ perspectives, the reviews provide the readers with indirect travel experience, and this can make the online travel reviews be influential factors in formulating the expectation regarding the travel (Bickart & Schindler, 2001). Based on the abovementioned studies’ results, this research is hypothesized as follows:

*H1* The concrete review usefulness has a positive impact on the expectation.

*H2* The abstract review usefulness has a positive impact on the expectation.

**Expectation and Visit Intention** The relation between expectation and intention is verified in a variety of research studies. Typically, Prothero and Beach (1984) examine the expectation-intention-action chain regarding the decision making process for retirement, which means that the expectation is an effective predictive factor of intention. Thus, this study will confirm the expectation-intention relation from an online travel review perspective. Therefore, a hypothesis is proposed as follows:

*H3* The expectation has a positive impact on the visit intention.

**Different Influences of Online Travel Reviews based on Temporal Distance** According to the research based on CLT with an individual’s information preference, an individual is likely to prefer concrete information when he or she perceives a near future event and vice versa (Liberman & Trope, 1998). Additionally, URT argues that the type of information that individuals want to obtain depends on their involvement or situation. Moore and Harris (1996) maintain that the different types of information distinguished based on the content characteristic can be perceived differently depending on the information receiver’s

situation. Additionally, the influences of different types of online reviews on the customer expectation are proved in the hotel context, which means the expectation level of a potential visitor varies according to the hotel review's valence (Mauri & Minazzi, 2013). Thus, it is supposed that the different types of online travel reviews will be perceived differently, depending on the reader's different temporal distance. Therefore, this study hypothesizes the following:

*H4* For the near future tourists (the travelers who will travel in a week), the influence of a concrete review on the expectation is more significant than that of abstract reviews.

*H5* For the far future tourists (the travelers who will travel in six months), the influence of an abstract review on the expectation is more significant than that of concrete reviews.

## 4 Research Methodology

**Research Design** The main purpose of this study is to examine the two different types of online reviews' influences on the expectation with temporal distance. For this goal, this research conducts an experimental survey to compare the review usefulness of online travel reviews perceived by near and far future tourists. The survey participants are the potential tourists who already booked a package tour, a Guam package tour. The potential tourists are separated into near future tourists who will travel in a week and far future tourists who will travel in 6 months or more. The separation is performed based on the interval between participants' departure date of their tour and the survey date. Both future tourist groups are assigned to complete a questionnaire including both a concrete review and an abstract review that describes a specific destination in Guam, called Two Lovers Point. The questionnaire requests the review usefulness of each review, the expectation regarding travel and the intention to visit the place.

**Measurements** The concrete reviews and abstract reviews used for the survey are created based on the operational definition of each review (Li et al., 2011) by modifying the online travel reviews, which were uploaded onto the most famous website in South Korea ([www.naver.com](http://www.naver.com)). To ensure the validity of the different review's effect triggered by the review content characteristic, the homogeneity is maintained by setting the number of words, number of pictures and frame of reviews similarly except for the nuance of the review content. The measurements to evaluate the review usefulness are derived from the previous studies that investigate the information diagnosticity, which is a basic concept of review usefulness (Jiang & Benbasat, 2007). The questions regarding the expectation and visit intention are derived from the literature exploring the online review's influence in an e-commerce context (Gefen, 2000; Lee & Kim, 2012). Consequently, 10 questions are used for the survey: review usefulness (four questions),



expectation (three questions), and visit intention (three questions). A 7-point Likert scale is used for all of the measurement items, meaning 1 = *not at all* and 7 = *absolutely*.

**Data Collection** The paper survey is conducted with the assistance of Redcap Tour, one of the famous travel agency companies in South Korea. The questionnaires are distributed to the future tourists, who booked a package tour in advance. The five tour operators of the company, of which one is this study's researcher, perform the interview as a face-to-face survey. Because the respondents are recruited during the counselling time, the interviews are performed one-on-one or in groups at the company. Based on the departure date, the participants are divided into near future tourists and far future tourists. The period of time for the survey is approximately one month, from April 1, 2015, to May 12, 2015, and 275 responses of 300 questionnaires were finally selected. For near future tourists, a total of 131 participants' answers are used; conversely, 144 answers are from far future tourists.

According to Table 1, there is no considerable gap between males and females in both groups. The percentages of participants in their twenties and thirties are approximately 80 % in both groups. Regarding marital status, there are more married participants than single participants in both groups. Most of the participants graduated from a university in the near future group and far future group approximately half of participants in both groups earn over two million but under three million Korean won per month. The office workers represent the largest proportion in both data sets. In both groups, an even distribution is shown regarding past overseas travel experience excluding participants who have not been to foreign countries. Regarding the usage degree of online travel reviews, approximately 90 % of participants respond that they read online travel reviews to prepare for their travel more than normal.

## 5 Data Analysis and Results

**Analysis Method** Partial least squares (PLS) analysis is performed in this study. PLS is considered a casual modelling technique used for theory testing (Kim, Chung, Lee, & Kim, 2012). Furthermore, PLS is particularly appropriate for studies with small sample sizes, and it has a low concern regarding proposing unreasonable solutions (Hulland, 1999). Therefore, this study conducts data analysis using a PLS technique with Smart PLS version 2.0.

**Measurement Model** Because the data are derived from the different samples, the process for confirming the validity of measurements is executed separately for each group. To verify the absence of common method bias, exploratory factor analysis is conducted based on the Harman's single-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). As indicated in Table 2, four factors are aggregated separately

**Table 1** Demographic Information of near future tourists and far future tourists

Demographic variables		Near future		Far future	
		Frequency	%	Frequency	%
Gender	Male	63	48.1	74	51.4
	Female	68	51.9	70	48.6
Age	20s	53	40.5	53	36.8
	30s	50	38.2	62	43.1
	40s	22	16.8	23	16.0
	50s	6	4.6	5	3.5
Marital status	Single	45	34.4	50	34.7
	Married	86	65.6	94	65.3
Education	High school	1	0.8	1	0.7
	2-year college	8	6.1	6	4.2
	University	107	81.7	119	82.6
	Graduate school	15	11.5	17	11.8
Monthly income	Equal or less than KR ₩999,000	5	3.8	5	3.5
	KR₩1,000,000–KR ₩1,999,000	35	26.7	39	27.1
	KR₩2,000,000–KR ₩2,999,000	57	43.5	64	44.4
	KR₩3,000,000–KR ₩3,999,000	19	14.5	22	15.3
	KR₩4,000,000–KR ₩4,999,000	10	7.6	10	6.9
	Equal or more than KR ₩5,000,000	4	3.1	3	2.1
Occupation	Student	1	0.8	1	0.7
	Office worker	71	54.2	79	54.9
	Sales and service	44	33.6	50	34.7
	Technician	4	3.1	3	2.1
	Professional	6	4.6	6	4.2
	Civil servant	1	0.8	0	0
	Homemaker	1	0.8	0	0
	Other	3	2.3	5	3.5
Overseas travel experiences	Not at all	2	1.5	4	2.8
	1–3 times	30	22.9	35	24.3
	4–10 times	37	28.2	44	30.6
	10–20 times	35	26.7	33	22.9
	More than 20 times	27	20.6	28	19.4
Degree of online travel review usage	Not at all	3	2.3	3	2.1
	Occasionally	10	7.6	12	8.3
	Normal	27	20.6	40	27.8
	Often	68	51.9	57	39.6
	Very often	23	17.6	28	19.4
Total		131	100	144	100

Note. US\$1 = 1183 Korean won according to Korea Exchange Bank in August 19, 2015

**Table 2** Exploratory factor analysis results of near- and far future tourists

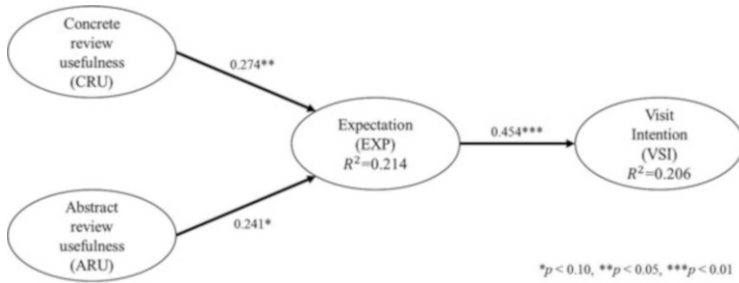
1 Constructs and variables	2 Standardized factor loadings (near/far)			
<b>Expectation (EXP)</b>				
1. I expect I will experience the destination the as same as the online review introduces.	<b>0.886/0.906</b>	0.313/0.396	0.356/0.402	0.295/0.325
2. I expect that the travel will be satisfyingied.	<b>0.909/0.925</b>	0.355/0.447	0.368/0.367	0.483/0.483
3. I expect that the travel will be pleasinged.	<b>0.924/0.934</b>	0.432/0.469	0.418/0.435	0.430/0.462
<b>Abstract review usefulness (ARU)</b>				
1. This review improves my ability to make a decision on whether or not to visit the destination.	0.276/0.463	<b>0.875/0.896</b>	0.523/0.575	0.309/0.485
2. This review gives me insight into whether or not I would like to visit the destination.	0.300/0.385	<b>0.935/0.907</b>	0.547/0.579	0.313/0.467
3. This review contains useful information about the destination.	0.329/0.448	<b>0.853/0.908</b>	0.494/0.592	0.289/0.439
4. How helpful was this review?	0.291/0.435	<b>0.950/0.934</b>	0.564/0.577	0.358/0.442
<b>Concrete review usefulness (CRU)</b>				
1. This review improves my ability to make a decision on whether or not to visit the destination.	0.403/0.389	0.529/0.597	<b>0.924/0.916</b>	0.367/0.416
2. This review gives me insight into whether or not I would like to visit the destination.	0.428/0.421	0.565/0.565	<b>0.934/0.904</b>	0.367/0.430
3. This review contains useful information about the destination.	0.292/0.359	0.487/0.568	<b>0.845/0.887</b>	0.526/0.473
4. How helpful was this review?	0.324/0.413	0.546/0.592	<b>0.916/0.934</b>	0.520/0.509
<b>Visit intention (VSI)</b>				
1. I am likely to visit the destination introduced in the online review.	0.408/0.430	0.334/0.508	0.474/0.485	<b>0.953/0.942</b>
2. Given the opportunity, I intend to visit the destination in the online review.	0.418/0.400	0.348/0.444	0.489/0.481	<b>0.950/0.944</b>
3. It is likely that I will actually visit the destination in the online review.	0.420/0.477	0.312/0.467	0.386/0.452	<b>0.929/0.936</b>

with the eigenvalues higher than one in both groups; thus, the absence of common method bias is proved. The standardized factor loadings of each item are measured over 0.7, which is the threshold of loadings to be empirically significant (Nunnally, Bernstein, & Berge, 1967); hence, it is confirmed that one of the requirements is met for verifying the convergent validity of the measurements.

To identify the other conditions for the measurements' convergent validity, the composite reliability (CR), Cronbach's  $\alpha$ , and average variance extracted (AVE) of each construct are checked (Bagozzi & Yi, 1988). The CR, Cronbach's  $\alpha$ , and AVE of each construct exceed 0.7 in both data sets; thus, the convergent validity of measurements is supported. Regarding the discriminant validity, the construct's

**Table 3** Constructs' correlations of near- and far future tourists (near/far)

	CR	Cronbach's $\alpha$	AVE	EXP	CRU	ARU	VSI
EXP	0.919/0.944	0.870/0.912	0.791/0.850	1.000/1.000			
CRU	0.947/0.951	0.925/0.932	0.817/0.830	0.333/0.477	1.000/1.000		
ARU	0.948/0.951	0.927/0.932	0.820/0.826	0.407/0.435	0.589/0.637	1.000/1.000	
VSI	0.961/0.959	0.939/0.935	0.891/0.885	0.440/0.466	0.351/0.503	0.477/0.502	1.000/1.000



**Fig. 2** Hypotheses test results: Overall model

loading on the construct of interest should be higher than the loadings on any other constructs, and the AVE's square root must be larger than each correlation coefficient (Bhattacharjee & Sanford, 2006). As indicated in Table 3, the two requirements for the discriminant validity are met in both groups.

**Structural Model and Hypotheses Test** In total, three different models are analyzed in this study. All of the models are estimated based on a bootstrapping technique, and the sample size is 500. For the overall group, all of the hypotheses appeared empirically significant. The expectation is influenced positively by the concrete review usefulness ( $\beta = 0.274$ ,  $t$  value = 2.063,  $p < 0.05$ ) and abstract review usefulness ( $\beta = 0.241$ ,  $t$  value = 1.838,  $p < 0.1$ ). The expectation regarding the destination has a positive impact on the intention to visit the destination ( $\beta = 0.454$ ,  $t$  value = 4.147,  $p < 0.01$ ). Therefore, H1, H2, and H3 are supported (Figs. 2 and 3).

For the near future tourist group, the positive influence of concrete review usefulness ( $\beta = 0.323$ ,  $t$  value = 2.557,  $p < 0.05$ ) and expectation ( $\beta = 0.440$ ,  $t$  value = 4.146,  $p < 0.01$ ) is significantly confirmed except for the abstract review usefulness's influence on expectation ( $\beta = 0.143$ ,  $t$  value = 1.107). The tourists who will travel in the near future tend to perceive concrete reviews as more useful; hence, the tourists' expectation is influenced by concrete reviews rather than by abstract reviews. Based on the results, H4 is supported. However, in the far future tourist group, the positive effect of abstract review usefulness ( $\beta = 0.337$ ,  $t$  value = 2.533,  $p < 0.05$ ) and expectation ( $\beta = 0.466$ ,  $t$  value = 4.515,  $p < 0.01$ ) are proved to be significant except for the concrete review usefulness's impact ( $\beta = 0.221$ ,  $t$  value = 1.720). The travelers who will travel in the distant future are likely to perceive abstract reviews as more useful; therefore, the expectation

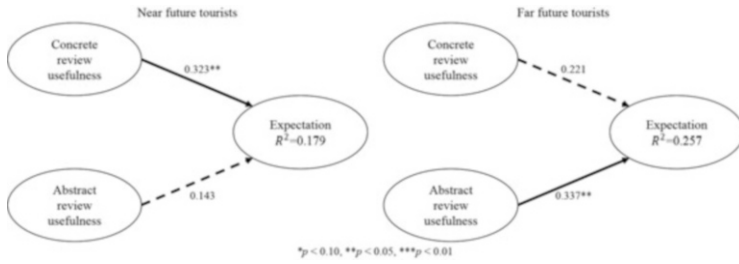


Fig. 3 Hypotheses test results: Comparing near and far future tourists

regarding the destination is easily affected by the subjective abstract reviews rather than the objective concrete reviews. Consequently, these results supported H5.

## 6 Discussion and Conclusion

**Key Findings** This study verifies the relation between the review usefulness of different types of online travel reviews and temporal distance. By adopting CLT, several hypotheses are suggested and investigated using separate samples. Because the influences of review usefulness of two different online travel reviews vary significantly depending on the temporal distance, the results of this research support CLT in the online travel review context. Consequently, the results are consistent with the arguments of CLT. Interestingly, the abstract review usefulness has a very low impact on expectation in the overall group. According to the concept of information accessibility, conceptualized as a degree of how easily the information can be searched from memory to make a decision (Li et al., 2011), concrete information is more diagnostic than abstract information because the former is easier to store in the memory due to clear objective boundaries for processing information (Wyer & Srull, 2014). Thus, concrete reviews can be generally perceived as more useful than abstract reviews.

**Theoretical Implications** To our knowledge, this study is the first research to examine the influence of review usefulness on the information receiver’s perception and behavioral intention. The major topics of the research streams are the exploration of online reviews’ impact on the consumers’ reactions or investigation of review usefulness. Therefore, this study contributes to the online review research field by suggesting an emerging study topic, which is a relation between review usefulness and consumer perception. Moreover, this research proves the temporal distance in the online travel review context. Although several studies investigate the psychological distance in tourism perspectives, the spatial dimension is solely researched.

**Practical Implications** The research results provide certain implications to destination marketers and travel agencies. Destination marketers can create more

appealing information for their potential customers by providing different types of information. This study re-confirms the effect of psychological distance on the tourist's information perception by proving a temporal dimension; thus, the foundation for differentiated information marketing depending on the customer's spatial distance or temporal distance is secured. By creating abstract information for customers who plan to travel to distant destinations in the far future or concrete information for customers who plan to travel to close destinations in the near future, marketers are able to efficiently increase the customer's expectation. These intensified grounds enable travel review websites to obtain possibilities of differentiated interface strategies based on the users' situation solely if the website can know the user's information regarding his or her travel plans. Additionally, travel agencies can provide differentiated service to the customers longitudinally. For example, travel agencies can excite customers by showing the destination's abstract traits, such as the beautiful scenery, delicious food, and desirable attraction when there is a long period prior to travel; conversely, if there is a short time before the travel, the customers can affect their tour through concrete information, such as the weather, ticket price, and exact location of hotels.

**Limitations and Future Research** Few limitations can be found in this study, and certain propositions for future research are able to be suggested. First, this study conducts a survey of tourists from South Korea who plan to visit Guam. The results of a single case study have concerns regarding external validity and generalization. In future research, the sample needs to be expanded to ensure the result's validity and increase the generalization possibility. Second, this study uses different data sets from different samples. Thus, the research results can be influenced by the difference in samples. Therefore, if future studies collect the data from a single sample based on a longitudinal designed survey, more reasonable results will be found.

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## References

- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74–94.
- Berger, C. R., & Calabrese, R. J. (1975). Some explorations in initial interaction and beyond: Toward a developmental theory of interpersonal communication. *Human Communication Research*, 1(2), 99–112.
- Bhattacharjee, A., & Sanford, C. (2006). Influence processes for information technology acceptance: An elaboration likelihood model. *MIS Quarterly*, 30, 805–825.
- Bickart, B., & Schindler, R. M. (2001). Internet forums as influential sources of consumer information. *Journal of Interactive Marketing*, 15(3), 31–40.
- Buhalis, D., & Licata, M. C. (2002). The future eTourism intermediaries. *Tourism Management*, 23(3), 207–220.

- Chen, Y., & Xie, J. (2008). Online consumer review: Word-of-mouth as a new element of marketing communication mix. *Management Science*, 54(3), 477–491.
- Dhar, R., & Kim, E. Y. (2007). Seeing the forest or the trees: Implications of construal level theory for consumer choice. *Journal of Consumer Psychology*, 17(2), 96–100.
- Gefen, D. (2000). E-commerce: The role of familiarity and trust. *Omega*, 28(6), 725–737.
- Gretzel, U., & Yoo, K. H. (2008). Use and impact of online travel reviews. *Information and communication technologies in tourism, 2008*, 35–46.
- Herr, P. M., Kardes, F. R., & Kim, J. (1991). Effects of word-of-mouth and product-attribute information on persuasion: An accessibility-diagnostics perspective. *Journal of Consumer Research*, 17, 454–462.
- Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, 20(2), 195–204.
- Jiang, Z., & Benbasat, I. (2007). Research note—investigating the influence of the functional mechanisms of online product presentations. *Information Systems Research*, 18(4), 454–470.
- Kellermann, K., & Reynolds, R. (1990). When ignorance is bliss the role of motivation to reduce uncertainty in uncertainty reduction theory. *Human Communication Research*, 17(1), 5–75.
- Kim, M., Chung, N., Lee, C., & Kim, J. (2012). Do loyalty groups differ in the role of trust in online tourism shopping? A process perspective. *Journal of Travel & Tourism Marketing*, 29(4), 352–368.
- Lee, K. Y., & Kim, S. W. (2012). The impact of online reviews in purchasing decision making—controlling effects of Positive/Negative reviews. *Customer Satisfaction Management Research*, 14(3), 85–102.
- Li, M., Huang, L., Tan, C., & Wei, K. (2011). Assessing the helpfulness of online product review: A progressive experimental approach. In P. Seddon & S. Gregor (Eds.), *Pacis* (p. 111). Australia: Queensland University of Technology.
- Lieberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology*, 75(1), 5.
- Litvin, S. W., Goldsmith, R. E., & Pan, B. (2008). Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*, 29(3), 458–468.
- Liu, Z., & Park, S. (2015). What makes a useful online review? Implication for travel product websites. *Tourism Management*, 47, 140–151.
- Mauri, A. G., & Minazzi, R. (2013). Web reviews influence on expectations and purchasing intentions of hotel potential customers. *International Journal of Hospitality Management*, 34, 99–107.
- Moore, D. J., & Harris, W. D. (1996). Affect intensity and the consumer's attitude toward high impact emotional advertising appeals. *Journal of Advertising*, 25(2), 37–50.
- Mudambi, S. M., & Schuff, D. (2010). What makes a helpful review? A study of customer reviews on Amazon.com. *MIS quarterly*, 34(1), 185–200.
- Nunnally, J. C., Bernstein, I. H., & Berge, J. M. T. (1967). *Psychometric theory*. New York: McGraw-Hill.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879.
- Prothero, J., & Beach, L. R. (1984). Retirement decisions: Expectation, intention, and action. *Journal of Applied Social Psychology*, 14(2), 162–174.
- Racherla, P., & Friske, W. (2012). Perceived 'usefulness' of online consumer reviews: An exploratory investigation across three services categories. *Electronic Commerce Research and Applications*, 11(6), 548–559.
- Trope, Y., Liberman, N., & Wakslak, C. (2007). Construal levels and psychological distance: Effects on representation, prediction, evaluation, and behavior. *Journal of Consumer Psychology: The Official Journal of the Society for Consumer Psychology*, 17(2), 83–95.

- Tussyadiah, I. P., & Fesenmaier, D. R. (2009). Mediating tourist experiences: Access to places via shared videos. *Annals of Tourism Research, 36*(1), 24–40.
- Vermeulen, I. E., & Seegers, D. (2009). Tried and tested: The impact of online hotel reviews on consumer consideration. *Tourism Management, 30*(1), 123–127.
- Walmsley, D., & Jenkins, J. M. (1992). Tourism cognitive mapping of unfamiliar environments. *Annals of Tourism Research, 19*(2), 268–286.
- Wang, Y., Yu, Q., & Fesenmaier, D. R. (2002). Defining the virtual tourist community: Implications for tourism marketing. *Tourism Management, 23*(4), 407–417.
- Wyer, R. S., Jr., & Srull, T. K. (2014). *Memory and cognition in its social context*. New York: Psychology Press.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management, 31*(2), 179–188.
- Ye, Q., Law, R., & Gu, B. (2009). The impact of online user reviews on hotel room sales. *International Journal of Hospitality Management, 28*(1), 180–182.
- Young, M. (1999). Cognitive maps of nature-based tourists. *Annals of Tourism Research, 26*(4), 817–839.
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1993). The nature and determinants of customer expectations of service. *Journal of the Academy of Marketing Science, 21*(1), 1–12.



# Online Hotel Reviews: Rating Symbols or Text. . . Text or Rating Symbols? That Is the Question!

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Miriam Hauschild, Martina Zöhrer, and Roman Egger

**Abstract** This paper deals with the question of how hotel reviews impact the decision-making process of choosing hotel accommodation and the role which rating symbols play on hotel review and electronic booking intermediary websites. A potential customer's decision in favour of or against a particular hotel may be influenced by the ratio of positive and negative reviews on hotel review platforms. Another crucial aspect is the importance placed on rating symbols in comparison to textual material. Therefore, the aim of this paper is to identify whether the first look at a hotel review is directed towards rating symbols or text. This research was conducted by means of a true experiment that made use of eye-tracking technology (BeGaze 3.4). The findings show that high priority is given to rating symbols rather than textual material and that the ratio of positive and negative reviews only partially influences an individual's decision for or against a certain accommodation. Furthermore, it offers tourism managers a deeper understanding of the importance of online hotel reviews.

**Keywords** Eye-tracking technology • Rating symbols • Positive and negative (online) hotel reviews • Decision-making process

## 1 Introduction

Competition in the tourism industry has gotten more intense nowadays due to globalization and the rise of Web 2.0. The Internet plays a major role these days in that it makes tourism-related decision-making processes more complicated (Soo, Vogt, & Mackay, 2007). Nearly every aspect of people's day-to-day lives has been altered, ranging from modes and habits of communication, attitudes related to learning, working and playing, to the ways in which consumer products and services are purchased (Lee & Tussyadiah, 2011). Browning, So, and Sparks

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(2013) highlight the fact that tourism products are intangible and produced and consumed coincidentally and are therefore not easy to rate prior to their actual consumption. The major role played by electronic word-of-mouth in the tourism industry these days is a prevalent fact. While traditional face-to-face word of mouth can only disseminate messages orally in a limited scope, electronic word-of-mouth has the great advantage “of potentially conveying both verbal and visual information simultaneously; this advantage makes its impact even more powerful” (Lee & Tussyadiah, 2011, p. 351). Browning et al. (2013) emphasise the high importance Internet users place on recommendations from friends and other travellers on review platforms, being more inclined to trust these rather than advertising and marketing campaigns. Symbols in this regard seem to be a standard feature of hotel review platforms. The online Oxford dictionary defines symbols as: “A mark or character used as a conventional representation of an object, function, or process” (oxforddictionaries.com). According to this definition, stars, overall ratings and pictures are considered as rating symbols in the context of this research. An extensive amount of literature exists on hotel reviews, including electronic word-of-mouth and positive and negative reviews. However, limited research has been conducted so far with regard to the importance of rating symbols in hotel reviews and consequently, the authors hope that by addressing this gap, this paper will be a vital contribution to the existing literature. Related to this, the following questions arise: How do hotel reviews impact the decision-making process of choosing hotel accommodation and which role do rating symbols play on hotel review and electronic booking intermediary websites? Do potential travellers first look at the actual hotel review, which is the written text, or do they tend to look at the rating symbols first and foremost? Is there a correlation between the ratio of positive and negative reviews and the potential travellers’ perception of the product? The purpose of this paper is to address these questions. One major finding from the empirical study is that rating symbols are regarded as more significant than the written hotel review. The findings are relevant for tourism managers since they indicate that potential guests mainly look at the rating symbols of a hotel review and not at the actual written text. This means that a single negative review will not have a huge impact as the customers are primarily looking at the overall rating of a property. These research findings are based on a true experiment, which utilised eye-tracking technology, an approach that has not been adopted by mainstream tourism-related research to date.

## 2 Literature Review

Since the mid-twentieth century tourism has been developing parallel to technological progress and is currently credited as one of the biggest economies globally, and given how necessary social systems of communication are for the tourism industry, it is no wonder that technological advancements such as Web 2.0 have had a remarkable impact on the tourism industry (Egger, 2010). Sigala (2007a) explains

that Web 2.0 encompasses a variety of internet tools, which enable collaboration among users so that they can generate, use and diffuse information through the Internet. In this context most people consider reviews as an important tool for deciding where to stay at a particular destination. However, Gretzel, Yoo, and Purifoy (2007) believe that incentives are needed so as to encourage consumers to use online hotel reviews in all stages of their travel decision-making process, not only before but also during the trip and after returning. "In the travel industry, online reviews (ORs) can be considered as electronic versions of traditional WOM [word-of-mouth] and consist of comments published by travellers on the tourism products, services, and brands they experience" (Fileri & McLeay, 2014, p. 44). Rasty, Chou, and Feiz (2013) argue that the more a person is involved in the information search (which in this case is very often done through online hotel reviews), the more impact it will have on the decision-making. The available information is a key determinant in the decision-making process that seems to be highly affected by hotel reviews. A survey conducted by an accommodation facility owned by Tui, known as Late Rooms.com, highlights the increasing demand for online reviews and the survey shows that among the 1.366 participants 40 % searched the Internet with the intent to look at reviews written by former guests (Davies, 2012). Further, Barreda and Bilgihan (2013) state that through analysing the content of consumers' comments, managers gain a deep understanding of customers' feelings about their experiences at a hotel. Online hotel reviews are not only crucial for other potential customers of a hotel as a credible source of information but also for owners and managers of a hotel themselves. Through these reviews they get a sense of what people think about an accommodation and what may need improvement so as to increase customer satisfaction. This means that online hotel reviews are important for participants on both sides of the chain. They not only provide easy accessible information and a fast, private and anonymous way of communication but above all, up-to-date and credible data for consumers and hotel owners and managers likewise. The customers' judgement of the quality of purchased and experienced products and services, is based on whether their expectations have been met or not (Browning et al., 2013). When considering the importance of online hotel reviews, it is also essential to deal with the question of whether those people writing reviews are actually producing helpful information for their peers or not. In their study about helpful reviewers on TripAdvisor, Lee, Law, and Murphy (2011) state that reviewers are considered as helpful when they are frequent travellers and are actively participating in posting reviews; those reviewers belonging to no particular age and gender group and are rather giving lower hotel ratings. Not only do potential customers care about aspects like price, brand and the country of origin that allude to the quality of a product, but reputation is another crucial issue, most of all when it comes to the question of how reputable a communicator of online information is (Lee et al., 2011). The issue of trust and credibility of information on social media sites, on hotel reviews platforms in particular, and its effect on the decision-making process is one that has caused a divide among scholars. Gretzel et al. (2007), Fotis, Buhalis, and Rossides (2012), and Barreda and Bilgihan (2013) contend that users find information generated by

others trustworthy. On the contrary, Cox, Burgess, Sellitto, and Buultjens (2009) argue that social media reviews have a limited influence on the final decision of users, owing to the issue of trustworthiness and credibility of information, as some of the posts can be faked by service providers. Additionally, Ayeh, Au, and Law (2012) also highlight the possibility of questionable credibility of hotel reviews, as some might not be authentic due to managers who masquerade as guests on hotel review platforms. In general, positive messages can be helpful, but they alone are not the decisive factor. According to Doh and Hwang (2009), a few negative messages among several positive ones are not considered as harmful. With regard to traditional word-of-mouth, one affirms that negative reviews have a greater impact on readers than positive ones and negative reviews should not be kept aside when dealing with online hotel reviews as they indeed have a great impact on consumers. Overall, a good review is defined as being rational, rich in descriptions, detailed, balanced and critical, and listing both pros and cons of the product in question (Clare, 2010). In fact, negative reviews do not necessarily need to have a negative impact on customers as a certain negative aspect may not be relevant to every individual and thus, may not have any significance at all (*ibid*). So it is the goal of this study to not only examine how hotel reviews influence the decision-making process of potential customers and to analyse the importance of rating symbols but to find out about the impact of negative reviews as well.

### 3 Research Methodology

In choosing a methodology suitable for this particular study about online hotel reviews, which among others aims at examining symbols and their values when it comes to the customers' decision-making process, the researchers decided to use a method that has not gained widespread popularity so far in the field of tourism: the method of eye-tracking. Predominantly employed in studies connected to marketing, psychological or most often medical issues, this method is "used to measure a person's point of gaze, which focuses on what a person [is] looking at and [on] find [ing] out the eye spot" (Ramakrisnan, Jaafar, Razak, & Ramba, 2012, p. 529). The researcher records the participants' eye movements while they are performing a given task in order to be provided with information about the cognitive process that occurs when completing the task as explained by Ramakrisnan et al. (2012). The individuals' eye-movements along a chosen webpage provide information about focus areas of attention, areas or elements that are disregarded and elements which seem to disturb the participants (Tonbuloglu, 2013). Characteristically of qualitative data collection, the sampling of the participants for the study in question took part per random selection and it was not aimed at being representative as would be the case in quantitative research. So the issue of demographics was not taken into consideration but the participants were asked to take part in this study via an e-mail that was sent to about 100 students of the Salzburg University of Applied Sciences and were then randomly chosen. Nielsen and Pernice (2010, p. 22) state that a

“basic qualitative usability study requires only five people to find many of the usability issues with a system.” Sticking to these findings, this research was conducted with eight subjects per group so as to determine how people proceed when reading through hotel reviews. The study then took place during one day in spring at Salzburg University of Applied Sciences. By means of a true experiment the ratio of positive and negative reviews in relation to participants’ decision for or against the hotel was analysed. According to Bryman (2012, p. 59): “[...] in order to conduct a true experiment, it is necessary to manipulate the independent variable in order to determine whether it does in fact have an influence on the dependent variable.” A true experiment according to this definition rarely exists in the field of social sciences, but in this case it worked out well as it was possible to manipulate the independent variable (Bryman, 2012). In order to abide by the definition of a true experiment, the independent variable (the ratio of positive and negative reviews) had to be manipulated, while the dependent one (the participants’ decision for or against the hotel) stayed the same. To briefly describe the procedure of eye-tracking, the first step is the calibration process, which requires the eye-tracking device to be properly adjusted to fit the actual participant. Then the participant is asked to start with the realisation of the given task, and then the researchers accumulate precise data and information about the participant’s performance in a visual and recorded form. The visual information includes a gaze plot, providing material on fixations (those moments when the eyes remain fairly static) and saccades (movements between one fixation to another) as well as a heat map, illustrating the participant’s focus areas of attention by means of colours (Ramakrisnan et al., 2012). In this particular project, BeGaze 3.4 was used, which works exactly as outlined above. For the analysis of the data gained through the eye-tracking device, the researchers chose to stick to heat maps as well as to the first and last fixations of the individual participants, ways of analysis that will be discussed in the following chapters.

As a starting point for this research, a pre-study was conducted about suitable hotel reviews. It was decided beforehand to only consider Austrian four-star hotels as well as to choose a hotel located in the city, Holiday Inn Salzburg City, and to include a country hotel, Latini Hotel in Zell am See, both of which were randomly chosen. This was done to avoid any kind of bias that people might have due to certain preferences for location and types of hotel. Moreover, the researchers aimed at having a more holistic and comprehensive approach with regard to the research questions. A list of various hotel reviews, randomly taken from the hotel review platform TripAdvisor, was compiled. This collection was handed out to 20 randomly selected participants who were asked to read it and to mark whether they considered the individual hotel reviews as positive, negative or neutral. Thus, this first step of research served as a guideline to indicate which reviews people consider as positive and which as negative. The layout of TripAdvisor was then used as a basis for the prototype for the actual eye-tracking experiment, as it is a commonly known hotel review platform. As a matter of fact, two prototypes were designed, first showing hotel reviews of Holiday Inn Salzburg City and after that, reviews of Latini Hotel. One contained more positive than negative reviews and the second

one consisted of more negative than positive reviews. This was done in order to manipulate the independent variable (the ratio of positive and negative reviews). Due to the nature of the eye-tracking software (BeGaze 3.4), which only allows for pictures to be inserted, screenshots of the prototype were taken and inserted into the software to be able to put together the tasks for the participants. Finally, both prototypes comprised of four pictures, two of Holiday Inn Salzburg City and two of Latini Hotel. This means that participants did not have the feeling of viewing a conventional webpage, where one can scroll up and down. In the end, there were two tasks, or one could say two groups, one which was called “positive” and one called “negative”, according to the number of negative and positive reviews they included. Both tasks were compiled in the same way, including the same layout and the same hotel reviews as much as possible. Thus, some hotel reviews were used in both prototypes—naturally, in the positive prototype there were more positive ones and in the negative more negative ones. So it was only the ratio and the sequence of positive and negative reviews that had been changed.

The 16 participants were chosen per random selection and their task was to read the hotel reviews of both Holiday Inn Salzburg City and Latini Hotel. While performing the tasks, the participants were not limited by time and were able to freely decide how much time they wanted to spend looking at the individual pictures of the prototype. Afterwards, they were asked to answer questions from a structured questionnaire posed by the researchers. However, the participants were not aware of the questions while performing the tasks. The questionnaire served as a backup-method to find out whether the participants would book a holiday in the hotels in questions or not. Furthermore, the researchers wanted to determine why and how the participants came to their decision. The following questions were asked: (1) Which item first caught your attention? (2) Did you first look at the text or the rating symbols (stars)? (3) Why? (4) Would you choose to stay overnight in the hotels you just looked at, as part of your holiday? (5) Was your decision for or against the hotels influenced by the comments/hotel reviews? Why? (6) Any other comments? Regarding the development of the questionnaire, the questions asked were developed according to the conducted research and were simply used as a support of the chosen method of eye-tracking.

For a better understanding Table 1 displays the Areas of Interest (AOIs) the researchers identified as central to conducting the eye-tracking procedure and succeeding analysis.

## 4 Findings

By means of the defined AOIs shown in Table 1, the researchers could precisely analyse the participants’ first and last fixations on each page of the given task. Table 2 shows the individual participants’ first and last fixations on the first page of the positive testing. To better visualise these findings, also two videos have been converted and uploaded on one of the researcher’s YouTube channel. These videos

**Table 1** List of AOIs

Positive testing				Negative testing			
Hotel	Pg.	AOI	AOI-Name	Hotel	Pg.	AOI	AOI-Name
<b>Holiday Inn</b>	1	1-001	Big Title, Name & Address	<b>Holiday Inn</b>	1	1-001a	Big Title, Name & Address
		1-002	Big Picture			1-002a	Big Picture
		1-003	Small Pictures			1-003a	Small Pictures
		1-004	Percentage			1-004a	Percentage
		1-005	Overall Review			1-005a	Overall Review
		1-006	First Positive Headline & Stars			1-006a	First Headline & Stars
		1-009	Negative Headlines			1-009a	Negative Headlines
		1-010	Text block			1-010a	Text block

will give the reader a better insight into the actual way of analysing eye-tracking data by using scan paths:

- Video 1: Scan path example 1 (negative task): <https://www.youtube.com/watch?v=F0gPJ4vKE0g&feature=youtu.be>.
- Video 2: Scan path example 2 (positive task): [https://www.youtube.com/watch?v=uVI2iTupS\\_o&feature=youtu.be](https://www.youtube.com/watch?v=uVI2iTupS_o&feature=youtu.be).

Concerning the analysis of the eye-tracking data, the researchers’ focus was where the first gaze of the individual participants was directed towards on each page of the given tasks. The findings clearly indicate that participants frequently choose rating symbols as the first item to look at. To be more concrete, when it comes to the first page of the positive task (Holiday Inn Salzburg City), four participants took their first look at AIO 1-006 (First Positive Headline & Stars); two of them preferred AIO 1-002 (Big Picture), one participant first focused on AIO 1-001 (Big Title, Name & Address) and one first dealt with AIO 1-004 (Percentage). On the second page of the positive testing (Holiday Inn Salzburg City), three participants started with looking at AIO 2-002 (Target Groups), two first looked at AIO 2-001 (Scoring) and one participant took his first glance at AIO 2-003 (Overall Rating), AIO 2-004 (Headline & Stars—Negative) and AIO 2-006 (Positive Reviews). Going on with the positive task, on the third page covering reviews of Latini Hotel, five participants first went for AIO 3-001 (Big Title, Stars & Address), two for AIO 3-002 (Big Picture) and one participant first had a look at AIO 3-004 (Percentage). On the fourth and last page of the positive task (Latini Hotel) the majority (five participants) went for AIO 4-001 (Scoring) and three for AIO 4-002 (Target Groups). With regard to the negative testing, the analysis of the

**Table 2** First and last fixations

Positive testing				
Name	Page	First look	Last look	Time (s)
Sebastian	Holiday Inn 1st page	AOI 1-002 Big Picture	AOI 1-002 Big Picture	16.7
Manuel	Holiday Inn 1st page	AOI 1-006 First Positive Headline & Stars	AOI 1-005 Overall Review	16.6
Peter	Holiday Inn 1st page	AOI 1-006 First Positive Headline & Stars	AOI 1-001 Big Title, Name & Address	13.3
Mark	Holiday Inn 1st page	AOI 1-001 Big Title, Name & Address	AOI 1-001 Small Pictures	57.7
Michal	Holiday Inn 1st page	AOI 1-006 First Positive Headline & Stars	AOI 1-010 Text block	34.5
Axel	Holiday Inn 1st page	AOI 1-004 Percentage	AOI 1-005 Overall Review	19.2
Pia	Holiday Inn 1st page	AOI 1-006 First Positive Headline & Stars	AOI 1-007 Text One	16.3
Lasse	Holiday Inn page	AOI 1-002 Big Picture	AOI 1-002 Big Picture	12
Results		AOI 1-002 Big Picture—2 participants	AOI 1-001 Big Title, Name & Address—1 participant	Average 23.2
		AOI 1-006 First Positive Headline & Stars—4 participants	AOI 1-002 Big Picture—2 participants	
		AOI 1-001 Big Title, Name & Address—1 Participant	AOI 1-003 Small Pictures—1 participant	
		AOI 1-004 Percentage—1 participant	AOI 1-005 Overall Review—2 participants	
			AOI 1-007 Text One—1 participant	
			AOI 1-010 Text block -1 participant	

participants' first fixations shows quite the same pattern as with the positive testing. Again, on the first page of the negative task (Holiday Inn Salzburg City) the majority (three participants) had a first look at AOI 1-006a (First Headline & Stars). On the second page of this task (Holiday Inn Salzburg City), six participants went for AOI 2-001a (Scoring) and two for AOI 2-002a (Target Groups), which is quite similar to the results of the second page of the positive testing. Going on with the third and fourth page of the negative task (Latini Hotel), the majority here first



looked at AOI 3-001a (Big Title, Stars & Address) on page three (four participants) and at AOI 4-001a (Scoring) on page four (six participants), which is again on par with the positive task. When one looks at these tasks as a whole in the context of the participants' first fixations, 13 of the participants first looked at rating symbols on those pages covering reviews of Holiday Inn Salzburg City. The same situation applied for even 15 participants when it comes to the rest of the pages, including reviews of Latini Hotel. Whereas the first fixations of the participants show a clear pattern and mainly involve rating symbols like stars and scoring, the last fixations do not show such a straightforward line but are quite mixed. In both testing procedures, positive and negative, the last fixations of the majority range from AOI 1-005 (Overall Review) with two participants on page one, AOI 2-004 (Headline & Stars—Negative) with four participants on page two, AOI 3-002 (Big Picture) with three participants on page three and AOI 4-002 (Target Groups) and AOI 4-003 (Overall Rating) with three participants each on page four in the positive task. Regarding the negative task, AOI 1-004a (Percentage) and AOI 1-005a (Overall Review) scored with two participants each on page one, AOI 2-002a (Target Groups) with three participants on page two, AOI 3-004a (Percentage) with three participants on page three and AOI 4-004a (Headline & Stars—Negative) with four participants on page four.

The structured questionnaires that served as back-up method to the eye-tracking procedure, showed results similar to the analysis of the eye-tracking data. Regardless of whether they took part in the positive or the negative testing, the majority of participants stated that the first items that caught their attention were either pictures (12 participants) or the overall rating symbol in the form of a percentage (ten participants). This reinforces the results of the eye-tracking procedure as 14 of the participants stated that they first looked at symbols rather than text items. Citing reasons for this, it was explained that symbols are outstanding, easy to spot and that they give an overview of the product (in this case, the hotels). With regard to the two different tasks, positive and negative, this only partially influenced the participants' final decision for or against the two hotels. Six participants of the positive testing decided in favour of both hotels and the remaining two participants stated that they would only decide on one of the hotels, one for Holiday Inn Salzburg City and the other one for Latini Hotel. As for the negative testing, half of the participants would spend a holiday in both hotels and the other half would not do so in either of them. When it comes to the second last question whether their decision for or against the hotels had been influenced by the hotel reviews (meaning the actual text, either positive or negative) or not, interestingly enough, half of the participants from the positive testing declared yes, and the other half claimed they were not. According to their answers, the hotel reviews (actual text) only partially influenced their decision-making process, but the overall rating symbol (percentage), pictures and personal preferences were also considered as important aspects in this regard. Six of the participants from the negative testing on the other hand clearly stated "no", illustrating that the actual text did not influence them at all but it was the overall rating symbol (percentage) that had the strongest impact on their decision-making. In order to analyse the eye-tracking data, heat maps were used to visualise

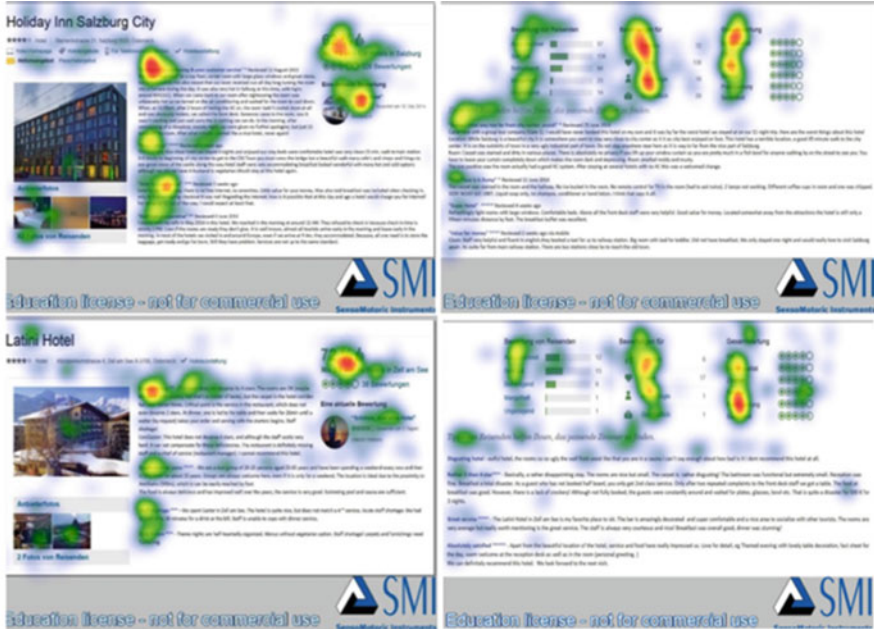


Fig. 1 Heat maps negative task

the findings. Heat maps utilise a particular colour spectrum to reveal the intensity of fixations of all 16 participants. Compared to scan paths, they provide a clearer level of visual overview (Lorigo et al., 2008). The colours red, orange, yellow and green refer to the number of fixations in descending order. All findings listed in the previous paragraph were consistent with the heat maps, and contributed immensely to answering the research questions. As illustrated in Fig. 1, the heat maps show fixations on the overall rating symbols as well as on the headlines. This is coherent with the findings that participants hardly looked at the text but rating symbols were much more appealing.

Figure 1 only displays a few fixations. A large number of fixations is considered an indicator of poor arrangements of objects in a stimulus (Yusuf, Kagedi, & Maletic, 2008), thus, the objects in this particular setting were clearly arranged. In general, symbols are of utmost importance and this theory has been corroborated given the outcome of the participants' interviews. When asked why they looked at the symbols, the most common answers were first of all, due to convenience, and secondly, having the possibility of gaining a quick overview. It is therefore safe to assume that the participants consciously made the choice to first look at the symbols, as they seem to trust them and regard them as an important parameter when making a decision that revolves around booking. The text items on the other hand, were sometimes completely bypassed and overlooked. This could partly be due to their length. Participants claimed that the text was not properly arranged and that it was hard to read, so they decided to skip it and to fully rely on the symbols.

Furthermore, the headlines of the text reviews proved to be much more important than initially thought. Participants clearly did have a look at the headlines as indicated by the heat maps. Generally speaking, the heat maps featuring the positive reviews and the ones featuring the negative reviews show similar patterns. Headlines and rating symbols were equally intensely looked at, whereas the text items did not attract the participants' interest. The pictures of the hotels merely played a secondary role and they were not a decisive factor for the participants' final decision for or against a certain hotel. At best, the pictures could be considered a supporting element. Regarding the first research question, the findings of the backup questionnaire show that half of the participants declared that online hotel reviews indeed influence their decision for or against a hotel, but on the other hand, the other half of them stated that reviews do not impact their decision-making.

The findings of this research further illustrate that comments, meaning the text itself, only partially affect the final decision for or against an accommodation. Again, the analysis of the questionnaire proved that overall rating symbols, pictures and personal preferences also had a strong influence on the participants' final decision, irrespective of positive or negative reviews. The second research question refers to whether potential travellers first look at the actual hotel review, which means the written text, or at the rating symbol. As the findings present, this can be clearly answered as rating symbols (stars & scoring) have a greater significance than text items, gauging by the focus and placement of the first gaze, regardless of whether the participants took part in the positive or the negative group. Coming to the last question whether the ratio of positive and negative reviews influences the potential travellers' perception of the product, the findings show that this was only partially the case. Even though very negative reviews were included in the negative group, participants stated that they would still stay in those hotels in question, taking into consideration the overall rating symbol which was not manipulated.

## 5 Discussion and Implications

Referring to Xiang and Gretzel (2010) and determining that social media offers people a platform to share information as well as tourist experiences, this paper aims at providing hotel managers an insight into the issue of hotel reviews, focusing on negative and positive ratings as well as on rating symbols. There are institutional rating organizations such as the British based AA ratings and Hotrec for countries in the European Union; and there are social review sites like Trip Advisor use a different rating algorithm based on factors such as traveller ratings, guidebook entries and media publications, while disregarding the institutional rating (Felix & Clever, 2014). The big difference is that four-star hotels might not necessarily get higher ratings by travellers on platforms like Trip Advisor. In light of these findings, managers of hospitality sites are given relatively equal opportunities through hotel review sites irrespective of their rating. Giving credit to Barreda and Bilgihan

(2013) again, hotel managers are able to obtain an in-depth and at times, profound impression of their customers' point of view and their experiences on-site when thoroughly analysing their reviews. If management of hospitality sites respond to customers' comments and thus, do their best to meet their needs, they stand high chances of receiving more positive reviews and therefore, may rank higher on review platforms than their competitors. The outcomes of this research with regard to positive and negative reviews correspond with the research of Vermeulen and Seegers (2008), which concludes that positive reviews are determinants of customer behaviour, and is also in line with Clare (2010), asserting that negative reviews have less impact. Vermeulen and Seegers (2008) also reinforce the findings of Doh and Hwang (2009) in declaring that not too much importance should be attached to negative reviews, as long positive and negative views balance each other. Just as Doh and Hwang (2009) reveal, positive reviews alone are not the sole determinant, but some negative reviews are needed as well to perk the interest of travellers and capture their attention. Hotel reviews can never be considered fully objective and are not written without the bias of expectations, previous travel experiences, and personality traits of different individuals. The results of this paper's research show that the decision to book a hotel is based on symbols and ratings rather than the content of reviews. This is consistent with the conclusion of Bing and Lixuan (2009), that people are more drawn to images and symbols rather than to text because images reduce cognitive effort and increase customers' interest in a site. In a more practical context, all those findings suggest that booking platforms should put even more emphasis on the symbols by making them as visible as possible.

## 6 Limitations and Future Research

The findings of this study must be interpreted and analysed cautiously. Due to the qualitative nature of this research, both setting and findings may vary significantly. Firstly, manipulation of the original website was unavoidable. The research setting deviated from a real-life scenario to the extent that participants could not scroll upwards and downwards on their own. Each participant was presented with two pages per hotel, and since scrolling was not possible, the setting was partly perceived as artificial and simulated. Participants had to sit still and their movement radius was significantly limited. Unfortunately, this limitation was related to the intrinsic nature of the software. Moreover, the whole scenario had no effect on the participants because they were not asked to eventually book a vacation package. The hotels were pre-selected by the researchers. As a matter of fact, most participants did not take time to thoroughly examine the hotels, but merely skimmed through each page. Most decisions were made very fast after a first quick overview, and the follow-up interviews showed that these findings corresponded with the results from the eye-tracking analysis. It would be worth exploring if/to what extent external factors such as place and time play an important role as well. With these limitations in mind, future research should seek to integrate the role of the time

component in detail. It was not included because it would have meant going beyond the scope of this study. Furthermore, it would be worthwhile to examine how long particular decisive fixations on a review or a symbol last. Colour and font size of the symbols might also play a crucial role; however, this was not clearly determined by this research. Future studies could also be conducted in a quantitative way, thus paying attention to important factors such as gender, age, education and social status. This would provide an additional opportunity to analyse the importance of hotel online reviews and symbols in a broader and more all-encompassing context.

## References

- Ayeh, K. J., Au, N., & Law, R. (2012). Predicting the intention to use consumer—Generated media for travel planning. *Tourism Management*, *35*, 132–143.
- Barreda, A., & Bilgihan, A. (2013). An analysis of user-generated content for hotel experiences. *Journal of Hospitality and Tourism Technology*, *4*(3), 263–280.
- Bing, P., & Lixuan, Z. (2009). An eye tracking study on online hotel decision making: The Effects of images and number of options. *Travel and Tourism Research Association Conference*.
- Browning, V., So, K. K. F., & Sparks, B. (2013). The influence of online reviews on consumers' attributions of service quality and control for service standards in hotels. *Journal of Travel & Tourism Marketing*, *30*(1–2), 23–40.
- Bryman, A. (2012). *Social research methods* (4th ed.). New York: Oxford University Press.
- Clare, C. (2010). Receiver perspectives of the determinants that influence eWOM adoption: An exploratory study. *Research Institute for Business Management*, (pp. 1–15). Manchester Metropolitan University Business School.
- Cox, C., Burgess, S., Sellitto, C., & Buultjens, J. (2009). The role of user-generated content in tourists' travel planning behaviour. *Journal of Hospitality Marketing and Management*, *18*, 743–764.
- Davies, P. (2012). *Customers 'After the Truth' in Hotel Reviews, Finds Study*. <http://www.travolution.co.uk/articles/2012/11/15/6195/customers-after-the-truth-in-hotel-reviews-finds-study.html>. [Accessed: 26.01.2015].
- Doh, S. J., & Hwang, J. S. (2009). How consumers evaluate eWOM (Electronic Word-of-Mouth) messages. *CyberPsychology & Behaviour*, *12*(2), 193–197.
- Egger, R. (2010). Theorizing Web 2.0 phenomena in tourism: A sociological signpost. *Information Technology and Tourism*, *12*, 125–137.
- Filieri, R., & McLeay, F. (2014). E-WOM and accommodation: An analysis of the factors that influence travellers' adoption of information from online reviews. *Journal of Travel Research*, *53*(1), 44–57.
- Felix, C., & Clever, V. (2014). The relationship between hotel rating and customer outcomes: Customer perceived service quality and customer satisfaction. *Greener Journal of Business and Management Studies*, *4*, 146–156.
- Fotis, J., Buhalis, D., & Rossides, N. (2012). Social media use and impact during the holiday travel planning process. *Information and Communication Technologies in Tourism*. Proceedings of the International Conference in Helsingborg, Sweden, (pp. 1–11).
- Gretzel, U., Yoo, H., & Purifoy, M. (2007). Online travel review study: Role and impact of online travel reviews. *Laboratory for Intelligent Systems in Tourism (by Tripadvisor)*, (pp. 1–70). Texas A&M University.
- Lee, G., & Tussyadiah, I. P. (2011). Textual and visual information in eWOM: A gap between preferences in information search and diffusion. *Information Technology & Tourism*, *12*, 351–361.

- Lee, H. A., Law, R., & Murphy, J. (2011). Helpful reviewers in TripAdvisor, an online travel community. *Journal of Travel & Tourism Marketing*, 28(7), 675–688.
- Lorigo, L., et al. (2008). Eye tracking and online search: Lessons learned and challenges ahead. *Journal of the American Society for Information Science and Technology*, 59(7), 1041–1052.
- Nielsen, J., & Pernice, K. (2010). *Eye tracking Web usability*. Berkeley: New Riders.
- Ramakrisnan, P., Jaafar, A., Razak, F. H. A., & Ramba, D. A. (2012). Evaluation of user interface design for learning management system (LMS): Investigating student's eye tracking pattern and experiences. *Procedia—Social and Behavioural Sciences*, 67, 527–537.
- Rasty, F., Chou, C., & Feiz, D. (2013). The impact of internet travel advertising design, tourists' attitude, and internet travel advertising effect on tourists' purchase intention: The moderating role of involvement. *Journal of Travel & Tourism Marketing*, 30(5), 482–496.
- Sigala, M. (2007a). *Web 2.0 in the tourism industry: A new tourism generation and new E-business models*. [www.traveldailynews.com/pages/print/20554](http://www.traveldailynews.com/pages/print/20554) [Accessed: 26.01.2015].
- Soo, H. J., Vogt, C. A., & Mackay, K. J. (2007). Relationships between travel information search and travel product purchase in pretrip contexts. *Journal of Travel Research*, 45(3), 266–274.
- Tonbuloglu, I. (2013). Using eye tracking method and video record in usability test of educational softwares and gender effects. *Procedia—Social and Behavioural Sciences*, 103, 1288–1294.
- Vermeulen, I. E., & Seegers, D. (2008). Tried and tested: The impact of online hotel reviews on consumer consideration. *Tourism Management*, 30, 123–127.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31, 179–188.
- Yusuf, S., Kagedi, H., & Maletic, J. (2008). *Assessing the comprehension of UML class diagrams via eye tracking*. Kent, OH: Department of Computer Science, Kent State University.

# What Does Hotel Location Mean for the Online Consumer? Text Analytics Using Online Reviews

Zheng Xiang and Matthew Krawczyk

**Abstract** With the continuing growth of online distribution channels how to inspire and support travellers in their online search and purchase process of the hotel product is an ongoing yet challenging task. While its importance to both the management and the consumer has been extensively documented, hotel location has been mostly treated as unidimensional construct within the literature on online travel information search and purchase of hotel product. In this study we mine a large quantity of online reviews associated with a sample of hotel properties in Manhattan, New York City in order to understand how hotel location is perceived by customers. The findings suggest that there are several value-related factors associated with hotel location and hotel properties can be distinguished using these factors. This study gains useful insights into the meaning of hotel location within a tourist destination and offers implications for recommender system development as well as for hotel marketing and promotion.

**Keywords** Location • Online reviews • Text analytics • Online booking • Hotel marketing • Recommender systems

## 1 Introduction

Internet-based channels continue to grow to impact the marketing and distribution of hospitality and tourism products (Xiang, Wang, O’Leary, & Fesenmaier, 2015). For example, online travel agencies (OTAs) and meta search engines experienced a 13.6 % increase in hotel bookings in 2013 compared to the previous year in the North America market (Rudnansky, 2013). This significant shift in product distribution requires a deeper understanding of the online search and purchasing process, particularly how technologies can be used to inspire and support online users. In recent years, there has been a growing literature with the focus on a variety of aspects of the online search and booking process, ranging from system

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functionalities, types of product information as well as presentation of the information (e.g., Ert & Fleischer, 2014; Fesenmaier, Wöber, & Werthner, 2006; Law & Cheung, 2006; Pan, Zhang, & Law, 2013; Ricci, 2002).

Location has been widely documented as one of the key attributes of the hotel product when consumers evaluate available options in the decision making process (e.g., Dolnicar & Otter, 2003; McCleary, Weaver, & Hutchinson, 1993). In online distribution, for example, OTAs and search engines adopt a variety of techniques to communicate location information to online users. To our knowledge, on every OTA or meta search engine website a map function is available to present visual cues to indicate the locations of hotel properties. In addition, websites like Expedia and Travelocity have recently begun to provide location “highlights”, i.e., textual (semantic) cues like “in the city center” and “near a metro station”. Hotels.com lists a number of attributes including “landmark”, “train station”, and “airport”, etc, as “what’s around” in the proximity of the hotel property. Tripadvisor offers ratings as well as aspects such as “quiet” with respect to the hotel’s location. In many cases, location is incorporated as one of the “filters” whereby the user can adjust to narrow down or expand the scope of search results. In opaque systems like Hotwire location is used as the primary parameter to define the consumer’s choice set. While hotel location is obviously an important piece of product information, it appears that there is a lack of consensus among these online channels in terms of what specific values it offers and how the information should be presented to users.

This study aims to gain an understanding of the meaning of hotel location within an online information and transaction context. It is argued that, for a user who is unfamiliar with the place he/she is planning to visit, it is essential for suppliers, either an online agency or a brand website, to provide systematic, meaningful information about what a hotel’s location entails. To do so, we mined hotel customers’ online reviews to identify words consumers used to describe their past experiences, which are associated with different factors related to a hotel’s location. We believe this study is the first step toward developing new insights into product recommendation strategies based upon location information, and it gives hotel managers new perspectives on how to better position their product in order to communicate with the market in more effective ways.

## **2 Research Background**

### ***2.1 Location as a Strategic Resource***

The hotel industry has long considered location as the primary resource for a specific property and, therefore, the literature has focused on location selection from an economic point of view (Yang, Luo, & Law, 2014). As a renowned hotel manager emphasized, the three most important things for a hotel’s success are (1) location, (2) location, and (3) location (Medlik, 1993). An ideal location is



always associated with a larger accommodation demand, higher RevPar, higher guest satisfaction, and lower failure rate. A hotel's location is usually associated with the hotel's accessibility (e.g., distance from the city center and distance from tourist attractions), the characteristics of the site itself, as well as the neighbourhood factors (i.e., the nature of the adjoining land use). As such, location is an important strategic resource that leads to the "localized competition" (Baum & Mezas, 1992) and a deciding factor for hotels to choose their competitive sets (STRanalytics, 2014). Market segment is also strongly related to hotel location (Medlik, 1993). A good location is a clear indication of the value of the hotel product to the consumer, and therefore managers should be able to charge a relatively constant premium room rate over those of competing properties whose other attributes and qualities are similar but which are in an "inferior" location. Therefore, from the hotel's viewpoint the advantageous location of a hotel must be effectively communicated to the market (Lee, Kim, Kim, & Lee, 2010). Promotional material tend to highlight and specify perceived locational advantages as a differential attraction of the property. However, it is not always clear whether consumers themselves perceive the locational benefits in the same way as would hotel managers (Bull, 1994).

## ***2.2 Location as a Decision Making Factor***

From the consumer's standpoint, the location of a property offers a variety of values for staying at the hotel. Hotel location has a profound impact on guest experience because it defines the geographic boundaries as well as business, social and leisure activities that constitute the visitor experience (Shoval, McKercher, Ng, & Birenboim, 2011). In consumer behaviour studies location has been considered one of the most important product attributes along with room, service, staff, facilities, and price etc (e.g., Choi & Chu, 2001; Lewis, 1985; McCleary et al., 1993). While most research on hotel location has concentrated on the distance/access component in consumer product choice, Bull (1994) examined the value of hotel location (i.e., amount willing to pay) and established its relationship with pricing. However, research on consumers' perception of hotel location is fairly limited with the exception of a handful of studies including the Arbel and Pizam (1977) study and, particularly, the Lee et al. (2010) paper which identifies several factors (as well as their relative importance) associated with location including tourism attraction, convenience, safety, surrounding environment, traffic and accessibility.

## ***2.3 Research Motivations***

Given the intangible and complex nature of tourism and hospitality products, there is an ongoing interest in understanding different strategies to support travellers' use of information in the online trip planning process (e.g., Fesenmaier et al., 2006;

Ricci, 2002). With the growing importance of online information search and purchase of hotel product, research has been conducted to understand how system features as well as product-related attributes impact this process. For example, Kim and Kim (2004) identified factors perceived as benefits for using online booking channels as opposed to offline ones. Dickinger and Mazanec (2008) identified hotel product attributes that were considered important for online hotel booking including location, price, hotel review, pictures of room, pictures of hotel, star category, and recommendation of a friend. Ye, Law, Gu, and Chen (2011) examined the influence of electronic word-of-mouth on the hotel online booking process. Pan et al. (2013) evaluated various types of information such as interface features, images, and texts in influencing users' search strategies, and, particularly, they highlighted the importance of using images to reduce information overload and induce hedonic aspects of the user experience.

As argued by Pan et al. (2013), online searching and purchasing of the hotel product is a complex matter in that various system characteristics and product information are evaluated by online users in a dynamic, interactive way. While many of these product/system aspects have been examined, literature on how hotel location information contributes to this process seems disproportionately scarce compared to its significance in the consumer's decision making task. In general, location has been treated as a uni-dimensional construct in existing studies. Most of the studies focus on the relative importance of location instead of what it means for someone in search of a product solution. It is argued that a hotel's location can be used to not only connote convenience and accessibility but also inspire users to search for, or to identify, opportunities for the co-creation of experience (Chathoth, Altinay, Harrington, Okumus, & Chan, 2013). In order to provide systematic, meaningful location information to support consumers' search and process, it is therefore essential to understand how consumers perceive hotel location in the online setting.

### 3 Research Design, Data, and Methods

Due to its growing significance in the information ecosystem, social media has huge potential for harvesting the "wisdom of crowds" in a variety of fields (Fan & Gordon, 2014). Particularly, online reviews have been increasingly considered as ideal sources of data for understanding the hotel industry based upon consumer perceptions of the product. Mining this data enables a better understanding of the product, as well as the industry as whole, as perceived by consumers, which may lead to the (re)formulation of competitive strategies and practices for the firm (e.g., Xiang, Schwartz, Gerdes, & Uysal, 2015). In order to achieve the research goal, a text analytics exercise was conducted to (1) deconstruct the guest experience as reflected in hotel customers' online reviews; (2) identify and understand the factors of guest experience related to hotel location; and, (3) evaluate the usefulness of this

knowledge within the context of online information search and purchase of the hotel product.

A stratified sample of hotel properties was drawn from the population of Manhattan hotels in New York City in the US. Manhattan was chosen because of its high number of hotel properties in a relatively small geographical area with a wide variation in service levels. A list of all the three-, four-, and five-star hotel properties was compiled using Expedia.com to serve as the sampling frame. One- and two-star properties were not included in analysis, as they have been shown to be relatively homogenous in operation with their competition based on value as opposed to differentiation (Bai, Ghiselli, & Pearson, 2000). Twenty properties from each of the three star ratings were randomly selected, resulting in a total of 60 hotels. One three-star hotel was dropped due to an insufficient number of online reviews, leaving a total sample of 59 properties, representing several locations within Manhattan such as the Time Square, Central Park, Wall Street/Financial District, Chelsea, and East Side, etc.

Online reviews for each property were collected from TripAdvisor.com through the use of a web scraper written in the R statistical package. TripAdvisor was used because it is widely recognized as the leading source of online travel reviews in terms of traveller use (Gretzel & Yoo, 2008). An entire set of English-language reviews were collected on March 16, 2015, with the oldest collected review posted back in early 2005. In total 49,374 reviews were collected with an average of 847 reviews per property. Three-, four-, and five-star properties have average numbers of reviews of 732, 1046, and 728, respectively.

Analysis of the textual data followed the standard text mining procedure involving several steps (Fan & Gordon, 2014). First, the data were “cleaned” by stemming and removing stop words, i.e., words that are grammatically useful but do not contribute to the meanings of the sentences. This yielded 90,095 terms (including unigrams, i.e., terms containing only one word, and bigrams, i.e., terms containing exactly two words in examples such as “Time Square”) mentioned 3,578,789 times throughout the combined set of hotel reviews. Second, these terms were examined using a pre-defined dictionary, i.e., a set of words that had been previously identified as relevant to the hotel product, as well as human coding to identify the domain of hotel guest experience, following a schema developed in Xiang, Schwartz, Gerdes, & Uysal (2015). The results were used to create a term-document matrix with documents represented by all the review text for each hotel property. During this process, location-related terms were identified by human coders. Third, location-related terms were manually grouped into “factors” representing common themes. This technique has been recognized in previous works as a method to better understand similarities and dissimilarities between documents, while maintaining control over the domain (e.g., Abrahams, Fan, Alan Wang, Zhang, & Jiao, 2014). An index was then calculated using the frequency of these factors against the total frequency of the dictionary terms for each property to obtain a hotel’s relative “performance” on those values. This index represents the relative importance of a specific factor for an individual property. For example, if a location factor had a score of 0.5 %, it means this factor was mentioned five times among 1000 times of

using other terms in all the reviews for a specific property. Finally, we applied these indices based upon these location-related factors to the entire sample of hotel properties to describe the market characteristics reflected by hotel location in order to show the usefulness of this knowledge.

## 4 Findings

Table 1 lists the top 60 terms identified as related to the hotel guest experience in collected online reviews. As can be seen, these terms are comparable with those identified in previous research in that they reflect how hotel customers perceive and evaluate their experience of stay (e.g., Stringam & Gerdes, 2010; Xiang et al., 2015). It seems hotel service was seen as the most important aspect of the experience as reflected in terms such as “staff”, “service”, and “clean” with high frequencies. Among all these terms “location” was ranked the fifth, indicating hotel location as a significant factor in the guest experience. It is also noteworthy that, among all the top 60 terms, there were twelve terms (20 %) that were directly connected with hotel location, including “restaurant”, “view”, “timesquare”, “walkingdistance”, and “centrallocation”, as underlined in Table 1. This confirms

**Table 1** Top 60 terms of guest experience in online reviews

Term	N	Term	N	Term	N
Staff	31382	Shower	6730	Lovely	4528
Service	19566	<u>Subway</u>	6411	Problem	4449
Clean	18993	Trip	6357	Drink	4303
Bed	17988	Enjoy	6308	Goback	4180
<u>Location</u>	17288	Frontdesk	6279	Modern	4109
Comfortable	14399	Food	6277	Welcome	4072
Friendly	14080	Wonderful	6164	Charge	3913
Helpful	13640	Elevator	6158	Old	3865
Breakfast	12750	Noise	6011	Business	3850
<u>Restaurant</u>	12719	<u>Quiet</u>	5969	Return	3804
Bathroom	12153	Amazing	5873	Rate	3760
<u>View</u>	11166	Beautiful	5620	Manager	3522
Timesquare	10667	<u>Centralpark</u>	5562	Pleasant	3397
<u>Walkingdistance</u>	10013	Pay	5485	<u>Shopping</u>	3368
<u>Centrallocation</u>	9775	Spacious	5219	Issue	3324
<u>Bar</u>	9446	Free	5175	Complain	3318
Recommend	9355	Sleep	5161	Disappoint	3210
Lobby	8807	Concierge	4746	Luxury	3167
Price	8396	Spend	4728	Wifi	3040
Work	7853	Coffee	4644	<u>Convenient</u>	2998

that hotel location means a lot when customers reflect upon and evaluate their experiences.

Figure 1 also provides visualization of all location-related terms in the semantic space based upon their relative importance. This was generated in the R statistical package using a term co-occurrence matrix. The size of the ellipse indicates the relative weight (based upon frequency) of a term within the review text for all hotels, while the thickness of the connecting lines indicates the frequency of co-occurrences between two terms. As can be seen, terms such as “walkingdistance”, “view”, “restaurant”, “subway”, and “centrallocation” are prominent this semantic space and are frequently connected. It seems accessibility, transportation, convenience, dining, as well as experiential aspects of the stay such as having a good view were central to the location of a hotel. Other terms such as “museum”, “loud”, “theatre”, “overlook”, “attraction”, and “shopping” were also mentioned in online reviews as consumers reflected upon their experiences.

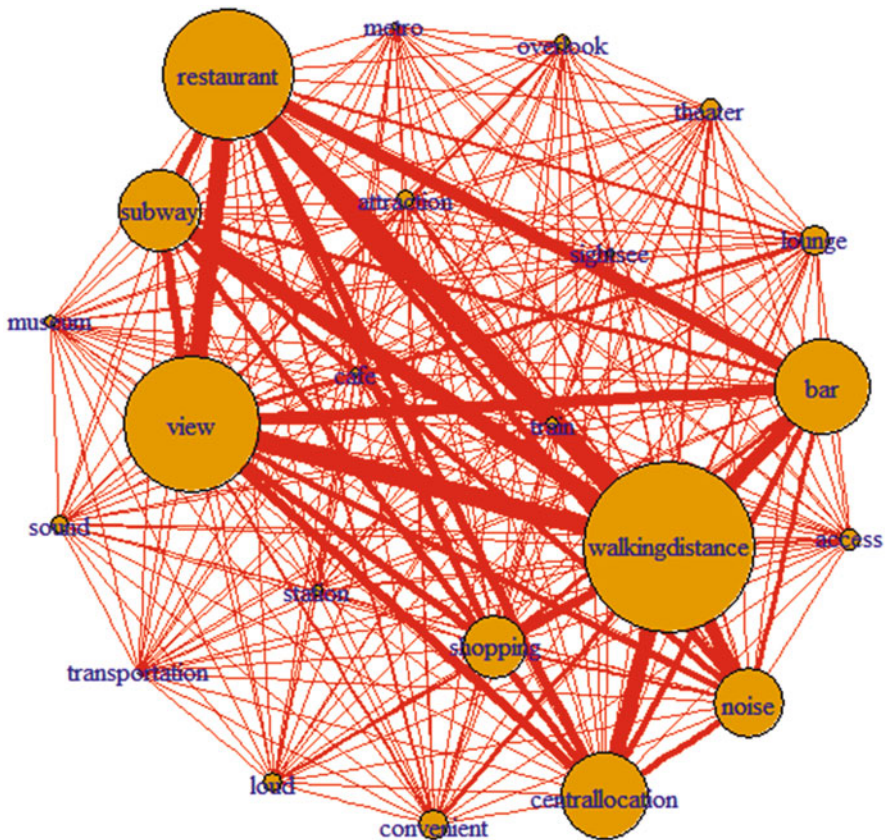


Fig. 1 The Semantic space of location-related terms in online reviews

**Table 2** Location-related factors and associated terms

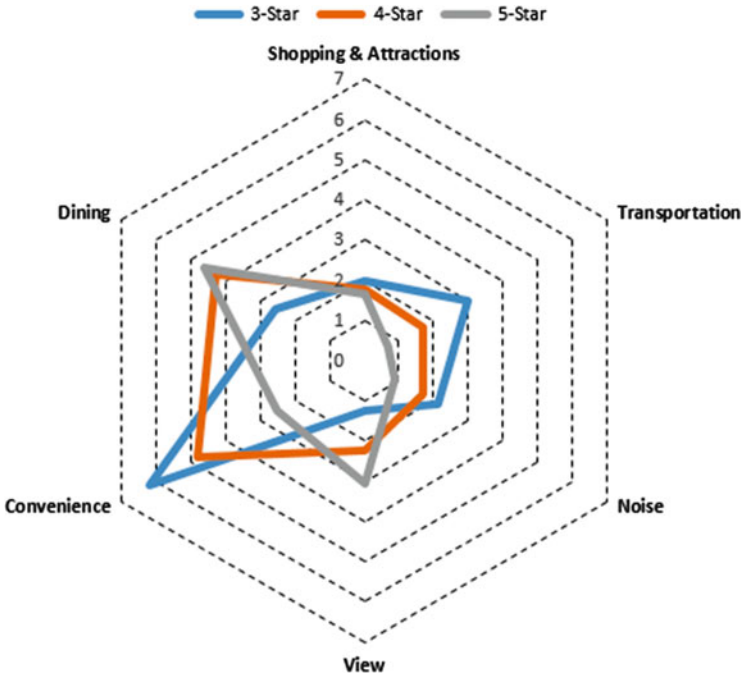
Location-related factors	Terms
Shopping and Attractions	Theater, museum, shopping, attractions
Transportation	Metro, subway, train
Noise	Loud, noise
View	View
Convenience	Central location, walking distance, convenient
Dining	Restaurant, café, bar

Table 2 shows the location-related themes, i.e., “shopping & attractions”, “transportation”, “noise”, “view”, “convenience”, and “dining”, and the associated terms based upon which these themes were generated. These themes appear to be dominant in the text, and to a certain degree they can be seen as perceived value-related factors associated with hotel location. Compared to what’s been found in existing literature using the traditional survey methods (e.g., Lee et al., 2010), these factors are quite similar except that consumers did not mention safety-related issues. This confirms that, as unsolicited sources of data, online reviews reflect how a construct like hotel location is perceived by consumers in their recall and evaluation of their experiences.

To understand the usefulness of this knowledge, we show how hotels with different characteristics (i.e., service level and sub-location) can be evaluated with these factors. We developed an index based upon these six factors by calculating their relative importance within a specific document (i.e., the aggregated review corpus for a specific hotel). This index essentially is the ratio between the total number of occurrences of a specific factor against the total frequency of all hotel experience related terms within that document. Obviously, it reflects the semantic importance instead of the valence of the factor. We then used this index to describe the sampled hotel properties. Figure 2 shows how hotels with different service levels (i.e., star ratings) performed on the six factors (the index was scaled up by 100 times to produce a better visualization). As can be seen, regardless of service level all hotels were perceived similarly on “shopping & attractions” and “dining”, which indicates Manhattan hotels share quite similar tourism/leisure resources. However, three-star hotels in general performed much better than upscale and luxury properties on “transportation” and “convenience”, which may indicate that these midscale hotels are conveniently located or in the proximity of transportation infrastructure and have higher accessibility. Luxury (five-star) hotels appeared to be more highly associated with “view” while not so much with “noise”, indicating they are more withdrawn from normally noisy streets in Manhattan and, in general, may have a better view of the city from the rooms.

Figure 3 shows the performance of hotels at different sub-locations in Manhattan on the six factors (scaled up by 100 times). These sub-locations include Time Square, Central Park, Central Park/Time Square, Wall Street/Financial District, Grand Central/Chelsea, East Side, and other unclassified locations. As can be seen, along “convenience” and “noise” hotels at Time Square, CP/TS, GC/Chelsea, and



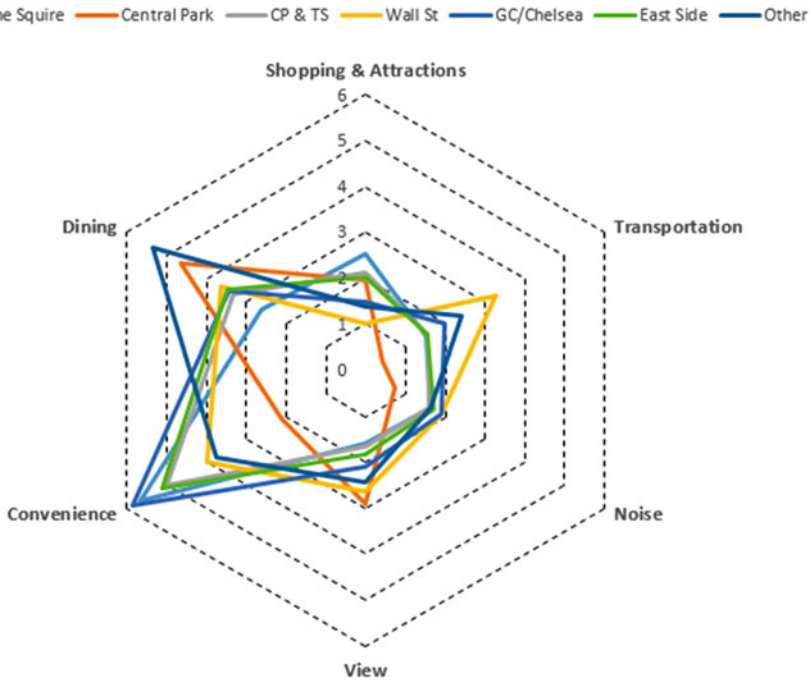


**Fig. 2** Performance of hotel properties on location-related factors (scaled) with different star ratings

East side are quite similar in that these factors were more frequently mentioned. On the “dining” factor, hotels at Central Park and Other locations seemed to have more mentions, while there were less mentions on “convenience” but more on “transportation” for those in the Wall Street/Financial District. It is interesting to see that hotels around Central Park were very low on “convenience” and “transportation”, while they may have a better “view” and less “noise”. This suggests that these sub-locations within Manhattan have their unique characteristics with respect to location-related factors.

## 5 Implications and Conclusions

Location is an important product attribute in consumers’ decision making process. However, there is little research on how we can use location information to support and influence the online information search and purchase behavior. In this study we used hotel customer’s online reviews to identify factors associated with a hotel’s location. The findings show location has rich connotations within a tourist place like Manhattan. The semantic space can be established using text mining tools and location-related factors are “scalable” so that we can use them to describe hotel



**Fig. 3** Performance of hotel properties on location-related factors (scaled) at different locations

sectors/properties in more meaningful ways. Although the results are preliminary and based upon a unique metropolitan destination, this study makes several contributions to social media analytics in hospitality and tourism as well as hotel market communications at large.

First, the findings are in agreement with existing research on consumers’ perception of hotel location conducted using traditional methods such as focus group and surveys (e.g., Lee et al., 2010). In their reflection and evaluation of their experience with a hotel, consumers are highly aware of the location of the hotel and different values associated with it. This attests to the usefulness of the so-called “social media analytics” in gaining insights into the consumer market using existing and even real time data on the Internet (Xiang et al., 2015; Fan & Gordon, 2014). This suggests that social knowledge can be distilled from the unstructured review texts and translated into actionable strategies.

Second, for information system developers (e.g., online travel agencies and hotel websites) the findings suggest that there can be novel ways to mine the online social knowledge and improve the online presentation of hotel location information. Figure 4 illustrates this potential with an imaginary system feature that presents the degree of having a “view” be selecting a hotel within Manhattan. In this case, the larger the ellipse is, the better chance the consumer will get a better view if he/she decides to stay at the hotel. As can be seen, hotels surrounding the Central Park and on the waterfront in Lower Manhattan are likely associated with a better



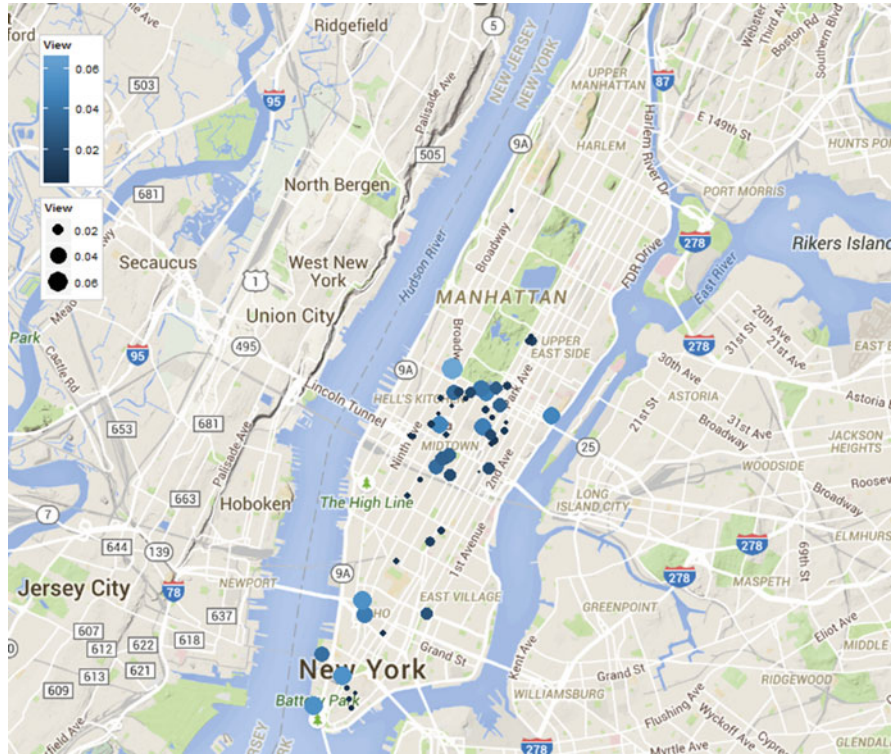


Fig. 4 An illustrative feature using location factors in a recommender system

view. In combination with today’s interactive, immersive technology such as augmented reality and Google Street View, hotel location information can be used in recommender systems to inspire users to better support the online search and booking process for hospitality and tourism product (Fesenmaier et al., 2006).

Third, as suggested by Masiero, Nicolau, & Law, (2015), hotel managers need to understand the marginal utility customers associate with a specific attribute of a hotel in order to develop effective pricing strategy. Location is highly linked with different market segments and local competition and, thus, it is essential for managers to understand how consumers truly perceive the location of their property. As shown in this study, hotels within the same geographic location could be differentiated by perceived values such as convenience, transportation, tourism activities, dining, as well as having a view in the room to experience the destination. This helps hotel managers with the identification and evaluation of who are their true competitors within the same geographic market. With this knowledge hotel managers can develop a more nuanced communication strategy to engage with their customers.

This study points to several directions for future research. Particularly, a hotel’s location is such an important construct that can be used to define the guest/tourist experience at the destination (Shoval, McKercher, Ng, & Birenboim, 2011). Hotel

location plays an important role in the notion of “tourist-activated network”, which has been developed to capture information generated through different activities taking place at different places with the destination (Fesenmaier & Xiang, 2013). As such, understanding the meaning of hotel location and what it entails provides a stepping stone for us to understand how a tourist experiences the place. For example, with the enormous amount of consumer-generated content on the Internet, there are numerous opportunities for us to gain insights into the relationships between hotel location, the process of this experience, as well as the outcomes of this experience. This knowledge can help us better understand the nature of the hotel product as well as the competitive market conditions of the hospitality industry.

## References

- Abrahams, A. S., Fan, W., Alan Wang, G., Zhang, Z. J., & Jiao, J. (2014). An integrated text analytic framework for product defect discovery. *Production and Operations Management*, 24(6), 975–990.
- Arbel, A., & Pizam, A. (1977). Some determinants of urban hotel location: The tourists’ inclinations. *Journal of Travel Research*, 15(3), 18–22.
- Bai, B., Ghiselli, R. F., & Pearson, T. (2000). Market characteristics in economy/budget lodging. *Hospitality Review*, 18(2), 4.
- Baum, J. A., & Mezias, S. J. (1992). Localized competition and organizational failure in the Manhattan hotel industry, 1898–1990. *Administrative Science Quarterly*, 37, 580–604.
- Bull, A. O. (1994). Pricing a motel’s location. *International Journal of Contemporary Hospitality Management*, 6(6), 10–15.
- Chathoth, P., Altinay, L., Harrington, R. J., Okumus, F., & Chan, E. S. (2013). Co-production versus co-creation: A process based continuum in the hotel service context. *International Journal of Hospitality Management*, 32, 11–20.
- Dickinger, A., & Mazanec, J. (2008). Consumers’ preferred criteria for hotel online booking. *Information and Communication Technologies in Tourism, 2008*, 244–254.
- Dolnicar, S., & Otter, T. (2003). *Which hotel attributes matter? A review of previous and a framework for future research*. Working paper.
- Dubé, L., & Renaghan, L. M. (2000). Creating visible customer value: How customers view best-practice champions. *The Cornell Hotel and Restaurant Administration Quarterly*, 41(1), 62–72.
- Ert, E., & Fleischer, A. (2014). Mere position effect in booking hotels online. *Journal of Travel Research*, 0047287514559035.
- Fan, W., & Gordon, M. D. (2014). Unveiling the power of social media analytics. *Communications of the ACM*, in press (June 2014), 26.
- Fan, W., Wallace, L., Rich, S., & Zhang, Z. (2006). Tapping the power of text mining. *Communications of the ACM*, 49(9), 76–82.
- Fesenmaier, D. R., Wöber, K. W., & Werthner, H. (Eds.). (2006). *Destination Recommendation Systems: Behavioral Foundations and Applications*. CABI.
- Fesenmaier, D. R., & Xiang, Z. (2013). Tourism marketing from 1990–2010: Two decades and a new paradigm. In S. McCabe (Ed.), *The handbook of tourism marketing* (pp. 549–560). London: Routledge.
- Gretzel, U., & Yoo, K. H. (2008). Use and impact of online travel reviews. *Information and Communication Technologies in Tourism, 2008*, 35–46.

- Kim, W. G., & Kim, D. J. (2004). Factors affecting online hotel reservation intention between online and non-online customers. *International Journal of Hospitality Management*, 23(4), 381–395.
- Law, R., & Cheung, C. (2006). A study of the perceived importance of the overall website quality of different classes of hotels. *International Journal of Hospitality Management*, 25(3), 525–531.
- Lee, K. W., Kim, H. B., Kim, H. S., & Lee, D. S. (2010). The determinants of factors in FIT guests' perception of hotel location. *Journal of Hospitality and Tourism Management*, 17(01), 167–174.
- Lewis, R. C. (1985). Predicting hotel choice: The factors underlying perception. *Cornell Hotel and Restaurant Administration Quarterly*, 25(4), 82–96.
- Masiero, L., Nicolau, J. L., & Law, R. (2015). A demand-driven analysis of tourist accommodation price: A quantile regression of room bookings. *International Journal of Hospitality Management*, 50, 1–8.
- McCleary, K. W., Weaver, P. A., & Hutchinson, J. C. (1993). Hotel selection factors as they relate to business travel situations. *Journal of Travel Research*, 32(2), 42–48.
- Medlik, S. (1993). *Dictionary of Transport, Travel and Hospitality*.
- Pan, B., Zhang, L., & Law, R. (2013). The complex matter of online hotel choice. *Cornell Hospitality Quarterly*, 54(1), 74–83.
- Ricci, F. (2002). Travel recommender systems. *IEEE Intelligent Systems*, 17(6), 55–57.
- Rudnansky, R. (2013). Online hotel bookings up big over last year. *Travelpulse.com*. Available at <http://www.travelpulse.com/news/hotels-and-resorts/report-online-hotel-bookings-up-big-over-last-year.html>.
- Saga, R., Hayashi, Y., & Tsuji, H. (2008, October). Hotel recommender system based on user's preference transition. In *Systems, Man and Cybernetics*, 2008. SMC 2008. IEEE International Conference on (pp. 2437–2442). IEEE.
- Shoval, N., McKercher, B., Ng, E., & Birenboim, A. (2011). Hotel location and tourist activity in cities. *Annals of Tourism Research*, 38(4), 1594–1612.
- STRanalytics (2014). *Who's in your competitive set?* Retrieved from [https://www.strglobal.com/Media/Default/Samples/NNA\\_samples/NNA\\_CompSetSuite\\_Details.pdf](https://www.strglobal.com/Media/Default/Samples/NNA_samples/NNA_CompSetSuite_Details.pdf) on November 9, 2014.
- Stringam, B. B., & Gerdes, J., Jr. (2010). An analysis of word-of-mouth ratings and guest comments of online hotel distribution sites. *Journal of Hospitality Marketing & Management*, 19(7), 773–796.
- Xiang, Z., Schwartz, Z., Gerdes, J., & Uysal, M. (2015). What can big data and text analytics tell us about hotel guest experience and satisfaction? *International Journal of Hospitality Management*, 44, 120–130.
- Xiang, Z., Wang, D., O'Leary, J. T., & Fesenmaier, D. R. (2015). Adapting to the Internet: Trends in travelers' use of the Web for trip planning. *Journal of Travel Research*, 54(4), 511–527.
- Yang, Y., Luo, H., & Law, R. (2014). Theoretical, empirical, and operational models in hotel location research. *International Journal of Hospitality Management*, 36, 209–220.
- Ye, Q., Law, R., Gu, B., & Chen, W. (2011). The influence of user-generated content on traveler behavior: An empirical investigation on the effects of e-word-of-mouth to hotel online bookings. *Computers in Human Behavior*, 27(2), 634–639.

# Hotel Responses to Guests' Online Reviews: An Exploratory Study on Communication Styles

Angelo Bonfanti, Vania Vigolo, and Francesca Negri

**Abstract** This study explores the communication approaches used by hotel managers in responding to their guests' online reviews. Data were collected from one of the largest hotel booking websites (Booking.com). Specifically, 447 responses provided by hotel managers belonging to an international chain (Best Western) were analysed within the ethos/logos/pathos framework. The findings highlight that hotel managers tend to adopt either a company-focused or a customer-focused style in their responses. Suggestions for practitioners are provided for effectively responding to online guest reviews.

**Keywords** Hotels • Online reviews • Review management strategies • Customers compliments and complaints • Hotel service quality • Written communication styles

## 1 Introduction

In making their travel decisions, customers often collect information from a variety of sources, including the Internet. With the Web 2.0, customers have free and easy access to reviews posted anonymously by means of an avatar or nickname from previous customers (Buhalis & Law, 2008). Online reviews specialists websites (e.g., TripAdvisor, Yelp, & Oyster), online travel agencies (e.g., Travelocity and Orbitz), online accommodation booking websites (e.g., Expedia and Booking.com), forums (e.g., EComplaints.com, Holidays Uncovered, HotelChatter), blogs and social media (e.g., Facebook, Twitter, Instagram) have become the most popular e-tools in which travellers can find information about destinations, hotels and other travel services (e.g., Ayeh, Au, & Law, 2013; Loo, Boo, & Khoo-Lattimore, 2013; Mauri & Minazzi, 2013). In other terms, online reviews are public and global powerful sources of information about positive and negative service experiences (e.g., Levy, Duan, & Boo, 2013; Litvin, Goldsmith, & Pan, 2008). Electronic word-

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of-mouth (eWOM) is growing strongly by means of the reviews posted on the web. According to Serra Cantallops and Salvi (2014), hotels are the most affected by eWOM. As reported by Tnooz (2014), a recent global PhoCusWright survey indicated that over 80 % of tourists read numerous reviews before deciding in which hotel to stay and 53 % indicated that they would not be willing to book a hotel that had no reviews. Travellers perceive online reviews as up-to-date, reliable (Murphy, Mascardo, & Benckendorff, 2007), trustworthy, credible (e.g., Ayeh et al., 2013) and helpful (e.g., Gretzel & Yoo, 2008), more than information supplied by service providers and marketers (Gretzel & Yoo, 2008). This happens because online reviews are based on personal experiences. Even though the information posted online might be biased, e-reviews have a very strong impact on readers/customers. Online reviews can help other consumers to gain information about products and services, therefore affecting their purchasing decisions (e.g., Cheng & Loi, 2014; Dickinger & Mazanec, 2008; Filieri & McLeay, 2014; Ladhari & Michaud, 2015), trust towards a hotel, risk perception, hotel brand awareness, hotels comparison, and product acceptance (Serra Cantallops & Salvi, 2014). Therefore, online reviews can encourage or discourage travellers in visiting destinations and selecting hotels. According to Tsao, Hsieh, Shih, and Lin (2015, p. 100), “the influence of consumer reviews on online third-party travel intermediaries is receiving more attention from practitioners and academics” and “they are expected to become part of the mainstream in future internet marketing for the hotel industry”. One of the crucial research paths regards how to manage customers’ online reviews successfully. This is vital for hotel managers because an effective response approach can strengthen the relationships with satisfied guests and provide convincing explanations about service failure. Very few studies examined how hotel managers effectively to respond to their guests (e.g., Cheng & Loi, 2014; Min, Lim, & Magnini, 2015; Park & Allen, 2013).

This paper aims to contribute to fill this research gap by undertaking an exploratory analysis aimed at understanding if and how hotels managers respond to their guests’ online reviews (GOR). More specifically, using a content analysis of data collected from one of the largest hotel booking websites (Booking.com), this study identifies the two major communication styles used from hotels managers in responding to e-reviews. Three hotels in Rome (Italy) belonging to an international hotel chain (Best Western) and 447 hotels’ responses are considered. The study is structured as follows. After a literature review about hotels’ responses to online reviews, this paper details the methodological approach. The results are proposed and discussed. Finally, it concludes with managerial implications, limitations and directions for further research.

## 2 Literature Review

Most research about online reviews has focused on the customer's perspective, whereas few studies have addressed this topic from the company's standpoint. In general, two main streams of research about online reviews can be found in tourism and hospitality literature: a) the importance of responding to customers' online reviews, and b) hotels managers' responses to online reviews.

### 2.1 The Importance of Responding to Customers' Online Reviews

While most studies about eWOM emphasize the role of online reviews for customers and their impact on customers' decision-making process (Vermeulen & Seegers, 2009), little attention has been paid to the impact of online reviews on hotels. Drawing on Serra Cantallops and Salvi (2014), Table 1 summarises the main types of impact that online reviews can have on hotels according to hotel management literature. Specifically, reviews can affect hotels' brand image and online reputation, customers' attitude towards the hotel, loyalty, revenues and the possibility to get price premiums. In addition, they can affect specific marketing strategies and improve service quality control. Therefore, online reviews represent a powerful tool for hotel managers to gain knowledge about their customers, developing effective relationships with them, and reacting to service failure (Escobar-Rodríguez & Carvajal-Trujillo, 2014; Ladhari & Michaud, 2015). In general, O'Connor and Frew (2004) argued that close relationships between customers

**Table 1** Impacts of online reviews on hotels

Impact type	Author(s), year
Brand image	Litvin et al. (2008)
Online reputation	Loureiro & Kastenholtz (2011), Marchiori & Cantoni (2012), Serra Cantallops & Salvi (2014)
Future attitude towards the hotel	Jeong & Jeon (2008), Vermeulen & Seegers (2009)
Loyalty	Ladhari & Michaud (2015), O'Connor & Frew (2004)
Revenues and price	Ghose & Ipeiritis (2011), Ögüt & Onur Taş (2012), Yacouel & Fleischer (2012), Ye, Law, & Gu (2009)
Customer interactions and service failure	Loureiro & Kastenholtz (2011)
Quality control and improvement	Loureiro & Kastenholtz (2011)
Specific marketing strategies	Yacouel & Fleischer (2012)



and suppliers can reduce the risk of substitution and help to insure log-term profitability.

## ***2.2 Hotel Managers' Responses to Online Reviews***

In the tourism and hospitality management literature, scholars have mainly investigated if, what and how hotel managers should respond to online reviews. Vásquez (2014) conducted a survey about this issue on TripAdvisor: he observed that in 2008 the response rate was only 1 % while a few years later it had risen to over 10 %. Also O'Connor's (2010) research maintained that approximately 10 % of the reviews had received a response from the hotel. Park and Allen (2013) found a response rate of about 18 % with a higher rate (around 41 %) to negative reviews and lower (around 17 %) to positive reviews. Therefore, there seems to be an increasing trend in responses to guests' online reviews. Another aspect dealt with in literature is what hotel managers should respond to online reviews. Levy et al.'s (2013) research examined 1946 one-star reviews from ten popular online review websites and 225 management responses from 86 Washington D.C. hotels. They found that contents of responses included appreciation, apologies and explanations for what had gone wrong rather compensation adjustments. On a sample of 150 conversations posted on TripAdvisor, Sparks and Bradley (2014) developed a framework of 19 managerial responses to adverse online reviews of hotel accommodation identified with "Triple A" corresponding to acknowledgment, accounts and actions. More specifically, "acknowledgment" includes the following contents: thank for review, recognize events occurred, apology that the event happened, admit implications/adverse effects for the person, appreciation for comments, non-acceptance or dismissal, and accept responsibility. Justification, denial, excuse, penitential and reframe explain the category defined as "accounts" equivalent to explanation. In terms of "actions", referral to relevant area of hotel, refurbishment-repair, contact hotel directly, investigate with no action, offer compensation, implement/change training, alter policy are the initiatives that can be taken by service providers to address the source of customers' complaints. Zhang and Vásquez (2014) examined about 80 hotel responses that were posted on TripAdvisor to respond to online consumer complaints. In terms of structure of these responses, they identified ten move types: (1) express gratitude, (2) apologize for sources of trouble, (3) invitation for a second visit, (4) opening pleasantries, (5) proof of action, (6) acknowledge complaints/feedback, (7) refer to customer reviews, (8) closing pleasantries, (9) avoidance of reoccurring problems, and (10) solicit response. With reference to 3, 4 and 5-star hotels in Lugano (Switzerland), De Ascaniis, Borrè, Marchiori, and Cantoni (2015) proposed 13 rhetorical moves used by hotels to respond to customers' reviews: (1) allocution, (2) gratitude, (3) acknowledgment, (4) invitation to return, (5) salutation, (6) integration, (7) clarification/correction, (8) apology, (9) request for more details, (10) compensation, (11) notify to the proper person, (12) denial, and (13) understanding.

Little is known about how hotels managers can effectively respond to online reviews (Sparks & Bradley, 2014). In terms of communication, Zhang and Vázquez (2014) found that the responses provided by 4- and 5-star hotels were highly formulaic and conventionalised: general responses without any detailed explanation were provided and the same lexical and syntax were repeated. In addition, hotel staff tended to emphasize corporate identity rather than personal identity in responding to complaints. In this regard, Min et al. (2015) suggested the importance of following the same principles as when answering face-to-face customer complaints. Especially, they examined the role of empathy statements, problem paraphrasing, and speed of response. They recommended to respond promptly and write in a personal, empathic and specific way. In their research, Sparks and Bradley (2014) found that the communication style used in hotels' responses adopted a professional, friendly-informal, and non-defensive style.

### 3 Research Method

#### 3.1 *Sample Selection and Data Collection*

A qualitative approach was taken in this study, given that it is important to conduct qualitative research in the hospitality and tourism industry with specific area of online reviews, in particular e-complaints (Lee & Hu, 2004; Sparks & Browning, 2010). In order to analyse the style of the responses to GOR, a total of 447 responses were collected from Booking.com. Booking.com is the most significant brand of Priceline Group Inc. and today represents the world's leading brand for online accommodation reservations. Each day, over 900,000 room nights are reserved on Booking.com. Unlike other websites that host consumer reviews, Booking.com requires reviewers to book a hotel on its website and stayed at the property in question before being allowed to write a review. Therefore, reviews published on this website come from real guests. Since Booking.com features over 57 million hotel reviews, the sample was selected to meet certain characteristics. This research focused on Best Western as one of the largest hotel chains in the world (MKG Hospitality, 2015). Even though hotel chains are reported to pay particular attention to online reviews, few studies have focuses on specific hotel chains, and recent studies have recommended to address this gap in literature (e.g., Serra Cantallops, & Salvi, 2014). The city of Rome (Italy), was selected because it is one of the main Italian tourist destinations, attracting more 13 million tourists in 2014. All the 17 Best Western hotels located in Rome were first explored. To facilitate interpretation, only reviews and responses written in Italian and in English were considered, for a total of 1564 reviews (Table 2). It was a priori and arbitrarily established that the threshold for the response rate should be greater than 20 %. After an initial screening, it emerged that only three hotels (one three-star and two four-star hotels belonging to this chain) consistently gave responses to online reviews, with a



**Table 2** Response rate to GOR

	Hotel 1		Hotel 2		Hotel 3		Overall Hotels		
	IT	EN	IT	EN	IT	EN	IT	EN	IT + EN
Total GOR	81	26	334	537	207	379	622	942	1564
Responses	23	14	79	134	42	155	144	303	447
Response rate (%)	28.40	53.85	23.65	24.95	20.29	40.90	23.15	32.17	28.58
Responses to positive GOR	13	4	42	57	22	52	77	113	190
<i>% of responses to overall GOR</i>	<i>9.03</i>	<i>1.32</i>	<i>29.17</i>	<i>18.81</i>	<i>15.28</i>	<i>17.16</i>	<i>53.47</i>	<i>37.29</i>	<i>42.51</i>
Responses to negative GOR	2	0	1	2	2	6	5	8	13
<i>% of responses to overall GOR</i>	<i>1.39</i>	<i>0</i>	<i>0.69</i>	<i>0.66</i>	<i>1.39</i>	<i>1.98</i>	<i>3.47</i>	<i>2.64</i>	<i>2.91</i>
Responses to mixed GOR	8	10	36	75	18	97	62	182	244
<i>% of responses to overall GOR</i>	<i>5.56</i>	<i>3.30</i>	<i>25</i>	<i>24.75</i>	<i>12.50</i>	<i>32.01</i>	<i>43.06</i>	<i>60.07</i>	<i>54.59</i>

response rate ranging from 20.29 % to 40.90 %. The other hotels had a lower response rate (mostly lower than 5 %), and were therefore excluded from the sample. The final sample consisted of 447 responses to 447 unique customers reviews posted on Booking.com during the last 24 months (from 1st September 2013 to 31st August 2015), with a total of 85,817 words. The average word count for hotel responses was 192 words, ranging from 9 words for the shortest response to the 618 words for the largest response. Each response (and related review) represented a case. All responses and reviews were considered regardless of the overall rating provided by guests. The full text of each response was copied into a spreadsheet (word document) for subsequent analysis with Qualitative Solutions and Research (QSR) NVivo 10, a software program for qualitative data analysis.

### 3.2 Data Analysis

Before conducting content analysis, the data were pre-processed. On the basis of Xiang, Schwartz and Uysal's (2015) research, this first step included stemming (i.e., coding several forms of a linguistic entity into a 'rudimentary' form which represents the same meaning), misspelling identification, and elimination of stop words such as certain articles, pronouns, adverbs, and conjunctions (e.g., the, I/we, this, and) as well as the identification number associated by researchers to reviews and responses. By means of NVivo software, one of the researchers coded the data sources one at a time and examined the relationships between codes/themes. The other researchers were charged with independently verifying the coding schema in order to triangulate results and move to fewer relevant codes.

## 4 Analysis and Discussion of the Results

After a brief description of the data used in the analyses, this section presents and discusses the main communication elements identified in the hotel responses and the two communication styles emerged from content analysis.

### 4.1 *Hotel Responses to GOR*

In the last 24 months, the three hotels examined received 622 Italian and 942 English reviews on Booking.com, for a total of 1564 online reviews, as summarised in Table 2. Overall, these hotels provided 447 responses (response rate: 28.58 %), 144 in Italian (response rate: 23.15 %) and 303 in English (response rate: 32.16 %). These data support hotels' ongoing trend in responding to online reviews emerged in previous studies (Zhang & Vásquez, 2014). The researchers judged that 190 reviews were "positive", 13 were "negative", and 244 were "mixed" (i.e. including both positive and negative comments about the hotel experience). The majority of responses in Italian addressed positive reviews, followed by mixed reviews and complaints, while the majority of responses in English addressed mixed reviews, followed by positive reviews and negative reviews.

### 4.2 *Main Communication Elements of Hotel Responses*

Drawing on the theoretical model developed by Bacarani and Bonfanti (2015) for oral communication, the themes inductively emerged from hotel responses are related to three aspects: (1) content, (2) credibility, and (3) emotional impulses. These three themes recall the factors of persuasion proposed in the Aristotelian philosophy of rhetoric: *logos*, *ethos* and *pathos*, respectively. More specifically, *logos* includes the communication aspects related to the content of hotel responses. In this sense, the exploratory analysis revealed the following actions (in alphabetic order): apologising, circumscribing the negative aspects, clearly presenting the facts, closing with greetings and signature, communicating complacency, defending or justifying the personal staff (or company's products), expressing gratitude and thanking, highlighting the merits, inviting to return, lightening wrong, not admitting wrong, proposing compensation, providing explanations for what had gone wrong during the service delivery, shifting the blame to others and warmly and moderately greeting. This study highlights that the most common moves in hotel responses outlined in previous studies (e.g. De Ascaniis et al., 2015; Levy et al., 2013; Zhang & Vásquez, 2014) pertain to the *logos* dimension. In other terms, hotel managers tend to focus more on the content of the response

than on its style (i.e. responding in a credible and compelling, heartfelt and emotional manner). Therefore, these actions do not address the aspects of *ethos* and *pathos*.

In this study, *ethos* is intended as the ability of the writer (i.e. hotel manager or staff) to communicate a trustworthy response by using an essential and personal writing tone. In this regard, the findings revealed that, in their responses, managers acknowledge shared values or beliefs, use *captatio benevolentiae*, communicate professionalism (Bonfanti & D'Allura, 2014), personality, authenticity, sincerity, spontaneity, awareness, trustworthiness, and expertise, mention past successful service delivery, remain natural and honest, use a form of communication that is comfortable for reader, and utilise verbs with active form while they respond to GOR. Conversely, some hotel responses were written in a cloying and wordy way or with conventional phrases, and were closed with abbreviations.

Finally, *pathos* is intended as the ability to stimulate favourable emotional impulses in readers. Hotel responses examined in this work highlighted the following communication elements: to tell a personal service experience for the customer who stayed in the hotel, express comprehension, sincere regret and desire to remedy, provide information in an emotional way by means of “cold” (i.e. hasty and apathetic) or “warm” (empathic) communication, refer to values, use a flat or original writing tone, and worry about others’ feelings.

### 4.3 *Communication Styles in Hotel Responses*

When responding to online reviews, it is important to develop a writing style because “the style of a business message must match the strategic objective of its author for that message to be effective and appropriate” (Campbell, Brammer, & Ervin, 1999, p. 72). According to Fielden (1982, p. 129), style is as follows: “In the feelings and images associated with each word lies the capacity a writing style has for producing an emotional reaction in a reader. And in that capacity lies the tone of a piece of writing. Style is largely a matter of tone. The writer uses a style; the reader infers a communication’s tone. Tone comes from what a reader reads into the words and sentences a writer uses”. Accordingly, the communication elements emerged from the responses can be classified in two opposite writing styles following the *logos*, *ethos* and *pathos* model (Table 3).

The first written communication style can be defined as company-focused. Given that it embodies a writer-focused communication approach, this style is adopted when hotel managers emphasize the service offered by the hotel, the company image or reputation, while not worrying about customers’ perceptions. The second style is customer-focused because the response is provided by considering the reader’s perspective. In other terms, readers become the protagonists of the online response formulated in such a way that they can perceive personalisation and possible benefits from their reviews. These styles are relevant to hotel management because they can affect (positively or adversely) customers who could

**Table 3** Written communication styles from hotels responses to GOR

	Company-focused communication style	Customer-focused communication style
Logos	Communicating complacency	Apologising
	Defending	Circumscribing negative aspects
	Justifying	Clearly presenting the facts
	Lightening wrong	Closing with greetings and signature
	Not admitting wrong	Expressing gratitude and thanking
	Shifting the blame to others	Expressing gratitude and thanking
		Inviting to (personalised) return
	Highlighting the merits	
	Proposing compensation	
	Proving explanations for service failure	
Ethos	Being cloying and wordy	Acknowledging shared values or beliefs
	Closing with abbreviations	Adopting <i>captatio benevolentiae</i>
	Using conventional phrases	Communicating professionalism, personality, authenticity, sincerity, spontaneity, awareness, trustworthiness, and expertise
	Using verbs with passive form	Greeting warmly and moderately
	Mentioning past successful service delivery	
	Remaining natural and honest	
	Using an essential and personal writing tone	
Pathos	Providing hasty and standardised responses	Expressing comprehension, sincere regret and desire to remedy
	Using a flat writing tone	Providing information in emotional way
	Using "cold" communication	Referring to values
		Telling a personal service experience for the person who writes or stayed in hotel
		Using an original writing tone
		Using "warm" communication
		Worrying about the others' feelings

read online reviews. Table 4 proposes some examples derived from the hotel responses (HR) analysed in this study.

## 5 Practical Implications

Several implications for hotels managers can be considered. First, given that responding to GOR is important because of the effects on other customers and on the firm's competitiveness, hotel managers (or personnel staff) should respond to

**Table 4** Examples of written communication styles

	Company-focused communication style	Customer-focused communication style
Logos	“Sorry, but you should have asked the receptionists how to reach the station. They are very helpful. Often people forget to give adaptors back and it may happen that we do not have any. As for the breakfast, did you try boiled eggs with extra virgin olive oil and fresh tomatoes or hot carrots with oregano with fresh ricotta? Waiting for you to visit us again, regards” (HR1)	“Dear Mr Ayaz, we have read your review and please accept our apologies for the bad experience you have had. Our main aim is the satisfaction of our guest, for that reason we should be grateful if you could be so kind to let us know at what time you had the check in and what happened with the receptionist” (HR79)
Ethos	“Our Hospitality Concept is committed to provide the highest standard of service and grant all your wishes, we strive to impress memories and experiences to all our guests” (HR375) (comment to positive review)	“Dear Guest, thank you for your review, we try our best to deliver a good service and receiving a positive feedback make us feel happy. Best regards xxx Front Office Manager” (HR406)
Pathos	“Thank you for your review. Sorry for the inconvenience. We shall manage to solve this problem. Waiting for you to come again, regards” (HR54)	“We are glad to hear you appreciated our services though we regret you had not the chance to stay in one of our Fashion rooms. We have many typologies of rooms and I am sure that if you had asked, our front desk staff would have moved you to a different room more suitable for you” (HR139)

GOR in the case of both compliments and complaints. This work highlights that the response rate to online reviews is still low. It is in the interest of hotel managers to create and share a set of measurable, clear and achievable metrics to stimulate a higher response rate for the next future. Some goals to consider might be, for instance: disregarded reviews rate, hold time (in days), resolution rate, and thankfulness rate. Another aspect outlined in this paper is the importance of how to write responses. Unlike previous studies about hotel responses (De Ascianiis et al., 2015; Levy et al., 2013; Zhang & Vásquez, 2014), this research recommends managers to develop their written communication skills by paying attention not only to the *logos* dimension of the response, but also to other communication elements such as *ethos* and *pathos*. That means that the top management might consider training hotel chain employees not only on “hard skills” (such as response rate and waiting time), but also on “soft skills”, stressing the attention on how to achieve empathy and sympathy. A “Reviews’ Management Handbook” can be created and spread among employees, with a heavy use of positive and negative examples in managing reviews. Transforming a threat as an online review in an opportunity by means of an effective response to customers cannot be left to chance. Managers need to carefully develop their business writing skills by means of appropriate training courses. In addition, hotel managers could organise focus groups to gather customers’ perceptions about the quality of hotel responses. In this way, managers

could understand the impact of their responses posted online. Finally, hotel managers could consider helping customers in providing detailed and constructive reviews. During the check-out moment, or even after the stay, hotel managers could elicit customers with a list of features to be considered in writing the reviews. To reward this valuable collaboration, the hotel management could plan to provide some advantages in the fidelity program. At the same time, hotel managers should be very precise in communicating that the usefulness of the reviews rather than their positive content will be rewarded. This kind of recall could have some positive outcomes: the hotel chain could get useful insights, and customers would perceive that the hotel cares about them also after their stay, and this awareness might help to tone down customers willing to leave negative reviews.

## 6 Conclusions

This research investigated if and how hotel managers respond to guests' online reviews. From the results, two opposite written communication styles emerged that are original from a theoretical and practical point of view. On the one hand, the findings contribute to develop the academic debate about how to respond to online compliments and complaints, issue hitherto mainly explored from the customer's perspective. On the other hand, they can be taken as a reference by hotel managers wishing to write more effective responses to online reviews. This study identified some practical tools hotel managers could use to write effective customer-focused online responses. However, this research has several limitations that should be addressed in future studies. This is an exploratory study and the reviews are limited to one hotel chain in one Italian city. Further research could expand the data to include other cities from the same hotel chain around the world and other hotel chains, as well. In addition, it would be interesting to explore whether hotel chains and independent hotels differ in terms of online review management. In addition, it has been argued that for hotels with established reputation, such as hotel chains, exposure to online reviews is less important in terms of booking intentions than for lesser-known hotels (Vermeulen & Seegers, 2009). Therefore, it would be interesting to investigate the effect of different styles of online responses on tourists' booking intentions, and the moderating role of a hotel's brand image.

This paper is a starting point for future studies. From the methodological point of view, it could be interesting to adopt the T-LAB software (e.g., Cortini and Tria, 2014) as a text mining and computational linguistics-based tool. While with NVivo software it was possible to identify how hotel managers respond to guests' online reviews, by means of T-LAB software it will be possible to conduct text mining, automatic lemmatisation and key-term identification. As a result, it will be possible to carry out, for example, thematic analyses on hotel managers' responses to GOR, or comparative analyses between different written communication styles.

## References

- Ayeh, J. K., Au, N., & Law, R. (2013). "Do we believe in TripAdvisor?" Examining credibility perceptions and online travelers' attitude toward using user-generated content. *Journal of Travel Research*, 52(4), 437–452.
- Baccarani, C., & Bonfanti, A. (2015). Effective public speaking: A conceptual framework in the corporate-communication field. *Corporate Communications: An International Journal*, 20(3), 375–390.
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management*, 29(4), 609–623.
- Bonfanti, A., & D'Allura, G. M. (2014). L'incidenza della professionalità sul valore percepito dal cliente e sulla sua soddisfazione durante il service encounter. *Sinergie Italian Journal of Management*, 95, 99–120.
- Campbell, K. S., Brammer, C., & Ervin, N. (1999). Exploring how instruction in style affects writing quality. *Business Communication Quarterly*, 62(3), 71–86.
- Cheng, V. T. P., & Loi, M. K. (2014). Handling negative online customer reviews: The effects of elaboration likelihood model and distributive justice. *Journal of Travel & Tourism Marketing*, 31(1), 1–15.
- Cortini, M., & Tria, S. (2014). Triangulating qualitative and quantitative approaches for the analysis of textual materials: An introduction to T-lab. *Social Science Computer Review*, 32(4), 561–568.
- De Ascaniis, S., Borrè, A., Marchiori, E., & Cantoni, L. (2015). Listen to your customers! How hotels manage online travel reviews. The case of Hotels in Lugano. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015*. Switzerland: Springer International Publishing.
- Dickinger, A., & Mazanec, J. (2008). Consumers' preferred criteria for hotel online booking. In P. O'Connor, W. Höpken, & U. Gretzel (Eds.), *Information and communication technologies in tourism 2008*. Vienna: Springer.
- Escobar-Rodríguez, T., & Carvajal-Trujillo, E. (2014). Online purchasing tickets for low cost carriers: An application of the unified theory of acceptance and use of technology (UTAUT) model. *Tourism Management*, 43, 70–88.
- Fielden, J. S. (1982). What do you mean you don't like my style? *Harvard Business Review*, 60, 128–138.
- Filieri, R., & McLeay, F. (2014). E-WOM and accommodation an analysis of the factors that influence travellers' adoption of information from online reviews. *Journal of Travel Research*, 53(1), 44–57.
- Ghose, A., & Ipeirotis, P. G. (2011). Estimating the helpfulness and economic impact of product reviews: Mining text and reviewer characteristics. *IEEE Transactions on Knowledge and Data Engineering*, 23(10), 1498–1512.
- Gretzel, U., & Yoo, H. K. (2008). Use and impact of online travel reviews. In P. O'Connor, W. Höpken, & U. Gretzel (Eds.), *Information and communication technologies in tourism 2008*. Vienna: Springer.
- Jeong, M., & Jeon, M. (2008). Customer reviews of hotel experiences through consumer generated media (CGM). *Journal of Hospitality & Leisure Marketing*, 17(1–2), 121–138.
- Ladhari, R., & Michaud, M. (2015). eWOM effects on hotel booking intentions, attitudes, trust, and website perceptions. *International Journal of Hospitality Management*, 46, 36–45.
- Lee, C. C., & Hu, C. (2004). Analyzing hotel consumers' E-complaints from an Internet complaint forum. *Journal of Travel & Tourism Marketing*, 17(2/3), 167–181.
- Levy, S. E., Duan, W., & Boo, S. (2013). An analysis of one-star online reviews and responses in the Washington D.C. lodging market. *Cornell Hospitality Quarterly*, 54(1), 49–63.
- Litvin, S. W., Goldsmith, R. E., & Pan, B. (2008). Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*, 29(3), 458–468.

- Loo, P. T., Boo, H. C., & Khoo-Lattimore, C. (2013). Profiling service failure and customer online complaint motives in the case of single failure and double deviation. *Journal of Hospitality Marketing & Management*, 22(7), 728–751.
- Loureiro, S. M. C., & Kastenholz, E. (2011). Corporate reputation, satisfaction, delight, and loyalty towards rural lodging units in Portugal. *International Journal of Hospitality Management*, 30(3), 575–583.
- Marchiori, E., & Cantoni, L. (2012). The online reputation construct: Does it matter for the tourism domain? A literature review on destinations' online reputation. *Information Technology & Tourism*, 13(3), 139–159.
- Mauri, A. G., & Minazzi, R. (2013). Web reviews influence on expectations and purchasing intentions of hotel potential customers. *International Journal of Hospitality Management*, 34, 99–107.
- Min, H., Lim, Y., & Magnini, V. P. (2015). Factors affecting customer satisfaction in responses to negative online hotel reviews: The impact of empathy, paraphrasing, and speed. *Cornell Hospitality Quarterly*, 56(1), 223–231.
- MKG. (2015). *Global hotel ranking 2015: A second Chinese operator climbs into the top 10*. [www.hospitality-on.com](http://www.hospitality-on.com) [October 25, 2015].
- Murphy, L., Mascardo, G., & Benckendorff, P. (2007). Exploring word-of-mouth influences on travel decisions: Friends and relatives vs. other travellers. *International Journal of Consumer Studies*, 31(5), 517–527.
- O'Connor, P. (2010). Managing a hotel's image on TripAdvisor. *Journal of Hospitality Marketing & Management*, 19(7), 754–772.
- O'Connor, P., & Frew, A. J. (2004). An evaluation methodology for hotel electronic channels of distribution. *International Journal of Hospitality Management*, 23(2), 179–199.
- Öğüt, H., & Onur Taş, B. K. (2012). The influence of Internet customer reviews on the online sales and prices in hotel industry. *The Service Industries Journal*, 32(2), 197–214.
- Park, S. Y., & Allen, J. P. (2013). Responding to online reviews: Problem solving and engagement in hotels. *Cornell Hospitality Quarterly*, 54(1), 64–73.
- Serra Cantallops, A. S., & Salvi, F. (2014). New consumer behavior: A review of research on eWOM and hotels. *International Journal of Hospitality Management*, 36, 41–51.
- Sparks, B. A., & Bradley, G. L. (2014). A "Triple A" typology of responding to negative consumer-generated online reviews. *Journal of Hospitality & Tourism Research*, Published online before print July 2.
- Sparks, B. A., & Browning, V. (2010). Complaining in cyberspace: The motives and forms of hotel guests' complaints online. *Journal of Hospitality Marketing & Management*, 19(7), 797–818.
- Tnooz. (2014). *Vast majority of TripAdvisor users read at least 6–12 reviews before choosing hotel*. Available at <http://www.tnooz.com/article/tripadvisor-online-review-insights-phocuswright-study/> (accessed 12.09.15).
- Tsao, W. C., Hsieh, M. T., Shih, L. W., & Lin, T. M. (2015). Compliance with eWOM: The influence of hotel reviews on booking intention from the perspective of consumer conformity. *International Journal of Hospitality Management*, 46, 99–111.
- Vásquez, C. (2014). *The discourse of online consumer reviews*. London: Bloomsbury.
- Vermeulen, I. E., & Seegers, D. (2009). Tried and tested: The impact of online hotel reviews on consumer consideration. *Tourism Management*, 30(1), 123–127.
- Xiang, Z., Schwartz, Z., & Uysal, M. (2015). What types of hotels make their guests (un) happy? Text analytics of customer experiences in online reviews. In *Information and Communication Technologies in Tourism 2015* (pp. 33–45). Springer International Publishing.
- Yacouel, N., & Fleischer, A. (2012). The role of cybermediaries in reputation building and price premiums in the online hotel market. *Journal of Travel Research*, 51(2), 219–226.
- Ye, Q., Law, R., & Gu, B. (2009). The impact of online user reviews on hotel room sales. *International Journal of Hospitality Management*, 28(1), 180–182.
- Zhang, Y., & Vásquez, C. (2014). Hotels' responses to online reviews: Managing consumer dissatisfaction. *Discourse, Context & Media*, 6, 54–64.



# Topic Detection: Identifying Relevant Topics in Tourism Reviews

Thomas Menner, Wolfram Höpken, Matthias Fuchs, and Maria Lexhagen

**Abstract** In the past few years, user generated content (UGC) has been taking an increasingly important role in tourism. Traveller's experiences and opinions about destinations and tourism services support potential customers in their booking decisions. Sentiments can be extracted automatically from UGC and be used as valuable input for managerial decisions. An important subtask of sentiment analysis is the task of topic detection, thus, identifying the topics or product features, like room, service, or food & drink in case of hotel reviews, the review is about. The paper presents an overall approach for extracting topics from touristic UGC, making use of different data mining techniques. The applied data mining techniques are compared and evaluated on the base of hotel reviews regarding the Swedish mountain tourism destination Åre.

**Keywords** Topic detection • Hotel review • User generated content • Data mining • Text mining

## 1 Introduction

The biggest consequence of the enormous increase of user generated content (UGC) in the tourism domain is the significant reduction of information asymmetries between tourism demand and supply. Until the appearance of review portals, like Holidaycheck.com or Booking.com, users mostly had to trust the different intermediaries and quality signals related to the travel and tourism services offered. Rating possibilities on the various review sites changed that situation dramatically in such a way that travellers can share experiences they made on their trips and destination stays online with other potential travellers. Since then, the transparency of the quality of tourism services, like hotels, restaurants, destinations, or whole trip offerings, has dramatically increased. Because of the fact that potential travellers

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have more faith in statements of other travellers than in commercials of tourism suppliers, this increased market transparency also has a strong impact on the booking process of customers and lastly on the booking decision (Sidali, Fuchs, & Spiller, 2012; Sparks, Perkins, & Buckley, 2013; Xiang & Gretzel, 2010). For example, a survey of the German institution Verband Internet Reisevertrieb has shown that in 2014 more than 80 % of prospective travellers stated their usage of social media portals during their booking processes, stressing UGC's still increasing relevance not only for potential customers but also for providers of tourism-related goods and services (Verband Internet Reisevertrieb e.V., 2014).

Even though the increased market transparency meant a radical change in the first place, the shared experiences, impressions and opinions of travellers are now representing a huge pool of potentially useful customer information for tourism and travel providers. Due to their public availability, user reviews can be extracted and processed automatically using different information retrieval, information extraction and data mining techniques, respectively. Thus, extracted and processed data from UGC can be utilised as valuable input for various strategic or operative business decisions. In this manner, next to the extraction of the sentiment or polarity of a specific user review, it is also possible to identify and extract the explicit topics mentioned in the review (Fuchs, Höpken, & Lexhagen, 2014; Höpken, Fuchs, Keil, & Lexhagen, 2015). The extracted topics, as result of the so called Topic Detection, can subsequently be used to improve the own services and offerings depending on whether the topics are mentioned positively or negatively.

Topic detection, as part of sentiment analysis, typically aims at identifying the topic of a review statement by assigning a predefined topic (by making use of supervised machine learning techniques). In contrast, topic detection methods presented in this paper aim at identifying unknown (and not predefined) topics mentioned within a review statement in an unsupervised manner. Thus, new topics, not recognized as relevant quality dimensions of tourism services so far, can be identified. Especially in tourism, characterized by complex services with lots of different quality dimensions, unsupervised topic detection turns out to be a promising approach to gain new insights into relevant quality dimensions as well as strengths and weaknesses of concrete tourism services along those quality dimensions.

In this paper several approaches for unsupervised topic detection are presented and compared to each other based on their levels of detection accuracy. Using different information retrieval, information extraction and data mining techniques, each proposed approach detects topics completely on its own, without learning specific topic words and non-topic words a-priori. The paper proposes a holistic process for extracting user reviews from rating portals, pre-processing them, mining them, and, finally, evaluating the performances of the different mining techniques. The paper is structured as follows: Sect. 2 describes the task of topic detection and the corresponding state of the art. Section 3 discusses the proposed methodology of topic detection for identifying relevant topics from UGC in the tourism domain. Section 4 presents evaluation results of employed data mining-based topic detection methods. Section 5 discusses implications of findings for

managerial usage. The final section is summing-up gained insights, discusses limitations and sketches future veins of related research.

## 2 Topic Detection and Related Work

The term Topic Detection often appears in the context of finding and following new topics/events in broadcast news stories, as mentioned firstly by Allan, Carbonell, Doddington, Yamron, and Yang (1998) as Topic Detection and Tracking (TDT). More precisely, within three tasks, new topics and events had to be found in an input news stream and known topics and events had to be tracked to inform about them. Topic Detection in the context of UGC, however, mostly appears along with the field of Sentiment Analysis. Also known as Feature Extraction, its focus is to extract all the features of a specific product a customer has rated. Accordingly, Bing Liu (2011) introduced the term feature-based Sentiment Analysis. The following briefly discussed studies are most closely related to this paper:

Hu and Liu (2004) developed an approach for mining and summarizing customer reviews which includes the extraction of features of products. Since product features are often represented by nouns, their approach extracts all the frequent nouns from the UGC in a first step. Subsequently, they match frequent nouns to the particular opinion words they are rated by. Finally, these combinations are used to identify infrequent features as well. In contrast, our paper only utilizes the fact that topics are typically represented by special parts of speeches (Wartena & Brussee, 2008). Thus, not only frequent nouns are extracted as topics, but also frequent verbs have been tested in the role as topic words.

Another related study is presented by Ziebarth, Malzahn, Zeini, and Hoppe (2008), which focuses on competence profile-creation in the IT sector through Keyword Clustering. For this purpose, job advertisements have been crawled from various online job portals and transformed into a term-document-matrix, based on TF-IDF values. As a next step, Ziebarth et al. performed a clustering on the term-document-matrix which is leading to different job profiles. Our paper similarly utilizes the fact that important words of a review represent also the major topics of that review.

Already in 1999, Panagiotis, Kehayov, and Manolopoulos (1999) implemented a Latent Semantic Indexing (LSI) approach to categorize documents by topic and by the easiness of readability through Single Value Decomposition based on the cosine similarity and a so called Aggregated Singular Value Decomposition. Contrary to Panagiotis et al. (1999), this paper presents an approach which employs Latent Semantic Indexing to categorize touristic documents into topics using a normal Singular Value Decomposition.

Schmunk, Höpken, Fuchs, and Lexhagen (2014) implemented a three-step sentence-based Sentiment Analysis. In a first step different property (i.e. topic) classes have been defined into which the different sentences were classified. In the course of the second step, the objective sentences were removed to keep only those

subjective sentences which contain a sentiment. The sentiment has finally been detected in the last step. In contrast, this paper focuses on the first step of most reliably identifying topics. More concretely, in contrast to Schmunk et al. (2014), no topic classes are pre-defined into which the different reviews are classified. Rather, the topic detection approaches applied in this paper detect topics in an unsupervised manner.

### **3 Methodology**

The methodology used to implement and evaluate the different topic detection approaches is represented by a holistic process consisting of the steps document retrieval, document extraction and selection, document pre-processing and mining, following the process presented by Hippner and Rentzmann (2006).

#### ***3.1 Document Retrieval***

Within the sub task of document retrieval, first of all, the review portals along with the specific hotels the test reviews will descend from have to be defined. For the test runs within the limits of this work, the social media portal TripAdvisor has been chosen as source of the reviews. More concretely, the reviews themselves come from two hotels in the Swedish mountain tourism destination Åre. To retrieve them from the TripAdvisor website, a web crawling is necessary, which searches for and fetches all html pages containing user reviews based on specific regular expressions. Overall, the web crawler retrieved 124 user reviews, consisting of over 1200 single review statements (i.e. sentences).

#### ***3.2 Document Extraction***

After the sub task of document retrieval the reviews itself are still embedded within the retrieved HTML documents. Thus, there still exist HTML elements, like tags, footers or headers, which falsify the review texts. Thus, in a next step, the explicit textual reviews are extracted from the html pages fetched by the web crawler. This is realized by using regular expressions again in combination with XPath expressions. While the use of XPath enables the direct addressing and extracting of the HTML parts with the explicit user reviews, the appliance of regular expressions, finally, clears up the review text from remaining HTML tags. The resulting reviews are free texts, consisting of several sentences without any further structure. The text length varies from one-sentence-reviews to long travel diaries.

### 3.3 Document Processing

In a next step, the textual user reviews are further pre-processed. In this task, each review is specifically prepared for each of the various data mining techniques. Because of the diversity of the approaches the input datasets for the mining task have to match the specific requirements and individual settings of every single approach. That is why the retrieved reviews have to be pre-processed differently. Specific pre-processing steps, for example, are splitting full reviews into single statements, or in our case sentences, by regular expressions based on punctuations, like points, question marks or exclamation marks, or by splitting sentences into single words. Further pre-processing steps are tokenisation, filtering of stop-words, stemming and the transformation to lower cases. Full reviews or single sentences are finally transformed into a so called ‘term document matrix’, based on term occurrences, term frequency or TF-IDF (term frequency—invers document frequency) values.

### 3.4 Mining

Based on the appropriately pre-processed user reviews, the mining task performs the different data mining techniques for topic detection. The approaches presented in this paper can be divided into the two machine learning branches of unsupervised learning and supervised learning (Cleve & Lämmel, 2014).

#### 3.4.1 Unsupervised Learning

Unsupervised learning techniques, or algorithms, try to find interesting facts or patterns within the input data completely on its own without learning the context and the correlations based on training data (Cleve & Lämmel, 2014). The following unsupervised learning approaches for topic detection were developed and tested in the course of this study:

*Identification of Frequent Nouns and Verbs* This approach is a very simple technique to detect topics within a user review. Basis of the approach is the assumption, that the nouns and verbs occurring frequently within user reviews often represent the topics discussed in user reviews. The reason for this is the similar vocabulary the customers use to talk about the same products or services. Nouns or verbs which are used to describe the same thing are almost certainly more frequent than the remaining words of the reviews which have a much greater variance. Thus, this approach simply detects nouns and/or verbs based on Part-of-Speech (POS) tagging (making use of the PENN-database), and extracts all frequent words above a specific threshold. The extracted words, finally, represent the most important topics of the underlying user reviews. In order to find out the most accurate approach for

the identification of topics, frequent nouns, frequent verbs, and frequent nouns and verbs have been tested.

*Keyword Clustering* As a second unsupervised learning approach Keyword Clustering (Müller & Lenz, 2013) has been implemented. For this clustering approach, a term document matrix with the TF-IDF weighted review words represents the basis of the k-Means clustering algorithm, which was used with the cosine similarity as distance measure as recommended by the text mining literature (Müller & Lenz, 2013). Words with high TF-IDF values within a cluster then represent words often co-occurring in reviews and, thus, represent latent topics. The following settings and parameters were tested:

- Clustering with  $k = 40$  and  $k = 80$
- Clustering on sentences and on whole Feedbacks
- Clustering all words
- Clustering only substantives
- Clustering only verbs
- Clustering substantives and verbs

*Latent Semantic Indexing* Latent Semantic Indexing (LSI) is the third unsupervised learning approach which was tested in this paper. Together with the Principal Components Analysis and the Projection Pursuit it represents a suitable technique to reduce the dimensions of a vector space with a minimal loss of information. More concretely, the primary goal of LSI is to reduce the variety of words within a text, utilising the fact that usually there exists more than one word for describing the same object (e.g. a hotel room). Based on a TF-IDF weighted term document matrix and by using the statistical approach of Singular Value Decomposition, LSI summarises all words with a similar context into a so called concept. Such a concept then represents the (latent) semantic of all those words which, finally, also represent a latent topic as defined by the Topic Detection approach (Deerwester, Dumais, & Harshman, 1990; Dumais, Furnas, & Landauer, 1988; Miner et al., 2012). Similarly to the previous Keyword Clustering, the settings and parameters for testing possible effects on the accuracy were as follows:

- LSI with  $k = 40$  and  $k = 80$
- LSI on sentences and on whole Feedbacks
- LSI on all words
- LSI only on substantives
- LSI only on verbs
- LSI on substantives and verbs together

### 3.4.2 Supervised Learning

Unlike unsupervised learning, Supervised Learning approaches and techniques require training datasets, including manually pre-classified records, used as basis for learning a model to classify new and unclassified data records later on (Cleve & Lämmel, 2014). For this study, the Supervised Learning approach Named Entity Recognition was tested. The details of this approach are described next:

*Named Entity Recognition* The Named Entity Recognition (NER) is settled in the field of Information Extraction and helps the user to structure a text in a way that relevant information in the form of entities can be extracted more easily (Miner et al., 2012). Depending on the text and the goals, entities are typically words which, for example, represent persons, organisations or locations. In this study, the original NER approach is modified in a way that only two pseudo entities are used to declare a specific word as a topic (entity = Topic) or a non-topic (entity = O). Thus, in order to extract them, in the step of pre-classification every single word in the input dataset has to be manually classified as topic or non-topic. Subsequently, the pre-classified records have to be enriched with linguistic and/or grammatical content, like the surrounding words of a specific word within a sentence, or the part of speech of a specific word, and each word and its context is represented as a separate data record. Table 1 shows an example for an enriched and pre-classified dataset.

After this kind of pre-classification, each supervised learning algorithm can be used to learn a model based on the pre-classified words. In order to avoid the algorithm to just re-identify the words which have been labelled as topics within the training data, the algorithm has been tested without the “Word” itself. Accordingly, the model will be learned only on the basis of the sentence structure in form of the ‘n’ surrounding words of a specific topic or non-topic word. For the test runs of this study the following settings, parameters and algorithms were finally tested:

- 2, 3, 4 and 5 words before and after a specific word
- Naïve Bayes
- K-Nearest-Neighbour with k = 5, 10, 15, 20, 25 and 50
- Support Vector Machines
- Sequential Mining based on Conditional Random Fields

**Table 1** Example for an enriched and pre-classified dataset

ID	Word_before	Word	Word_after	Label
1	Skiing	This	Is	O
1	This	Is	A	O
1	Is	A	Lovely	O
1	A	Lovely	Place	O
1	Lovely	Place		Topic
1	Place		To	O

## 4 Evaluation Results

For the purpose of evaluation, the discussed approaches were executed with all the proposed settings and parameters presented above. Test results in the form of accuracy level, recall and precision are recorded within a confusion matrix (Liu, 2011). Those settings and parameter combinations which performed best were identified for each approach and compared with the best results of the other approaches. The following list shows the best settings and parameters for each of the four test cases:

- *Identification of frequent words*: Identification of frequent nouns
- *Keyword Clustering*: Clustering substantives based on sentences with  $k = 80$
- *LSI*: LSI on substantives based on sentences with  $k = 80$
- *NER*: Naïve Bayes with two words before and after the word to be classified

The exact test results these specific approaches reached are shown by Table 2. Based on these test results, the best approaches for detecting relevant topics in tourism reviews can be identified as discussed next.

Keyword Clustering with an accuracy value of 88.45 % turned out to be the best approach for Topic Detection. Similarly, the approach of the identification of frequent words and the LSI approach reached a respectable accuracy value of over 80 %. With 75.17 % the NER approach is the only one which fell behind noticeably. But if the recall and precision values of the single approaches are included in the evaluation procedure, a different picture emerges.

Beginning with the approach of identifying frequent words, the 82.86 % accuracy is highly affected by the bad quality at detecting topics. Even though 94.20 % of the manually pre-classified topics could be redetected by the approach, the precision level of detecting these topics was only at 53.19 %. This means that only slightly more than half of the words which have been declared as a topic by the approach, afterwards actually were topics. This implies that the approach declared a word as a topic way too often because not every substantive is a topic at the same time. On the other hand the detection of non-topic words performed pretty solidly which can be constituted by the high 80.14 % recall with almost no misclassifications. Anyway, considering the task of detecting topics the approach of identifying frequent words turned out to be not appropriate to solve this task properly.

**Table 2** Evaluation of the tested approaches

Approach	Accuracy	Recall topic	Recall No topic	Precision topic	Precision no topic
Identification of frequent words	82.86 %	94.20 %	80.14 %	53.19 %	98.29 %
Keyword clustering	88.45 %	62.84 %	94.59 %	73.56 %	91.40 %
LSI	85.46 %	48.95 %	94.21 %	66.96 %	88.51 %
NER	75.17 %	77.94 %	72.39 %	73.84 %	76.65 %



Keyword Clustering reached the highest overall level of accuracy. However, an issue which attracts attention is again the low topic recall value of 62.84 %. Even the recall and precision values of over 90 % in detecting non-topic words and the acceptable topic precision of 73.56 % cannot compensate this low redetection of pre-classifications which is why the approach cannot be recommended for Topic Detection in a tourism context.

An even lower topic recall was reached by the approach of LSI during the test run. With 48.95 % the LSI could not even redetect half of the manually pre-classified topic words, which means that the high overall accuracy of 85.46 % stems from the relatively high non-topic detection rates but doesn't represent the quality in the context of Topic Detection in tourism. Thus, the Latent Semantic Indexing approach can neither be recommended for this task.

In contrast to the previous three approaches, the overall accuracy of the last approach in the form of the Named Entity Recognition is the only one with a value under 80 % and therefore not the most promising at first glance. However, NER could not only reach the most balanced result of all tested approaches, but also a quite useful result in terms of Topic Detection. Although the Topic Recall of 77.94 % isn't that high like the Topic Recall of identifying frequent words, there still could be redetected nearly 80 % of the pre-classified topics with NER. Moreover, the precision of the NER topic detection approach doesn't drop like the precision of the frequent words approach which, thus, proves a much higher quality of the NER topic detection. More precisely, if a word will be declared as a topic, in more than 76 % of the cases the word is in fact a topic. In addition to these relatively high topic detection rates, the detection of non-topics based on NER also could reach proper and balanced rates, which is a further reason why the Named Entity Recognition can be declared as the best performing approach for Topic Detection.

To prove the fact, that new topics, which have not been labelled as topics within the training data, can be identified by the NER approach, a simple additional test has been performed. First of all, six high frequent topic words were assigned and all the sentences inside the training data which include one of these assigned topics were extracted from the training dataset. Afterwards, the model was learned on the remaining training data and, thus, the algorithm didn't know about the existence of the extracted topics. To check if the model can detect the extracted topics despite not knowing them, the learned model was applied to a test dataset only composed of sentences which include the extracted topic words. Of the 362 topic words the model could redetect a number of 302 topics. This means not only an even higher topic recall of 83.43 % compared to the recall of Table 4, but also is a further proof of the approach's independence of explicit topic words and, thus, its ability to identify new and unknown topics, similar to the other approaches.

## 5 Usage

Now, that the various approaches have been tested and the best performing approach for Topic Detection in the form of the Named Entity Recognition has been identified, the gained knowledge and the learned model can be used for mining UGC in the tourism domain. It is necessary, however, that those texts which should be mined first will be processed like it is explained in Sects. 3.3 and 3.4, respectively. It is then possible to extract topics with a success rate of about 77 %. Although the approach still leads to a certain rate of misclassifications, for detecting at least all of the relevant topics the approach is more satisfying and, therefore, an effective way to get an idea of what the customers are talking about. For a better imagination Tables 3 and 4 are representing particularly the five most popular topics which the NER approach has detected within reviews regarding the Åre hotels ‘Copperhill Mountain Lodge’ and ‘Holiday Club Åre’.

Tables 3 and 4 clearly show that *hotel*, *room*, *ski* and *spa/pool/sauna* are the most important and most often mentioned topics within the analysed online reviews for both hotels in Åre. However, the topics *hotel* and *staff* seem to be much more important for guests of Copperhill Mountain Lodge than for those of Holiday Club Åre, reflecting a different guest perception of the two hotels. These findings correspond to the different profiles of the two hotels, with Copperhill Mountain Lodge being a five-star hotel, well known for its exceptional hotel architecture and design.

However, it is important to note that the Topic Detection, as one subtask of sentiment analysis, actually only detects topics mentioned within user reviews and not the sentiment of the statement. For this purpose, a consecutive sentiment detection is necessary, as mentioned before. For this purpose, it is recommended to combine the NER approach with the sentence-based Sentiment Analysis approaches presented by Schmunk et al. (2014). By the use of this combination, for example, a hotelier receives a powerful tool not only to get a constant

**Table 3** Five most popular topics of Copperhill Mountain Lodge

Identified topics	Total occurrences
Hotel	143
Room	84
Ski	63
Spa	41
Staff	38

**Table 4** Five most popular topics of Holiday Club Åre

Identified topics	Total occurrences
Room	80
Hotel	62
Pool	44
Ski	39
Sauna	28

transparency about the topics the customers are talking about in their reviews, but also about the customer's opinions and experiences in connection with the own hotel. Thus, it is possible to recognize positive as well as negative trends faster than without the knowledge gained from UGC.

Furthermore it is not only possible to get a better insight into the own business, but also to get a certain insight into the competitors' businesses because of the public availability of UGC. This allows a continuous comparison between the own organisation and the other market players which helps to see and understand the own market position more clearly. In the same way, it is also possible to recognize other hotels with similar topical patterns representing potential strategic cooperation partners. For example, those partnerships could permit joint marketing initiatives, collaborations in various product offerings or an easier handling in the case of overbookings. Other important tourism stakeholders who also could take advantage of the publicly available UGC are destination managers. They can continuously monitor the popularity of the different services within their destination and can directly address those, which are beyond a specific threshold to keep the destination on top.

## 6 Summary and Outlook

With an accuracy of 77.94 % (and a topic recall of 77.94 % and a topic precision of 73.84 %) the majority of the relevant topics can be successfully detected by the Named Entity Recognition (NER) approach developed and tested in this study. All data mining processes have been implemented by the data mining tool RapidMiner Studio<sup>®</sup>. Although this finding is thoroughly useful for tourism practice, there is still room for further improvement through additional research efforts. More precisely, predefined operators for procedures, like Topic Modelling (Blei & Lafferty, 2009) or Dependency Parsing (Wu, Zhang, Huang, & Wu, 2009), have not been available during the study. Similarly, there was no possibility to simultaneously implement a Topic Detection-approach with an integrated Sentiment Analysis so that a specific topic can be immediately connected to the opinion word which is rating the topic. A so called feature-based Sentiment Analysis would solve the problem of the sentence-based Sentiment Analysis, that a sentence could include more than one topic which, however, makes it difficult to correctly match topics and opinion words within the same sentence (Liu, 2011). Thus, the implementation of a feature-based Sentiment Analysis with a directly integrated Topic Detection will be a next promising step for an extended Sentiment Analysis approach.

## References

- Allan, J., Carbonell, J. G., Doddington, G., Yamron, J., & Yang, Y. (1998). **Topic detection and tracking pilot study final report**. *Proceedings of the Broadcast News Transcription and Understanding Workshop* (pp. 194–218).
- Blei, D., & Lafferty, J. (2009). Topic models. In A. Srivastava & M. Sahami (Eds.), *Text mining—Classification, clustering, and application*. Boca Raton: CRC Press.
- Cleve, J., & Lämmel, U. (2014). *Data mining*. München: Oldenbourg Wissenschafts-verlag.
- Deerwester, S., Dumais, S., & Harshman, R. (1990). Indexing by latent semantic analysis. *Journal of the American Society for Information Science*, 41(6), 391–407.
- Dumais, S., Furnas, G., & Landauer, T. (1988). Using latent semantic analysis to improve access to textual information. In J. O'Hare (Ed.), *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. New York: ACM.
- Fuchs, M., Höpken, W., & Lexhagen, M. (2014). Big data analytics for knowledge generation in tourism destinations: A case from Sweden. *Journal of Destination Marketing and Management*, 3(4), 198–209.
- Hippner, H., & Rentzmann, R. (2006). *Text mining*. Ingolstadt: Springer.
- Höpken, W., Fuchs, M., Keil, D., & Lexhagen, M. (2015). Business intelligence for cross-process knowledge extraction at tourism destination. *Journal of Information Technology and Tourism*, 15(2), 101–130.
- Hu, M., & Liu, B. (2004). Mining and summarizing customer reviews. In W. Kim et al. (Eds.), *Proceedings of the tenth ACM SIGKDD international conference on Knowledge discovery and data mining*. New York: ACM.
- Liu, B. (2011). *Web data mining: Exploring hyperlinks, contents and usage data* (2nd ed.). Chicago: Springer.
- Miner, G., Delen, D., Elder, J., Fast, A., Hill, T., & Nisbet, R. A. (2012). *Practical text mining—A business applications approach*. Upper Saddle River: Pearson Prentice Hall.
- Müller, R. M., & Lenz, H.-J. (2013). *Business intelligence*. Berlin, Heidelberg: Springer.
- Panagiotis, S., Kehayov, I., & Manolopoulos, Y. (1999). Text classification by aggregation of SVD Eigenvectors. In J. Eder, I. Rozman, & T. Welzer (Eds.), *Advances in databases and information systems: Third East European Conference, ADBIS '99 Maribor, Slovenia, September 1999*. Berlin: Springer.
- Schmunk, S., Höpken, W., Fuchs, M., & Lexhagen, M. (2014). Sentiment analysis: Extracting decision-relevant knowledge from UGC. In P. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 253–265). New York: Springer.
- Sidali, K. L., Fuchs, M., & Spiller, A. (2012). The effect of electronic reviews on consumer behavior—An explorative study. In M. Sigala, U. Gretzel, & R. Vangelis (Eds.), *Web 2.0 in travel, tourism and hospitality: Theory, practices and cases* (pp. 239–253). Surrey: Ashgate Publishing.
- Sparks, B., Perkins, H., & Buckley, R. (2013). Online travel reviews as persuasive communication: The effects of content type, source and certification logos on consumers behavior. *Tourism Management*, 39, 1–19.
- Verband Internet Reisevertrieb e.V. (2014). *Daten & Fakten zum Online-Reisemarkt*. <http://www.v-i-r.de/vir-datenfakten-onlinereisemarkt-2014.html>. [Sept. 14, 2015].
- Wartena, C., & Brussee, R. (2008). Topic detection by clustering keywords. In A. M. Tjoa & R. R. Wagner (Eds.), *Nineteenth International Workshop on Database and Expert Systems Applications*. IEEE Computer Society: Los Alamitos.
- Wu, Y., Zhang, Q., Huang, X., & Wu, L. (2009). Phrase dependency parsing for opinion mining. In P. Koehn & R. Mihalcea (Eds.), *Proceedings of the 2009 Conference on Empirical Methods in Natural Language Processing* (pp. 1533–1541). Stroudsburg: ACL.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179–188.

Ziebarth, S., Malzahn, N., Zeini, S., & Hoppe, H. U. (2008). Ein empirischer Zugang zur Ermittlung von Kompetenzprofilen in der Digitalen Wirtschaft. In K. Meißner & M. Engelen (Eds.), *Virtuelle Organisationen und Neue Medien 2008 (GeNeMe 2008)*. Dresden: COLLIDE.

**Part IV**  
**Mobile Systems and Pervasive**  
**Communication**

# Investigating American iPhone Users' Intentions to Use NFC Mobile Payments in Hotels

Cristian Morosan and Agnes DeFranco

**Abstract** Recently, a series of events (e.g., Near Field Communication (NFC) hardware becoming mainstream, the deadline given to merchants to accept EMV (chip-based) cards) precipitated the development of an infrastructure that increasingly accommodates NFC mobile payments (NFC-MP) in the U.S. Within the landscape of the American NFC-MP, an important role is occupied by the Apple NFC-MP ecosystem. Drawing from the neo-classic technology adoption and regulatory focus theory, this study developed a conceptual model that explicates iPhone users' intentions to use NFC-MP in hotels. Using data collected from a sample of 347 U.S. iPhone users, the model was validated empirically, providing a mapping of the factors that influence intentions to use NFC-MP in hotels. The study validated hedonic motivation and performance expectancy as the most critical predictors of intentions, and recognized the more modest roles of privacy concerns and prevention focus in influencing intentions.

**Keywords** Mobile payments • Technology adoption • Regulatory focus • Privacy • Hotels

## 1 Introduction

A series of recent developments in technology and business models facilitated an acute interest of American consumers in mobile payments (MP). Specifically, the popularity of the iPhone and its massive commercial ecosystem, the commercialization of near field communication (NFC)-enabled devices (e.g., iPhone6, Apple Watch), and the October 2015 deadline given by the major credit card companies to American merchants to accept chip-based cards, facilitated an unprecedented focus on NFC (i.e., contactless) mobile payments (NFC-MP). NFC-MP represent methods of payment that use NFC-enabled mobile devices/apps that exchange information with NFC-enabled payment terminals when the mobile devices are placed in the proximity of the terminals and users authenticate and approve

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transactions (Kassner, 2014). NFC-MP use a new version of payment protocols that are more secure than their rivals (Apple, 2015) and offer benefits to both users (e.g., transferring the payment task to the smartphone, secure transactions, the convenience of not carrying an actual card/wallet) and merchants (e.g., secure transactions, lower audit risk). While mobile devices have been used for a while in the American e-commerce as web-based devices, at the time of this study the development of the NFC-MP in the U.S. can only be described as incipient. Despite such early developmental stages, the list of American merchants accepting NFC-MP is growing. However, the consumer NFC-MP tools can be grouped according to only a very few ecosystems. Among them, the Apple NFC-MP ecosystem, consisting of hardware (e.g., iPhone6, iPhone5 + AppleWatch, certain iPads), software (e.g., Apple Pay) and the corresponding B2B business models, represents to date arguably the most popular NFC-MP ecosystem (Hof, 2015). Its popularity is attributable to: (1) its launch before the expenditures of the 2014 holiday season (Heun, 2015), (2) its ability to enlist approximately 750 banks and credit unions during the first 4 months of commercialization (Heun, 2015) and to secure the trust of significant merchants (e.g., Panera Bread, Whole Foods), but most importantly, (3) to its large parent Apple-IOS ecosystem (Apple, 2015) and the recent sale of 74 million iPhone6/6 s (Heun, 2015). At the end of January 2015, approximately 66 % of the NFC-MP transactions were conducted via the Apple NFC-MP ecosystem (Hof, 2015).

Poised to consolidate its leadership position, the Apple NFC-MP ecosystem offers unique opportunities to study several facets of technology adoption that could not be addressed before, thus leaving important lacunae in the current body of knowledge. First, while scholars investigated the determinants of web-based payments using mobile devices in generic settings (e.g., Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014), no research to date documents the factors leading to intentions to use MP in hotels. Second, while system performance is recognized as a main driver of adoption (Venkatesh & Bala, 2008), its conceptualizations have captured the task environment too generically, thus being unable to offer insight into specific system attributes that facilitate task completion (Benbasat & Barki, 2007). Third, while abundant research has focused on a variety of system beliefs, recently numerous scholars called for the inclusion of consumer characteristics within conceptual models (Aluri & Palkurthi, 2011). Fourth, there is no academic research addressing consumers' privacy concerns regarding NFC-MP, which are characterized by unique security challenges (e.g., tokenization mechanisms, device account number (DAN) storage, mobile terminal authentication) (Kassner, 2014).

Such lacunae, corroborated with the lack of a systematic examination of critical hotel industry factors that influence technology adoption (e.g., high transaction fragmentation; ownership/management style fragmentation; transient, extensive, and public nature of consumption while on the property, slow/uneven technology deployment) (Law, Leung, Au, & Lee, 2013), offer an unprecedented opportunity to examine iPhone users' intentions to use NFC-MP when staying in hotels. Accordingly, obtaining such insight in an area that is likely to dominate every



aspect of global tourism retail is critical to all stakeholders, especially to academics (by building a solid body of knowledge explaining MP behavior), technology developers (by improving design), and industry decision-makers (by envisioning novel business models that engage consumers into new experiences to increase value) (Gebauer, Johnson, & Enquist, 2010). Therefore, drawing from the neo-classic technology adoption (e.g., Venkatesh, Thong, & Xu, 2012) and regulatory focus theory (Higgins, 1997), this study's main objective is to build and validate empirically a conceptual model that explicates iPhone users' intentions to use NFC-MP in hotels based on system perceptions and consumer characteristics that uniquely reflect the hotel NFC-MP context. The following sections outline the conceptual model development, followed by hypotheses. The methodology section describes how data were collected and analyzed, followed by discussions and implications for academia and managers.

## 2 Review of Literature and Model Development

Most empirical studies explaining technology adoption have been grounded in theories that linked users' system perceptions to their behavioral outcomes (i.e., intentions, actual behavior). Eventually, such theories became popular due to their ease of conceptualization and their strong empirical support (Benbasat & Barki, 2007). However, they were criticized for being too parsimonious (Benbasat & Barki, 2007), rooted too deeply in system perceptions (Bagozzi, 2007), yet unable to fully capture specific task environments (Benbasat & Barki, 2007). As a result, the theory transcended from classic [e.g., Technology Acceptance Model (Davis, 1989)] to neo-classic [e.g., Unified Theory of Adoption and Use of Technology (Venkatesh et al., 2012)]. While the theory constantly evolved, the neo-classic theory retained the fundamental artifacts that explain adoption—system performance and effort perceptions—thus remaining true to the thesis that the basic ability of a system to allow users to perform tasks efficiently and effortlessly facilitates adoption. Most of today's empirical research augmented this neo-classic theoretical base by adding constructs that best depict specific adoption contexts, resulting in models reflecting an amalgamation of additional system perceptions [e.g., hedonic motivation (Venkatesh et al., 2012), security (Shin, 2009)] and consumer-related characteristics [e.g., innovativeness (Hirunyawipada & Paswan, 2006)] that better describe the consumer-task dyad (Baptista & Oliveira, 2015). Recognizing the validity of such approaches, this study develops a conceptual model based on the two fundamental system perceptions (i.e., performance and effort expectancy) (Venkatesh et al., 2012), to which it adds constructs that are borrowed from neo-classic adoption theory [i.e., hedonic motivation (Venkatesh et al., 2012), privacy concerns (Eastlick, Lotz, & Warrington, 2006)] and regulatory focus theory (i.e., promotion and prevention foci) (Higgins, 1997).

Performance expectancy reflects a user's evaluation of a system's ability to facilitate the completion of a task (Venkatesh et al., 2012). As a fundamental

theoretical artifact, it has been validated in many contexts as a strong antecedent of adoption behavior (Morosan, 2014). In a hotel context, the ability of a consumer to perform a payment via NFC-MP is strongly dependent on the MP system's performance, with direct implications for adoption. While such systems were designed to offer consumers superior levels of control over the management of payments, NFC-MP can indeed be characterized by performance. In contrast, effort expectancy reflects a user's evaluation of the effort necessary to complete a task using a system (Venkatesh et al., 2012). While most research pointed to significant relationships between effort expectancy and behavioral outcomes (e.g., Dwivedi, Shareef, Simintiras, Lal, & Weerakkody, 2015), several studies could not validate such relationships (Baptista & Oliveira, 2015). However, as the general Apple NFC-MP ecosystem is geared toward minimal effort and an intuitive consumer interface that facilitate use, a positive relationship is expected to exist between hotel consumers' NFC-MP effort expectancy and their intentions to use such systems. Thus, the following hypotheses were developed.

*H1* There is a positive relationship between consumers' performance expectancy and their intentions to use NFC-MP in hotels.

*H2* There is a positive relationship between consumers' effort expectancy and their intentions to use NFC-MP in hotels.

Hedonic motivation reflects the entertainment value of using a system (Venkatesh et al., 2012). Initially utilized as an extension to the core models in earlier adoption theory (Morosan & Jeong, 2008), hedonic motivation was recently added as a central construct in the neo-classic theory (Venkatesh et al., 2012), as system designers and marketers began recognizing the need of systems to address non-utilitarian tasks (Dwivedi et al., 2015). Undoubtedly, hedonic motivation was found to influence consumers' intentions to use systems (Venkatesh et al., 2012). A main attribute of the entire Apple ecosystem, which reflects on the NFC-MP as well, is its hedonic value (Furió, González-Gancedo, Juan, Seguí, & Rando, 2013). That is, the size and diversity of the entire ecosystem (e.g., over 1.2 Million apps, 75 Billion downloads) (Perez, 2014) supports its ability to address consumers' hedonic needs. Accordingly, the following hypothesis was developed.

*H3* There is a positive relationship between consumers' hedonic motivation and their intentions to use NFC-MP in hotels.

Privacy concerns regarding a system reflect users' perceptions of the system's ability to safeguard their privacy (Kim, Brewer, & Bernhard, 2008). Generally, privacy concerns have a negative influence on intentions to use systems (Li, Sarathy, & Xu, 2011). As all payment systems are inherently characterized by risk, the privacy concerns associated with compromising critical payment information and the corresponding biographic information should influence consumers to revise their behaviors vis-à-vis such systems. Moreover, the risk associated with NFC-MP may be more acute in hotels due to the high transactional fragmentation and system novelty. Accordingly, the following hypothesis was developed.

*H4* There is a negative relationship between consumers' privacy concerns regarding NFC-MP and their intentions to use NFC-MP in hotels.

The regulatory focus theory suggests that individuals can develop two motivational orientations: promotion and prevention (Higgins, 1997). That is, promotion-focused individuals emphasize achievement and focus on the presence/absence of positive outcomes, while prevention-focused ones emphasize safety and responsibility and focus on the presence/absence of negative outcomes (Lee & Koo, 2012). Such theoretical underpinnings have opened new directions for explaining individual behavior (Zhao & Pechmann, 2007), including in information systems (Lee & Koo, 2012), as users' development of system perceptions could be better explained by using factors that may have a nuanced influence on such perceptions (Jia, Wang, Ge, Shi, & Yao, 2012). Specifically, it was suggested that both promotion and prevention foci are instrumental in obtaining outcomes from risky behaviors (e.g., entrepreneurial success in Brockner, Higgins, and Low (2004); use of self-service technology in Jia et al. (2012)), which is performed according to underlying motives, nature of goals/standards, and the nature of expected outcomes (Brockner et al., 2004). Therefore, both the promotion and prevention foci of hotel consumers should influence their intentions to use NFC-MP in hotels, as both foci facilitate consumers' subjective interpretations of the same task (Higgins, 1997). Moreover, as promotion focus stimulates consumers to better recognize durability and feasibility in commercial contexts, promotion-focused iPhone users may holistically evaluate the NFC-MP systems in hotels as feasible, thus influencing preventive aspects of consumption (e.g., safety). Therefore, the following hypotheses were developed.

*H5* There is a positive relationship between consumers' regulatory promotion focus and their intentions to use NFC-MP in hotels.

*H6* There is a positive relationship between consumers' regulatory prevention focus and their intentions to use NFC-MP in hotels.

*H7* There is a positive relationship between consumers' regulatory promotion focus and their regulatory prevention focus.

### 3 Methodology

Data were collected using a survey instrument, developed upon a rigorous literature review. The scales for performance expectancy (14 items), effort expectancy (4 items), and hedonic motivation (4 items), and intentions (4 items), were adapted from the work of Venkatesh et al. (2012). Notably, the scale for performance expectancy was augmented from four to fourteen items to better tap into the core construct, thus addressing the criticism regarding the conceptualization of system perceptions (Benbasat & Barki, 2007). Privacy concerns included three items, adapted from Kim et al. (2008), while the two regulatory focus constructs were

measured using two three-item scales adapted from Higgins (1997). All scale items were measured using Likert-type scales (1 = strongly disagree; 5 = strongly agree). The survey concluded with behavioral and demographic sections. The survey was launched in April 2015 after rigorous pilot testing. The sample—derived from the general U.S. population—was obtained using the services of a consumer panel firm. An invitation to participate in the survey was sent to 25,356 consumers. Three filtering questions facilitated the retention of qualified respondents, by asking respondents (1) if they stayed in a hotel within the 12 months prior to the study, (2) if they had a smartphone, and (3) what smartphone model they primarily used. A total of 347 iPhone users were retained. This response rate called for an analysis of potential non-response bias, which was assessed by comparing early with late respondents (Ary, Jacobs, & Razavieh, 1996). As no significant differences were revealed between the early and late respondents, it was concluded that non-response bias was not a problem in this sample.

## 4 Results and Discussion

Several basic analyses facilitated the demographic/behavioral characterization of the sample (Tables 1 and 2). Most respondents were male, relatively equally split between income categories, with a higher education degree, and with incomes of

**Table 1** Demographic characteristics

Characteristic	Percentage
Gender	
Male	47.8
Female	52.2
Age	
24 or younger	15.3
25–29	7.2
30–39	19.9
40–49	23.6
50–59	15.3
60 or older	18.7
Education	
High School Degree or equivalent	23.6
Bachelor of Science/Arts or equivalent	51.3
Graduate degree (MS, PhD, Law, Med.)	20.8
Other	4.3
Annual household income	
\$50,000 or less	22.8
\$50,001–\$ 100,000	40.1
\$100,001–\$ 150,000	24.8
\$150,001–\$200,000	6.9
\$200,001 or more	5.5

**Table 2** Behavioral characteristics

Characteristic	Percentage
<b>Hotel stay frequency</b>	
Less than once a year	2.0
1–2 times a year	31.1
3–6 times a year	24.5
7–12 times a year	22.2
More than 12 times a year	20.2
<b>Typical length of stay</b>	
1 night	8.4
2–3 nights	56.8
4–7 nights	30.0
8–14 nights	4.3
More than 14 nights	0.5
<b>Typical purpose of travel</b>	
Exclusively business	2.3
Mostly business	10.4
Combined business and leisure	21.3
Mostly leisure	30.8
Exclusively leisure	35.2

\$50,000 or more. The sample showed a predominant leisurely travel character, with most respondents staying in hotels 1–2 times a year, for 2–3 nights, mostly for leisure.

The psychometric properties of the instrument were tested using a confirmatory factor analysis, conducted using Mplus v.5 (Muthén & Muthén, 2007) (Tables 3 and 4). Since the data set did not conform to a multivariate normal distribution (although univariate normality was established), the analysis used estimators that were robust to violations of multivariate normality (Muthén & Muthén, 2007). One of the items originally used to measure promotion focus had a low loading and was removed and the model was respecified. The model had a  $X^2 = 897.435$  and d. f. = 504 (normed  $X^2 = 1.78$ ), a Comparative Fit Index (CFI) of 0.96, a Tucker Lewis Index (TLI) of 0.96, and a Root Mean Square Error of Approximation (RMSEA) of 0.047, all indicating good fit (Toh, Lee, & Hu, 2006).

The model was then subjected to reliability and validity analyses. The construct composite reliabilities (CCR) were higher than 0.8, indicating appropriate reliability of all latent constructs (Hair, Black, Babin, & Anderson, 2009). Convergent validity was assessed using the factor loadings, which were higher than 0.7 (except for one, which was within one percent of 0.7) and significant (Hair et al., 2009). Moreover, the squared multiple correlations were higher than 0.4, while the average variance extracted (AVE) from each latent construct was higher than 0.5, thus indicating appropriate convergent validity. In addition, the AVE values were higher than the corresponding inter-construct correlations (except for two values), indicating good discriminant validity (Fornell & Larcker, 1981).

**Table 3** Reliability and validity testing results

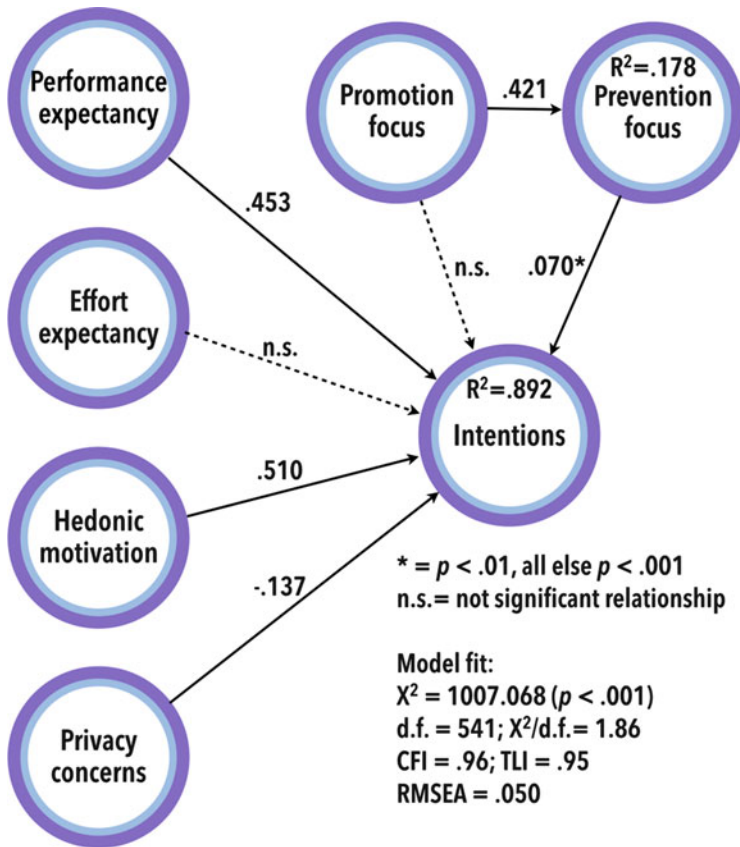
Constructs	Items	Loadings	SMC	AVE	CCR
Performance expectancy	1	0.862	0.743	0.706	0.791
	2	0.846	0.716		
	3	0.832	0.692		
	4	0.829	0.687		
	5	0.867	0.752		
	6	0.857	0.734		
	7	0.867	0.752		
	8	0.869	0.755		
	9	0.827	0.684		
	10	0.834	0.696		
	11	0.741	0.549		
	12	0.812	0.659		
	13	0.827	0.684		
	14	0.886	0.785		
Effort expectancy	1	0.848	0.719	0.739	0.919
	2	0.855	0.731		
	3	0.857	0.734		
	4	0.879	0.773		
Hedonic motivation	1	0.939	0.882	0.798	0.950
	2	0.920	0.846		
	3	0.882	0.778		
	4	0.893	0.797		
Privacy concerns	1	0.880	0.774	0.826	0.922
	2	0.867	0.752		
	3	0.931	0.867		
Regulatory focus—Promotion	1	0.930	0.865	0.672	0.800
	2	0.692	0.479		
Regulatory focus—Prevention	1	0.843	0.711	0.739	0.895
	2	0.885	0.783		
	3	0.850	0.723		
Intentions	1	0.936	0.876	0.862	0.962
	2	0.910	0.828		
	3	0.919	0.845		
	4	0.949	0.901		

As the measurement model was validated, the analysis continued with a structural model analysis to test the proposed hypotheses (Fig. 1). All but two hypotheses were validated in their predicted directions. The model had a good fit, with a  $X^2 = 1007.068$  and d.f. = 541 (normed  $X^2 = 1.86$ ), a CFI of 0.95, a TLI of 0.95, and a RMSEA of 0.050 (Hair et al., 2009). The model explained approximately 89 % of the variability of intentions to use, deeming the model appropriate for explaining guests' intentions to use NFC-MP in hotels.

**Table 4** Discriminant validity

Constructs		1	2	3	4	5	6	7
Performance expectancy	1	0.706						
Effort expectancy	2	0.494	0.739					
Hedonic motivation	3	0.719	0.521	0.798				
Privacy concerns	4	0.080	0.045	0.058	0.826			
Regulatory focus—promotion	5	0.196	0.135	0.166	0.000	0.672		
Regulatory focus—prevention	6	0.093	0.034	0.116	0.053	0.187	0.739	
Intentions	7	0.801	0.469	0.817	0.132	0.159	0.102	0.862

Note: The values on the diagonal represent the average variance extracted (AVE) while the values below represent the shared variance (squared correlations)



**Fig. 1** Research and model fit

Of all predictors of intentions, hedonic motivation was the strongest ( $\beta = 0.510$ ,  $p < 0.001$ ). This result is somewhat surprising, as most literature generally supports performance/usefulness constructs as the strongest predictors of adoption behavior (e.g., Kucukusta, Law, Besbes, & Legoh  rel, 2015; Lu, Liu, Yu, & Wang, 2008).

Most notably, this result seems to underscore the importance of the hedonic elements embedded in design, which generally characterize the Apple ecosystem. That is, MP ecosystems that are generally fun and stimulating for consumers to stay engaged and derive hedonic value are likely to stimulate consumers' intentions to use MP. In addition, performance expectancy was found to be a strong predictor of intentions ( $\beta = 0.453$ ,  $p < 0.001$ ), which is in line with the existing literature (e.g., Montazemi & Qahri-Saremi, 2015). That is, regardless of their hedonic value, NFC-MP systems must assist users in completing their tasks. The strength of the two main predictors of intentions seems to suggest two critical facets (functional + hedonic) of the task environment, which are complementary and strongly guide consumers to adoption.

Interestingly, effort expectancy was not confirmed as a significant predictor of intentions, which is not entirely surprising. That is, this study supports a thesis that was advanced and validated in the literature—consumers are able to learn any system, no matter how difficult to use (thus reducing the relevance of effort/ease of use) as long as it is efficient in completing a task and it is enjoyable (Yi, Jackson, Park, & Probst, 2006). As expected, privacy concerns had a negative, albeit low, effect on intentions ( $\beta = -0.137$ ,  $p < 0.001$ ). While the literature documents higher effects of system-related privacy concerns on behavioral measures (e.g., Shin, 2010), arguably, the lower impact of security concerns can be attributable to the generally positive view of consumers of the Apple ecosystem. That is, if consumers view this ecosystem as valuable (Heun, 2015), they are likely to accept its challenges and overcome their privacy concerns.

The regulatory focus constructs had differential impacts on intentions. Specifically, promotion focus did not have a significant impact, while prevention focus had a low significant impact ( $\beta = 0.070$ ,  $p < 0.01$ ), which slightly departs from the existing literature (Lee & Koo, 2012). Moreover, promotion focus influenced prevention focus ( $\beta = 0.421$ ,  $p < 0.001$ ), explaining its variability only to a low extent ( $R^2 = 0.178$ ). That is, iPhone users of NFC-MP in hotels may engage in self-regulation with a predominant prevention focus, as their security and safety needs make their potential losses (e.g., monetary, biographic information loss) appear to be more salient (Brockner et al., 2004). Moreover, consumers for whom the need for security is relevant are likely to engage in a preventive lifestyle (Avnet & Higgins, 2008), which could extend to their utilization of NFC-MP in hotels, as such systems could reflect an ecosystem that allows them to accomplish tasks seamlessly, and eventually fend off failure.



## 5 Contributions and Limitations

This study set out to develop and validate empirically a model explaining iPhone users' intentions to use NFC-MP in hotels. As such, it offers a number of notable contributions to the academic and managerial practice. From an academic angle, this study addresses several critical lacunae in the technology adoption literature. Being first to examine the adoption of NFC-MP, this study advances the overall information systems literature. Moreover, this study's contributions are enhanced by its focus on the Apple MP ecosystem, which, to the authors' knowledge, was never studied. The unique task environment examined here is characterized by high novelty and radically differs in functionality from traditional web-based e-/m-commerce, thus allowing the consumers to uniquely form system perceptions and transcend their personal characteristics into behaviors. Second, at a time when most classic and neo-classic technology adoption theories have encountered criticism (Bagozzi, 2007; Benbasat & Barki, 2007), this study takes a novel approach to examining technology adoption by re-validating within the new and unique context of NFC-MP in the U.S. the roles of the most critical elements of a system's task environment: performance and hedonic value. Moreover, this approach extends the traditional adoption theory by conceptualizing performance more precisely, using more items that reflect more specifically the character of NFC-MP in hotels. In addition, this study clarifies the role of effort expectancy, thus shedding light in an area of the technology adoption literature that is characterized by academic dissent.

Third, this study adds regulatory focus constructs to a model that is based on system perceptions. While other innate consumer characteristics have been incorporated in adoption models, this study goes beyond the traditional consumer traits and incorporates constructs that represent fundamental pillars of differential behavior development. Thus, this study contributes to bridging an important interdisciplinary gap and extending the literature in both information systems and consumer psychology. Finally, by establishing the relatively more minor role of privacy concerns in a commercial ecosystem characterized by high popularity but novel and purported better security protocols, this study advances the overall information systems literature.

As it offers a mapping of the factors leading to intentions to use NFC-MP in hotels, this study offers actionable suggestions for system design and hotel managerial/marketing practice, which would help hotel guests to increase their use of NFC-MP. First, given the strong and equivalent impacts of hedonic and performance factors, it is suggested that MP systems be designed and marketed with an emphasis on entertaining the guests while addressing task functionality. Yet, given the transactional fragmentation of the American hotel environment, if the marketing and deployment of such systems in hotels is geared toward performance attributes (e.g., ability to easily manage the payment options, having an accurate view of the purchasing history, convenience and security), NFC-MP could become instrumental in enhancing the value of any generic hotel stay. Moreover, emphasizing system security at both design and property level could result in lowering

consumers' privacy concerns, and thus increasing intentions to use. Finally, as regulatory prevention focus stimulates, to a certain extent, consumers' intentions to use NFC-MP, decision makers could take into account this variable as a potential segmentation base, and then concentrate their marketing efforts on consumers with preventive focus. Moreover, they can emphasize it in advertising messages for NFC-MP utilization by framing such messages using keywords like "responsibility" or "safety", which can be used to prime prevention focus and thus stimulate behavior (Zhao & Pechmann, 2007).

The study recognizes two limitations, and therefore its results should be interpreted with caution. First, as NFC-MP systems are in their incipient phases of deployment, intentions were used instead of actual behaviors. While intentions are the strongest predictors of behavior and therefore appropriate to be used as surrogates, future research should replicate this study after the mass deployment of NFC-MP, when actual behavior data are more readily available. The second limitation is the study's setting in the U.S., thus reflecting only the infrastructure, business models, and consumer behaviors that characterize the American market. Thus, replicating the study in cross-national settings or comparing adoption across different ecosystems (e.g., IOS, Android) could provide additional insight into the factors that may influence adoption.

## 6 General Conclusions

The study presented here was motivated by the increasing popularity of the Apple e-/m-commerce ecosystem and that of the NFC-MP in all spheres of consumption in the U.S. It offers empirical validation of the factors that stay at the foundation of adoption of NFC-MP in hotels. By recognizing hedonic and performance perceptions as key to iPhone users' intentions to use NFC-MP in hotels, this study represents a strong foundation for future research aimed at explicating the complex set of phenomena that lead to the adoption of the contemporary m-commerce systems.

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## References

- Aluri, A., & Palakurthi, R. R. (2011). The influence of demographic factors on intentions to use RFID technologies in the U.S. hotel industry. *Journal of Hospitality and Tourism Technologies*, 2(3), 188–203.
- Apple (2015). *Apple Pay. Your wallet. Without the Wallet*. Retrieved on August 1, 2015 from <https://www.apple.com/apple-pay/>.

- Ary, D., Jacobs, L., & Razavieh, A. (1996). *Introduction to research in education* (5th ed.). Ft. Worth: Holt, Rinehart, and Winston, Inc.
- Avnet, T., & Higgins, E. T. (2008). Locomotion, assessment, and regulatory fit: Value transfer from "how" to "what". *Journal of Experimental Social Psychology, 39*, 525–530.
- Bagozzi, R. P. (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the Association for Information Systems, 8*(4), 244–254.
- Baptista, G., & Oliveira, T. (2015). Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior, 50*, 418–430.
- Benbasat, I., & Barki, H. (2007). Quo vadis, TAM? *Journal of the Association of Information Systems, 8*(4), 211–218.
- Brockner, J., Higgins, E. T., & Low, M. B. (2004). Regulatory focus theory and the entrepreneurial process. *Journal of Business Venturing, 19*, 203–220.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.
- Dwivedi, Y. K., Shareef, M. A., Simintiras, A. C., Lal, B., & Weerakkody, V. (2015). A generalized adoption model for services: A cross-country comparison of mobile health (m-health). *Government Information Quarterly, in press*.
- Eastlick, M. A., Lotz, S. L., & Warrington, P. (2006). Understanding online B-to-C relationships: An integrated model of privacy concerns, trust, and commitment. *Journal of Business Research, 59*(8), 877–886.
- Fornell, C., & Larcker, D. (1981). Structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.
- Furió, D., González-Gancedo, S., Juan, M. C., Seguí, I., & Rando, N. (2013). Evaluation of learning outcomes using an educational iPhone game vs. traditional game. *Computers & Education, 64*, 1–23.
- Gebauer, H., Johnson, M., & Enquist, B. (2010). Value co-creation as a determinant of success in public transport services: A study of the Swiss Federal Railway operator (SBB). *Managing Service Quality, 20*, 511–530.
- Hair, J. F., Black, W. C., Babin, B. B., & Anderson, R. E. (2009). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- Heun, D. (2015). Is Apple Pay's rising tide sinking other ships? *PaymentsSource*. Retrieved on August 1, 2015 from <http://www.paymentsource.com/news/technology/is-apple-pays-rising-tide-sinking-other-ships-3020434-1.html>.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist, 52*, 1280–1300.
- Hirunyawipada, T., & Paswan, A. K. (2006). Consumer innovativeness and perceived risk: implications for high technology product adoption. *Journal of Consumer Marketing, 23*(4), 182–198.
- Hof, R. (2015). Apple Pay starts to take off, leaving competition in the dust. *Forbes/Tech*. Retrieved on August 1, 2015 from <http://www.forbes.com/sites/roberthof/2015/01/27/apple-pay-starts-to-take-off-leaving-competition-in-the-dust/>.
- Jia, H. M., Wang, Y., Ge, L., Shi, G., & Yao, S. (2012). Asymmetric effects of regulatory focus on expected desirability and feasibility of embracing self-service technologies. *Psychology & Marketing, 29*(4), 209–225.
- Kassner, M. (2014). Apple Pay: More secure or just different? *TechRepublic*. Retrieved on May 20, 2015 from <http://www.techrepublic.com/article/apple-pay-more-secure-or-just-different/>.
- Kim, J., Brewer, P., & Bernhard, P. (2008). Hotel customers perceptions of biometric door locks. *Journal of Hospitality Marketing & Management, 17*(1–2), 162–183.
- Kucukusta, D., Law, R., Besbes, A., & Legohérel, P. (2015). Re-examining perceived usefulness and ease of use in online booking. *International Journal of Contemporary Hospitality Management, 27*(2), 185–198.

- Law, R., Leung, D., Au, N., & Lee, H. A. (2013). Progress and development of information technology in the hospitality industry: Evidence from Cornell Hospitality Quarterly. *Cornell Hospitality Quarterly*, 54(1), 10–24.
- Lee, K. T., & Koo, D. M. (2012). Effects of attribute and valence of e-WOM on message adoption: Moderating roles of subjective knowledge and regulatory focus. *Computers in Human Behavior*, 28, 1974–1984.
- Li, H., Sarathy, R., & Xu, H. (2011). The role of affect and cognition on online consumers' decision to disclose personal information to unfamiliar online vendors. *Decision Support Systems*, 51(3), 434–445.
- Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014). The moderating effect of experience in the adoption of mobile payment tools in Virtual Social Networks: The m-Payment Acceptance Model in Virtual Social Networks (MPAM-VSN). *International Journal of Information Management*, 34, 151–166.
- Lu, J., Liu, C., Yu, C. S., & Wang, K. (2008). Determinants of accepting wireless mobile data services in China. *Information & Management*, 45(1), 52–64.
- Montazemi, A. R., & Qahri-Saremi, H. (2015). Factors affecting adoption of online banking: A meta-analytic structural equation modeling study. *Information & Management*, 52, 210–226.
- Morosan, C. (2014). Toward an integrated model of adoption of mobile phones for purchasing ancillary services in air travel. *International Journal of Contemporary Hospitality Management*, 26(2), 246–271.
- Morosan, C., & Jeong, M. (2008). Users' perceptions of two types of hotel reservation web sites. *International Journal of Hospitality Management*, 27(2), 284–292.
- Muthén, L. K., & Muthén, B. O. (2007). *Mplus user's guide* (5th ed.). Los Angeles, CA: Muthén & Muthén.
- Perez, S. (2014). iTunes App Store Now Has 1.2 Million Apps, Has Seen 75 Billion Downloads To Date. *TechCrunch*, Retrieved August 1, 2015 from <http://techcrunch.com/2014/06/02/itunes-app-store-now-has-1-2-million-apps-has-seen-75-billion-downloads-to-date/>.
- Shin, D. H. (2009). Determinants of customer acceptance of multi-service network: An implication for IP-based technologies. *Information & Management*, 46(1), 16–22.
- Shin, D. H. (2010). The effects of trust, security and privacy in social networking: A security-based approach to understand the pattern of adoption. *Interacting with Computers*, 22, 428–438.
- Toh, R. S., Lee, E., & Hu, M. Y. (2006). Social desirability bias in diary panels is evident in panelists' behavioral frequency. *Psychological Reports*, 99, 322–334.
- Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273–315.
- Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157–178.
- Yi, M. Y., Jackson, J. D., Park, J. S., & Probst, J. C. (2006). Understanding information technology acceptance by individual professionals: Toward an integrative view. *Information & Management*, 43, 350–363.
- Zhao, G., & Pechmann, C. (2007). The impact of regulatory focus on adolescents' response to antismoking advertising campaigns. *Journal of Marketing Research*, 44, 671–687.

# Generating Paths Through Discovered Places-of-Interests for City Trip Planning

Wolfgang Wörndl and Alexander Hefe

**Abstract** The goal of this work is to design, implement and evaluate a solution to generate routes with places-of-interests for a short city trip. In our scenario, a user enters a start and an end point in a web application along with preferences and gets a walking route with interesting places to visit along the way. The place discovery is based on retrieving rated places from Foursquare. Discovered places are then combined to a practical route using a constraint-free and a constraint-based version of our algorithm. The conducted user study showed that the approach worked very well. In addition, further improvement with regard to user preferences for place categories lead to additional benefits in how well the users were satisfied with the results and the match with their preferences.

**Keywords** Recommender system • Tourist trip design problem • City trip planning • User study • Travel • Path finding

## 1 Introduction

Tourists visiting a destination do not only need to find interesting points-of-interests (POIs) for their preferences and interests, but also need to combine them to a practical route to visit them. Social media services such as Foursquare, TripAdvisor or Google Places provide access to reviewed and rated POIs but the more challenging task is to select among them. Navigation systems such as Google Maps and TomTom are designed to generate the shortest and less time consuming path for the user to reach a certain destination from his origin location (Traunmueller & Ava Fatah gen. Schieck, 2013), but do not take worthwhile POIs along the route into account. Existing research on recommender systems (Kantor, Ricci, Rokach, & Shapira, 2010) usually only suggests single POIs but not complete routes.

In our scenario, a visitor to a city wants to walk from a start to an end point with some time to visit POIs along the way accepting some reasonable detours from the most direct route. Thus the user enters the desired locations in a web application along with preferences and gets a walking route with interesting POIs to visit along

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the way. So the main objective of this work is to first discover places in a distinct area that match the user preferences and present them to the user in a sequence that forms a good entertaining route while optionally taking different constraints in consideration such as time and budget. We investigate the problem from a user's perspective with the goal to maximize user satisfaction with the proposed route.

The rest of the paper is organized as follows. Section 2 briefly reviews related work. Then we present our solution in Sect. 3, including place discovery (Sect. 3.1), the constraint-free (Sect. 3.2) and constraint-based variants (Sect. 3.3) of our algorithm, and the implemented web application (Sect. 3.4). In Sect. 4, we describe the evaluation of our approach before concluding the paper with a short conclusion in Sect. 5.

## 2 Background and Related Work

Existing Internet services include systems to help tourists plan excursions including shorter city trips (e.g. [citytriplanner.com](http://citytriplanner.com)) or create longer journey (e.g. [yourtour.com](http://yourtour.com)). These systems are mostly based on rather simple algorithms to find out which POIs a user might be interested in and combine them to a trip. “mtrip” (<http://www.mtrip.com/en/travel-guide>) is a similar mobile solution to support smartphone users.

A more sophisticated recommendation of a trip composed of a sequence of POIs is not a trivial task and an example of the more general Tourist Trip Design Problem (TTDP) (Gavalas, Konstantopoulos, Mastakas, & Pantziou, 2014). A well-known optimization problem that may formulate a simple version of TTDP is the orienteering problem (OP). Thereby, several locations with an associated profit have to be visited within a given time limit. Each location may be visited only once, while the aim is to maximize the overall profit collected on a single tour (Gavalas et al., 2014).

Souffriau, Vansteenwegen, Vertommen, Vanden Berghe, and Van Oudheusden (2008) was one of the earlier approaches to generate a multi-modal tourist itinerary taking various constraints into account. Rodríguez, Molina, Pérez, and Caballero (2012) proposes a multi-criteria model that includes a tourist's wishes and needs, the desired activities and the characteristics of the target area. Hu and Lim (2014) and Verbeeck, Vansteenwegen, and Aghezzaf (2014) are other recent approaches to tackle to OP, but they do not integrate their algorithmic solution in a practical web application. Tanahashi and Ma (2013) did perform two user studies to test their mashup system that allows searching for designing road trips. But their system is more tailored towards exploration and visually accessing how these places may fit an itinerary, not automatic route generation. Kang (2013) presents an approach to convert the cheapest ticket combination problem into a set cover problem but is focused on ticket prices only.

Gavalas, Kenteris, Konstantopoulos, and Pantziou (2012) present an approach to generate daily, personalized tours for visiting a city. An interesting feature is that

their algorithm splits the potentially interesting points-of-interests into multi-day itineraries around a common start/end point such as the hotel location. However, they evaluated their solution with a simulation and a focus on efficiency only. Our approach tries to investigate the problem from a user's perspective to find out if the algorithm results in increased user satisfaction.

### 3 Solution Design

The process of generating a path from a start to an end point with interesting POIs along the way can be split up into two subtasks. First, potential candidate places have to be determined and scored, and then a path finding algorithm need to generate the best route consisting of a subset of these places. In the following, the "baseline" approach refers to a first version of our solution (Iltifat, 2014), while the "improved" or "own" implementation is the second version that was tested and compared to the baseline in our evaluation (see Sect. 4).

#### 3.1 Discovery of Places

##### 3.1.1 Data Sources

We considered Google Place API and Foursquare API as data sources for our solution (Iltifat, 2014). Google Place API (<https://developers.google.com/places>) allows searching for place information on a variety of categories such as establishments, prominent points of interest, geographic locations, and more. It can search for places in the vicinity of a location as well. Foursquare API (<https://developer.foursquare.com/start/search>) also allows searching for venues in an area and returns recommended places based on check-ins and likes of other users. We choose the Foursquare API over Google Places based on preliminary tests, because the Foursquare API returned more diverse places in various categories while the Google Places API contains mostly restaurants and hotels (Iltifat, 2014).

Foursquare API allows for specifying a circular or elliptical region to search in. In our scenario, the user specifies a start and end point. Since we are considering walking routes only at this time, the points must not be farther away than 5000 m. To select the area we want to discover places, we first determine the mid point of the start and end point. Then, we calculate a circle around this mid point with a radius of *distance between start and mid point multiplied with 1.2* and use the resulting area as the search region for the Foursquare API request. Thus, we are able to retrieve points-of-interests in the rough area between the start and end point of the desired route.

The Foursquare API already specifies the category of each place. However, these categories are very specific and must be condensed into fewer categories for which

Fig. 1 Preference elicitation

the user can indicate preferences. In our case, we use six predefined categories that provide a good coverage of places: *Sights & Museums*, *Night Life*, *Food*, *Outdoors & Recreation*, *Music & Events*, *Shopping* and *Other*. The user enters a rating on a scale from 0 (worst) to 5 (best) for each category with each request (see Fig. 1).

### 3.1.2 Scoring of Places

After the places are retrieved and classified, we need to determine a score for each place that reflects how relevant the place is, taking to the user ratings for categories into account as well. The baseline algorithm uses individual “checkin” and “like” numbers from the Foursquare API, but preliminary tests showed that there is not much difference in the corresponding scoring results. Therefore, we solely rely on the total Foursquare “rating” and the amount of votes—i.e. how many people rated the venue—as the score for a place in the own implementation. Since the amount of votes is not as important as the actual rating itself and because the amount of votes can be quite high, we apply a logarithmic scale of votes for the final score of a place:

$$Score = rating \times \log_2 (amount\ Of\ Votes + 1)$$

If not enough Foursquare users have checked in or left reviews for a place yet, the place does not have a Foursquare rating and is removed from consideration. In addition, we remove places with bad ratings to improve performance of the subsequent path finding algorithm. The amount of places removed also depends on the user preferences. If the user specified a low preference for a category, more places are removed in the discovery algorithm. To do so, the baseline solution of our algorithm version multiplied the place rating of each venue by the user preference of the corresponding category. The improved own implementation uses a different way to make sure places with high preference get selected more often. We basically leave the preference scaling up to the path finding algorithm (see below in Sect. 3.2) and only remove places in categories with a user preference of zero in the discovery.



### 3.2 *Constraint-free Algorithm*

After all the places in the relevant area have been categorized and scored, the path finding algorithm creates the proposed route from a subset of these places. Two algorithms, a *constraint-free* and a *constraint-based* one were implemented for this task. We will start explaining the constraint-free algorithm, which just tries to find an entertaining and reasonably short path from the start to the end point without taking any constraints into account.

The constraint-free algorithm is based on the well-known Dijkstra's algorithm to find the shortest path in a graph (Dijkstra, 1959). Dijkstra's algorithm is an iterative algorithm that provides the shortest path from one particular starting node to all other nodes in a graph with non-negative edge path costs. Shortest path means, the algorithm will find the path with minimum distance to travel from source to destination. In our scenario, the nodes are the places with the associated score and the edges represent the distance between the places.

Our algorithm basically generates a weighted, complete graph from all places found by the place discovery algorithm (Sect. 3.1) where the edge weight is defined as the physical distance between its two nodes. Then Dijkstra's algorithm is used to find the best path from start to end point. However, we do not generate the shortest path, as in a complete graph that is obviously always the most direct route from start to end. Instead, we maximize the fraction *entertainment/distance* for each subpath. Here, *entertainment* is the sum of the scores of all venues on the path with the individual scores being the ones previously determined by the place discovery. *distance* is the total path length. So when the algorithm compares two paths from start point to a certain node, it prefers the one for which this fraction is biggest. The rest of the algorithm is the same as for the standard Dijkstra's algorithm.

The amount of places in each of our six predefined categories returned by the discovery algorithm varies greatly among the different categories. Especially in the "Food" category there are often much more venues than in any other category. The result is that a path calculated with the baseline algorithm will often contain many restaurants, even if the food category is set to a lower preference. To account for this problem, the own implementation takes the explained approach as basis, but better correlates the places to the user preferences for each category in the route. To do so, we calculate Pearson's correlation coefficient between two sets: the user preferences for categories and the amount of places per category. Pearson's coefficient  $r$  gives values between  $-1$  (indicating perfect negative correlation) and  $+1$  (perfect correlation), with  $0$  meaning no correlation exists between the datasets.

The idea is that if one category has a rating twice as high as another category, then in the path there should be roughly twice as many places of the first category than there are places for the second category. However, this does not make a statement about how many places there should be in total which still depends on the context, i.e. how many places there are in total in this particular area. Using the correlation coefficient we can only tell if the amount of places in each category are appropriate in relation to each other and in relation to the user's preferences.

This coefficient is used to adjust the entertainment value and will increase the value of places in a category the user likes but which is underrepresented in the set of discovered places using the following formula:

$$\frac{r(\text{preferences, amount Of Places Per Category In Path So Far}) \cdot \text{entertainment}^2}{\text{distance}^2}$$

Further tests showed that the algorithm yields better results if entertainment and distance values are weighted more than the correlation coefficient, which is why we square them. (Both entertainment and distance values are always larger than 1.) When comparing two paths from start point to a certain node, our own algorithm prefers the one for which this fraction is biggest.

### 3.3 Constraint-based Algorithm

An alternative way to create a path from a subset of discovered places is implemented in the constraint-based algorithm. Unlike the constraint-free algorithm described in the previous section, this algorithm now takes time and budget limits for the route into account. In this case, the user can enter the constraints with each request on the application web page (see Fig. 3).

#### 3.3.1 General Description

The algorithm works similar to the constraint-free algorithm with some additional elements. At its core, it is still based on Dijkstra's algorithm to find the best path between the start and end point. However, as an additional preliminary step, each venue is assigned a value for cost and time to spend there (see Sect. 3.3.2). Then, a weighted complete graph is created using the physical direct distance between nodes as edge weight. Using this information, before a subpath is compared against another path in Dijkstra's algorithm, it is checked whether the following conditions are fulfilled:

- the subpath does neither exceed time nor budget limit
- the subpath does not contain more than one restaurant or more than one venue from the night life category

If one of these conditions is not met, the subpath will be rejected. Otherwise, if another valid subpath from start point to this current node has been found prior to the current path, the two subpaths are compared against each other using the *entertainment* value of each path. Just as in the constraint-free variant, *entertainment* is the sum of the scores of all venues on the path with the individual scores from the discovery algorithm (Sect. 3.1). The subpath that has the bigger value will be saved together with the node. Note that this part of the algorithm differs from the

constraint-free algorithm in that we do not utilize the distance between nodes for the comparison of subpaths, just the score of places. The distance is just used for the subpath creation and subsequent constraint check as explained.

### 3.3.2 Estimation of Time and Cost for Each Place

In the baseline algorithm (Itifat, 2014), we used pre-determined fixed values to estimate how expensive a venue in a certain category is and how much time users want to spend there. We designed better time and cost heuristics for the improved version. However, these values are highly dependent on the individual user, so our estimations are only heuristics for an average user.

For activity duration at POIs, Melia-Segui, Zhang, Bart, Price, and Brdiczka (2012) have already derived heuristics for some of our six categories based on a real world Foursquare dataset with 3.7 million users and 300 million checkins. Especially the estimations for how long users spend at restaurants were useful as a starting point to us. The data set revealed that on average, users spend 53 min eating lunch, slightly less for breakfast and a bit more for dinner. These values seem fairly accurate, and so we use 45 min as a rough base estimation of the time to spend at all venues in the “Food” category. However, values for other categories derived from that data set didn’t fit our application particularly well either because the categories that were used in the study did not match our own six categories or because the time values for venues in some categories were too long for our scenario of a city trip. For example, the average time for both “Arts & Entertainment” and “Parks & Outdoors” derived from the data set is about five hours each (Melia-Segui et al., 2012). We assume that most people would like to do multiple activities on a city trip and thus not spend so much time at one location. Therefore we did not directly use these time limits but instead use more realistic estimations with no value more than 60 min to allow routes with multiple attractions even on shorter trips.

In addition, we adjusted the base time heuristics with the ratings for categories the user provides. This is based on the assumption that if a tourist prefers museums, he or she might want to spend more time than average there. Therefore the base estimations for time spent at a place is offset with the following values: rating of 1 (worst):  $-15 \text{ min}$ , rating of 2:  $-5 \text{ min}$ ., rating of 3 (average): no offset, rating of 4:  $+5 \text{ min}$ . and rating of 5 (best):  $+15 \text{ min}$ .

Estimating how much money a user will spend at a certain venue is easier than time estimation because Foursquare already sorts places into four price categories: “cheap”, “moderate”, “expensive” and “very expensive”. This categorization seemed fairly accurate and was converted for our algorithm into concrete values: 8€ for “cheap”, 16€ for “moderate”, 24€ for “expensive” and 32€ for “very expensive”.

However, not all Foursquare venues have assigned price tiers. This can either be due to not enough people having checked in a place yet, or because a fixed price assignment would not make sense for that place. This is true for venues in the category “Outdoors & Recreation”, for example. So if a discovered place has an

assigned price tier, we use this value as cost estimate for this place. If no price information is available, we fall back to a pre-defined heuristics based on the place's category, e.g. 10€ for the category "Other". A better price estimation could be integrated in our algorithm, e.g. adjusting the prices for more expensive cities, or just using price estimations per individual venue, but we did not have access to exacter data on prices. Similar to the constraint-free algorithm, we modify the final *entertainment* value of each place with correlation coefficient to better match it with the user's specified preferences.

### 3.4 Web Application and User Interface

After the routes have been computed, they need to be displayed on a website for the end user. We decided to use a single-page design for our website because not having to click through multiple pages and instead seeing everything in one spot makes it very easy to use. We implemented most of the application in the front end with JavaScript and jQuery. By dynamically loading content and displaying it using JavaScript, the application can respond to user input without have the user click on buttons or links. The back end consists of an Apache Web Server with PHP code and a PostgreSQL database, mostly to store the user feedback.

After a short introductory paragraph about the application and brief instructions, we show a container where the users can enter their preferences for our six categories (Fig. 1). A rating of 0 for a category means that no place from this particular category is shown. Each category has a different colour and a distinct icon, which is used on the result map and list as well. In addition, the user can specify optional constraints for time in minutes and budget in Euros (Fig. 2). If constraints are enabled and entered, the constraint-based algorithm (Sect. 3.3) is used, otherwise the constrained-free variant (Sect. 3.2).

Next, there is a box with two text fields and a map (Fig. 3). In the text fields the user can input the start and end point of the desired route, which will immediately be displayed in the map. The application assists the user in providing valid locations by an auto completion feature proposing locations based on entered substrings. When the user has entered two positions and the paths have been calculated, two routes from start to end point are drawn on the map, one in red and the other in blue

Fig. 2 Optional constraints

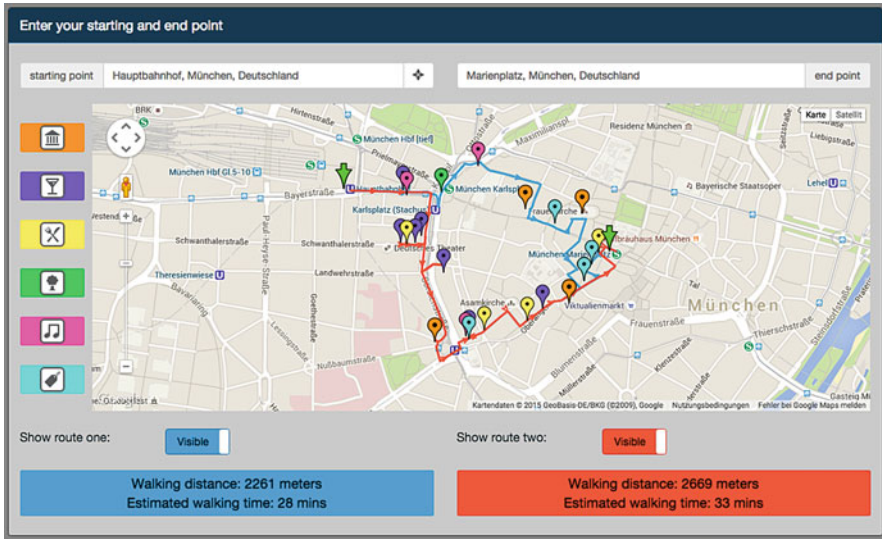


Fig. 3 Generated paths

(Fig. 3). The user can toggle the routes on/off to hide one route for clarity on the map. The web application also displays the selected places for each route as a list (not shown in a screenshot).

We decided to utilize Google Maps for the map with the routes. We do not just draw straight lines between the places on the route but show an actual walking path by means of the Google Directions Service. To display the colour-coded markers for the POIs on the map, we use the Google Maps JavaScript API.

## 4 Evaluation

The approach was evaluated using the explained web application.

### 4.1 Setup

We presented two possible paths for each query to test whether the explained improvements have a positive effect: one path for the baseline, one for the improved implementation. The two paths are shown in red and blue (see Fig. 3). The users were not aware that there were two variants of the algorithm and the assignment to the two colours was randomised. At the end of the result web page, we show a brief questionnaire with the following five questions for both routes (in English):

1. *“The total amount of places was ...”* with response options: *“too low”*, *“low”*, *“perfect”*, *“high”* and *“too high”*
2. *“The length of the path was ...”* with response options: *“too short”*, *“short”*, *“perfect”*, *“long”* and *“too long”*
3. *“How well did your received places match your preferences?”* with response options: *“not at all”*, *“rather not”*, *“fairly well”*, *“quite well”* and *“perfectly”*
4. *“Would you consider taking this route yourself?”* with response options *“no”*, *“maybe”* and *“yes”*
5. *“How satisfied are you with the overall result?”* with response options *“not satisfied”*, *“rather not satisfied”*, *“rather satisfied”*, *“quite satisfied”* and *“very satisfied”*

In addition, there was one final question asking the user directly which of the two routes they like better, red or blue. Finally, we added an input text field for optional comments, which was used fairly often by the participants. The link to the application was distributed using Email lists and posting it to Facebook groups.

## 4.2 Results

During the evaluation period the web application was accessed over 600 times. Some of these visitors are recurring, but it is not possible to determine the exact number of unique visitors since we decided to not use cookies or other means to track users. Users have submitted feedback for city trips in cities all over the world, including Los Angeles, Amsterdam, Bilbao, New York, Hong Kong, Dublin, Porto and many cities in Germany. In all, 533 routes have been computed, and 123 times did people actually submit feedback. Of these 123 data records, 85 were for the constraint-free algorithm and 38 for the constraint-based. Due to limited numbers especially for the constraint-based approach, the following presents the aggregated results.

On average, the direct distance of the submitted start and end points was about 2500 m (with a standard deviation of 1200 m), which makes sense since the maximum allowed distance was set to 5000 m. The generated routes were longer; the average for both routes was almost identical, about 5600 m. On average, the baseline route consisted of 14.3 and the own implementation of 15.4 places.

For the first two questions, the results did not differ much for our two variants. About 50 % stated that the total amount of places was “perfect”, about 12 % thought the number was “too low” and about 16 % found it “too high”. With regard to the length of the generated paths, over 70 % were perfect and only in less than 5 % of the cases, the users chose one of the extreme ends of the scale (too short or too high). This indicates that our principle approach leads to reasonable routes in general.

Figure 4 shows the detailed results for the third question about how well the places matched the users’ preferences. It confirms that the explained modifications

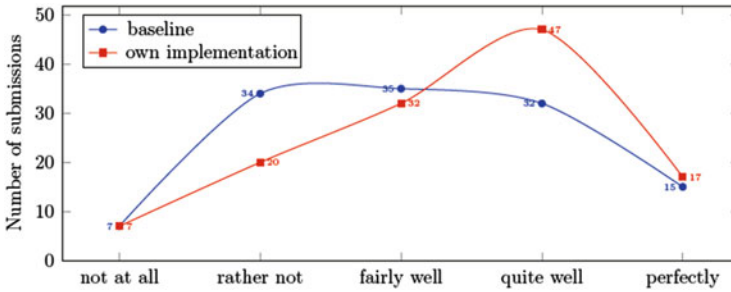


Fig. 4 Results for question #3: “How well did your received places match your preferences?”

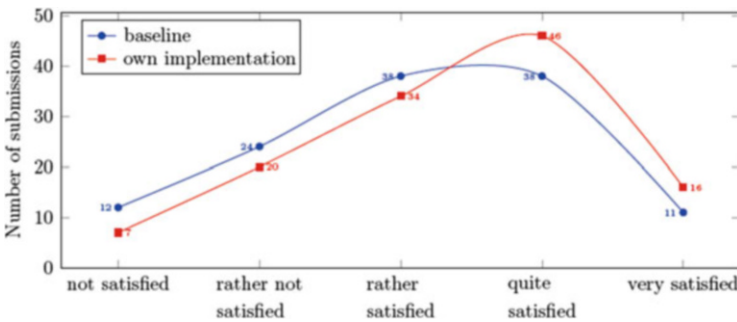


Fig. 5 Results for question #5: “How satisfied are you with the overall result?”

with an improved representation of the user preferences in the generated paths did indeed lead to better results.

In the fourth question about whether the users would actually take this route, a minority of slightly more than 20 % answered “no” and the rest of the votes were about evenly split between “maybe” and “yes” with a slight increase of the “yes” votes for our improved implementation.

Figure 5 shows the detailed results for the fifth and final question. We can see that the own implementation lead to higher satisfaction with the results with 62 % of users stating “quite satisfied” or “very satisfied”.

Finally, we asked the users about which route they preferred. 47 liked the result of the baseline approach better, 18 specified “none” and 58 preferred the own implementation.

As far as the user preference for our six categories (see Fig. 1) are concerned, “Outdoors & Recreation” was most popular with an average rating of 3.48. However, we noted that there are fewer places in this particular category. In contrast, “Shopping” was the least popular category with an average preference of 1.88 in our experiment. Figure 6 shows the detailed distribution of user preferences for the categories.

Thirty three participants used the feature to anonymously submit textual comments and shared their thoughts. A lot of comments were very positive and

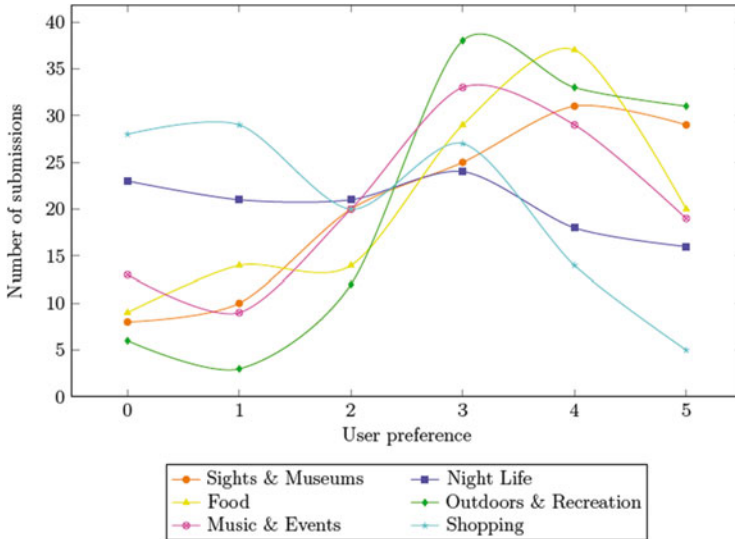


Fig. 6 User preferences for all categories

supportive. For example, some users liked the idea of the application itself or the website design and others wrote that they liked a particular route really well. There were a few critical comments as well, some of them brought up good points to further improve the application. Multiple users commented that there are too many restaurants on the routes in the constraint-free alternative.

## 5 Conclusion

In this paper, we presented an approach to generate routes with discovered places-of-interests for a short city trip. The place discovery is based on retrieving POIs from Foursquare. We do not cache any places and the algorithm works everywhere with up to the minute Foursquare ratings. We have implemented a constraint-free and a constraint-based version of the algorithm in a useful web application. The conducted user study showed that the approach worked very well. In addition, further improvement with regard to the user preferences for categories lead to additional benefits in how well the users were satisfied with the results and the match with their preferences.

One challenge was balancing the amount of places between the categories, e.g. showing one or only very few restaurants despite a lot of discovered places in the “Food” category, but more options for sights. We will try to further improve this in a subsequent version. Other future work include to lift the 5 km restriction on the distance between start and end points and maybe take additional means of transportation other than walking into account (e.g. public transportation). One



option is to also allow round-trips from hotels or other locations. We could also incorporate contextual information about the weather (e.g. recommend more indoor places when it is raining) and visiting time (e.g. dismiss places that are closed on a given date and time) into account. Lastly, machine-learning techniques could be integrated to analyse the submitted feedback and adapt the heuristics of the approach, for example by increasing or decreasing path length.

## References

- Dijkstra, E. W. (1959). A note on two problems in connexion with graphs. *Numerische Mathematik, 1*, 269–271.
- Gavalas, D., Kenteris, M., Konstantopoulos, C., & Pantziou, G. (2012). A web application for recommending personalized mobile tourist routes. *IET Software, 6*(4), 313–322.
- Gavalas, D., Konstantopoulos, C., Mastakas, K., & Pantziou, G. (2014). A survey on algorithmic approaches for solving tourist trip design problems. *Journal of Heuristics, 20*(3), 291–328.
- Hu, Q., & Lim, A. (2014). An iterative three-component heuristic for the team orienteering problem with time windows. *European Journal of Operational Research, 232*(2), 276–286.
- Iltifat, H. (2014). *Generation of paths through discovered places based on a recommender system*. Master's Thesis, Department of Computer Science, Technical University of Munich (TUM), Germany.
- Kang, M. (2013). Integer programming formulation of finding cheapest ticket combination over multiple tourist attractions. *Information and Communication Technologies in Tourism (ENTER 2013)*, (pp. 131–143).
- Kantor, P., Ricci, F., Rokach, L., & Shapira, B. (2010). *Recommender systems handbook*. Berlin/Heidelberg: Springer.
- Melia-Segui, J., Zhang, R., Bart, E., Price, B., & Brdiczka, O. (2012). Activity duration analysis for context-aware services using foursquare check-ins. *International Workshop on Self-Aware Internet of Things*, 13–18.
- Rodríguez, B., Molina, J., Pérez, F., & Caballero, R. (2012). Interactive design of personalised tourism routes. *Tourism Management, 33*(4), 926–940.
- Souffriau, W., Vansteenwegen, P., Vertommen, J., Vanden Berghe, G., & Van Oudheusden, D. (2008). A personalized tourist trip design algorithm for mobile tourist guides. *Applied Artificial Intelligence, 22*(10), 964–985.
- Tanahashi, Y., & Ma, K. L. (2013). OnMyWay: A task-oriented visualization and interface design for planning road trip itinerary. *IEEE International Conference on Cyberworlds (CW)*, 199–205.
- Traunmueller, M., & Ava Fatah gen. Schieck, A. (2013). Introducing the space recommender system: How crowd-sourced voting data can enrich urban exploration in the digital era. *Communities & Technologies 2013*, 149–156.
- Verbeeck, C., Vansteenwegen, P., & Aghezzaf, E.-H. (2014). An extension of the arc orienteering problem and its application to cycle trip planning. *Transportation Research Part E: Logistics and Transportation Review, 68*, 64–78.

# Customer Experiences with Hotel Smartphone: A Case Study of Hong Kong Hotels

Tony Lok Tung Hui, Norman Au, and Rob Law

**Abstract** Competition in the hotel industry is intense in Hong Kong. Providing personalized services through the latest technology is a comparative advantage that hotels can pursue. Recently, many hotels have started to provide complementary “handy smartphones” to guests and have received a positive feedback. This study explores the experiences of customers on the complementary “handy smartphones” provided by hotels and identifies the factors affecting the actual smartphone usage behavior. A survey of 121 hotel guests was conducted on seven major aspects of “handy smartphones” in four Hong Kong hotels. Results revealed that guests were mostly satisfied with the free smartphone provision of hotels. Price, security, and connectivity were among the important aspects leading to the actual usage of these smartphones. Recommendations on the enhancement of “handy smartphones” are provided.

**Keywords** Smartphone • Hotel • Hong Kong • Customer experience

## 1 Introduction

The number of smartphone users has rapidly increased in the recent years of the technological era. Statistics from eMarketer (2014) shows that the number of smartphone users worldwide has reached 1.64 billion, and this number is expected to increase by 32 % to nearly 2.16 billion in 2016. Given their affordable price, advanced technology, and usage convenience, smartphones are used daily for different socializing, information searching, and online purchasing activities. Thus, many businesses have become mobile-centric to capture such a market.

A smartphone is a must-have item for many travelers. The research team of InterContinental Hotels Group reported that 67 % of travellers use smartphones daily during trips (InterContinental Hotels Group, 2014). In the late 2013 survey by Google, checking news and weather respectively ranked as the first and second

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popular smartphone usage activities, followed by activities related to information search and socializing through various social networking sites (Google, 2014).

To fulfill the needs of guests on Internet access during their hotel stay, many of such establishments have provided in-room WiFi services either as a complementary service or as an additional amenity with a small charge. Guests who also want to be connected outdoor through their smartphones while travelling around the city normally hire a portable WiFi device prior to departure from their home country or upon arrival at their destination. Guests with such a preference can also purchase a prepaid SIM card with Internet access; the price of this SIM card varies from one country to another. However, travelling to destinations with language barriers and where users cannot be connected with their original phone numbers may be frustrating. Considering these limitations, some hotels in countries such as Hong Kong, Singapore, and Thailand have started to offer “handy smartphones” to in-house guests since 2014.

“Handy smartphones” are brought to travellers by Tink Labs in 2013. Tink Labs claimed to be the first technology company providing in-bound travellers a comprehensive mobile travel platform around the globe (Tink Labs, 2014). Hotel guests can enjoy unlimited free-of-charge local and international calls to such countries as Australia, China, Japan, the UK, the USA. Furthermore, more than 40 apps are preloaded in each “handy smartphone” in several categories, including social networking (e.g., Facebook and Weibo), news and information (e.g. BBC News and weather), basic utilities apps (e.g. gallery, camera, clock, and calculator), and games (e.g. Angry Birds) and entertainment (e.g., movie and music) (CNN Travel, 2012). With regard to connectivity, unlimited 3G Internet access, Bluetooth, WiFi hotspot, and USB tethering support are enabled. In-bound travellers are the targets of this service; thus, city guide, attraction, and restaurant recommendations as well as various coupons and discounts of products and services are preloaded in each “handy smartphone.” Guests can also install apps according to their own preferences (GIGAOM, 2013).

Hotels can customize their “handy smartphones” to cater their target market in terms of dock, hotel home screen, technical integration, content, push messaging, reporting, and so on. Different plans, designs, and features are provided for partner hotels (Tink Labs, 2014). These “handy smartphones” could offer several advantages to hotels by providing guest engagement and product promotions that hopefully will increase revenue and enhance customer service. As a recent innovation in the industry, how well this product offering satisfies hotel guest and the factors affecting its usage behavior remain to be studied. Basing from a case study of four hotels in Hong Kong, this study aims to investigate the actual usage experiences of hotel guests on the different aspects of these “handy smartphones” and how their usage is associated with various demographic and other factors. Such findings would help hotel practitioners formulate their marketing strategies and further improve their product offerings in the near future.

## 2 Background

### 2.1 *Development of Smartphone*

Mobile phone development can broadly be divided into three stages: dumb phones, feature phones, and smartphones. Dumb phones only provide voice communication and text communication (SMS); hence, this section focuses on feature phones and smartphones.

Feature phones are an advanced version of dumb phones and are embedded with user applications such as games, multimedia, digital camera, or video streaming (Mohammad & Ahson, 2006). Keyboard and additional function keys are normally found on feature phones. Users could install additional software on their phones through web browser on the basis of the Global System for Mobile Communications and Universal Mobile Telecommunications System (Schiefer & Decker, 2008). A feature phone designed with one or a few stand-out features becomes a “camera phone,” “music phone,” and so on. Feature phones are usually more expensive than dumb phones because of the former’s additional capabilities (Goswami, 2013). Although smartphones are more convenient to use than feature phones, Hatfield (2014) summarized several reasons why feature phones are still needed by some individuals. One major reason is using a feature phone as a backup when the smartphone is stolen or broken. Users with a tight budget and elderly are often the major markets for feature phones.

Being the evolved version of feature phones, smartphones provide more features. The multi-tasking feature of smartphones is one of the significant developments explaining their being “smart.” As expected, these highly sophisticated smartphones are more expensive than feature phones. Apart from normal voice and text communication, email and WiFi connectivity, social networking functionality, and 3G/4G network compatibility with dual or quad-core processors are also enabled in smartphones. The new and enhanced features available in smartphones include content transfer by NFC technology and navigating or locating friends through the GPS. Given their other useful and powerful capabilities such as editing and sending documents, recording HD videos, and enhancing image quality, smartphones to some extent could almost be regarded as a mini Notebook computer (Goswami, 2013). Another notable feature of smartphones is that data entry with the keyboard is replaced with a touch-sensitive display triggered by either fingers or a pen.

### 2.2 *Values of Smartphone to Travelers*

Despite the oversupply of information on the Internet, researchers found that most travelers behave rationally. They would normally first gather the information available, compare with various information sources, and select the one with the

most credibility before making their final decisions (Fodness & Murray, 1998). At present, smartphones provide an alternative platform for travelers to search for information. Some scholars have identified four characteristics concerning mobile technology, which could offer a huge potential for tourism practitioners to add values on their product/service. These characteristics are ubiquity, personalization, flexibility, and dissemination. Compared with traditional wired connection or Notebook devices, mobile technology has the advantages of being mobile and flexible to conduct tasks more effectively. Wang, Park, and Fesenmaier (2012) also revealed that smartphones can mediate touristic experiences by changing tourist behavior and emotional states such as coping with unexpected situations and provide excitement.

The benefits and flexibilities offered by mobile technologies are partly attributed to the rapid development of numerous travel applications that are readily available on smartphones. A number of studies have attempted to group these travel applications into various categories. Grün, Werthner, Pröll, Retschitzegger, and Schwinger (2008) first classified these applications into 12 categories based on the nature of services offered, namely, accommodation; emergency, safety, and security; entertainment; gastronomy, navigation and orientation; news; practical information; shopping; sports; tourist attractions; transportation; and weather. Subsequent research by Kennedy-Eden and Gretzel (2012) distinguished travel-related applications into seven categories, namely, navigation (GPS and route search); social (social networking and communication); mobile marketing (contests/awards, alerts, and discounts); security/emergency (medical emergency and information); transactional (finance/banking, tickets/reservation, and shopping); entertainment (games, video/TV, music, e-reader, photography, and fantasy sports); and information. Wang and Xiang (2012) conducted a similar study based on a survey of 300 users, which identified 12 categories of smartphone (iPhone) apps that support travel. These are flight information managers, destination guides, online travel agencies, facilitators, attraction guides, entertainment, food finders, language assistants, local transportation guides, augmented reality, currency converters, and tip calculators.

### ***2.3 Smartphone Usage Behavior***

Choudrie, Pheeraphuttharangkoon, Giaglis, and Zamani (2014) divided user groups in terms of smartphone feature usage into those aged below and above 50 years. The top five smartphone features used by the below-50 age group were making calls, taking photos, browsing websites, using social networks, and text messaging. For the over-50 age group, the top five smartphone features used were making calls, text messaging, e-mailing, taking photos, and browsing websites.

Owing to the high demand for smartphone use during travel, an important hotel selection criterion for most travelers is the availability of complementary WiFi and basic in-room facilities that can support their usage of their own mobile devices.

Despite such a high demand, a survey conducted by Marr (2012) on 152 respondents revealed that actual smartphone usage during foreign travel dropped significantly compared with usage in home countries because of high charges on data roaming overseas. Most of the respondents opted to switch off data services (95 %) and use only calling or texting functions (81 %) when traveling abroad. To avoid roaming charges, 53 % of the respondents used money-saving measures such as free WiFi services provided by hotels and 37 % used a local country/area SIM card as an alternative. Personal data security is also a major concern when using mobile services such as online payments. Other major issues related to smartphone use during travel are insufficient WiFi access, followed by weak signal coverage, slow connectivity, low battery life, and complex hardware configuration (Hanrahan & Krahenbuhl, 2012).

## ***2.4 Conceptual Model***

Although smartphones provided by hotels may not be the same as the devices owned by travelers, prior studies on smartphone usage behavior can be used as references to construct a research framework. The present study proposes a conceptual model (Fig. 1) of the factors that influence the actual usage of smartphones provided by hotels to their guests. These factors include hardware configuration, connectivity, smartphone brand, price, security, product promotion, and declaration on terms and condition.

## **3 Methodology**

With reference to prior literature, a questionnaire was initially designed with 18 measurement items that correspond to seven major aspects to examine the factors that affect usage of hotel handy smartphones. To enhance the accuracy and reliability of the questionnaire, the researcher conducted a pilot test involving students of the School of Hotel and Tourism Management at The Hong Kong Polytechnic University. After revision of the questionnaire text, the final version was designed in both English and traditional Chinese. The questionnaire has two screening questions on whether the hotel guest was 18 years old or above and whether the guest would use the “handy smartphone” provided by the hotel during his/her stay. The questionnaire consisted of five sections. The first three sections asked the respondents to indicate on a seven-point Likert scale their levels of actual satisfaction, perceived importance, and actual usage, which correspond to the seven aspects of handy smartphones during their stay in a particular hotel. The fourth section examined the willingness of the hotel guests to pay for such a service, and the last section collected the demographic data of the respondents in terms of

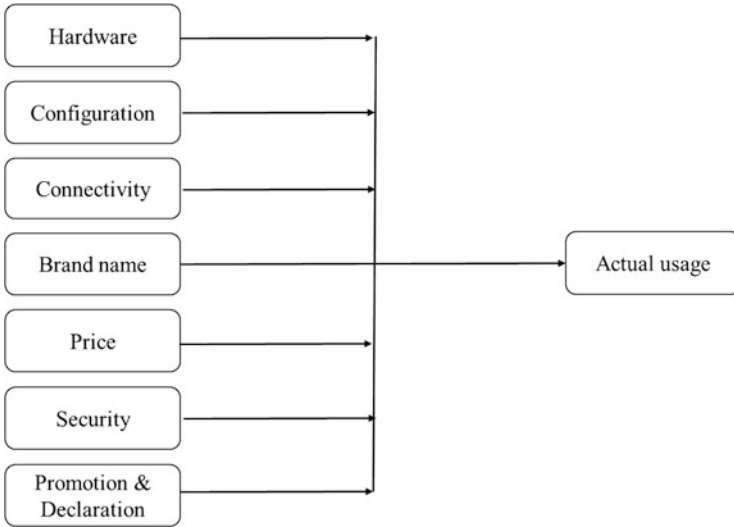


Fig. 1 Conceptual model

gender, age, educational level, purpose and length of stay, and nationality. Statistical software package SPSS (version 23) was used to conduct data analysis.

The samples for this study were the in-house guests of the hotels that offered handy smartphones to their guests. Four invited hotels (two 5-star and two 4-star) agreed to participate in the survey. The data were collected from guests who accomplished the questionnaire placed at the front desk or in guestrooms, as well as at the lobby where the researcher was present from February 16, 2015 to March 27, 2015. A total of 121 usable responses were collected.

### 4 Findings and Discussion

Among the 121 respondents, 41 were from the two 4-star hotels and 80 were from the two 5-star hotels. The proportion of males and females was almost evenly distributed. Majority (45.5 %) of the respondents were in the 26-to-35 age group. Over 80 % of the respondents had bachelor or higher educational degrees. Most of the respondents traveled for leisure (n = 89; 73.6 %). More than three-fourths stayed in the hotel for 2–4 days.

In terms of nationality, 20 respondents were British, 17 were Chinese, 13 were Australian, and 13 were Korean. Asian respondents accounted for almost half of the responses (n = 58; 47.9 %), followed by Europeans (n = 32; 26.4 %) and Americans (n = 17; 14 %).

Tables 1 and 2 present the actual usage satisfaction and importance ratings of hotel guests on various aspects of handy smartphone usage during their stay.

Regarding satisfaction levels, out of the seven major aspects, six had overall mean scores between 5.33 and 5.99, which showed that the respondents were mostly satisfied with the smartphone provided. These factors were hardware, configuration, connectivity, price, security, and promotion. For specific items within these factors, the item “price—free of charge” ranked highest with a mean value of 6.68, followed by “hardware—screen size” (5.88) and “connectivity—WiFi” (5.84). “Brand name” (4.75) was the only factor with a mean rating below 5. Regarding the importance of these smartphone factors, price was the most critical factor in actual usage with a mean value of 6.41; security and connectivity were also critical factors with mean values of 6.31 and 6.12, respectively. Interestingly, “brand name” had the lowest mean score of 3.82 although it was rated as the least satisfactory item. This result implies that the smartphone brand may have a minimal effect on actual usage, and that the brand may matter only in relation to security and function at a reasonable cost.

As shown in Table 3, with regard to the 14 features of the handy smartphone, more than 70 % of the respondents indicated “mapping and navigation” as one of the most frequently used features during their travel. Approximately 60 % used the “phone calls” and “travel guide/itinerary” features. More than 30 % indicated that they often used the smartphone to browse websites (37.2 %) and connect to social networks (33.1 %). The least frequently used features were “voice search” (0.8 %) and “currency exchange” (0.8 %).

Although all the mobile smartphones in the four surveyed hotels were provided free to the guests, 38 % of the respondents were willing to pay a daily fee. Among these respondents, most (26.1 %) were willing to pay HK\$50 per day. On the opposite side, 2 respondents (4.3 %) among the total 121 indicated their willingness to pay only HK\$5 per day. Overall, only 17.3 % of the respondents were willing to pay a daily fee of above \$50. These findings imply that most hotel guests regarded the provision of smartphones as a welcome service that they would pay for if necessary.

Two independent sample *t*-tests were conducted to analyze how the satisfaction and importance levels of various smartphone aspects would vary with gender (Table 4). Female guests were found to have significantly higher satisfaction level than male guests on the factors “connectivity—Bluetooth” with a mean value of 5.58 Vs 4.97 ( $t = -2.77, p = .006$ ) and “connectivity—call quality” with a mean value of 5.95 Vs 5.65 ( $t = -1.99, p = .049$ ). Compared with male users, female users in general were relatively less interested in technical aspects (such as Bluetooth) of smartphones; thus, the former group may be satisfied more easily as long as the device is functioning. This finding is reflected in the significantly lower mean score (5.92) on the importance of “connectivity” as perceived by female guests compared with male guests ( $t = 2.19, p = .032$ ).

From the perspective of the purpose of stay, the *t*-test results in Table 5 indicate that leisure guests (mean = 5.92) had a significantly higher satisfaction level than business guests (mean = 5.38) on the factor “connectivity on 3G” ( $t = -2.30, p = .023$ ). The probable reason is that business guests generally have a greater need to stay connected constantly with their clients or companies. The smartphones



**Table 1** Mean ratings of satisfaction with smartphone factors (n = 121)

Smartphone aspects	Mean	Std. deviation
Hardware—Specification	5.73	1.041
Hardware—Screen size	5.88	1.115
Hardware—Color of handy	5.29	1.200
Hardware—Battery life	5.45	1.354
Hardware—Weight	5.51	1.239
Mean average	5.57	–
Configuration—Operating system	5.28	1.134
Configuration—Storage	5.29	1.083
Configuration—Display	5.49	1.111
Mean Average	5.35	–
Connectivity—3G	5.78	1.173
Connectivity—WiFi	5.84	1.118
Connectivity—Bluetooth	5.28	1.253
Connectivity—Call quality	5.76	1.096
Mean Average	5.67	–
Brand name—Brand	4.75	1.199
Mean Average	4.75	–
Price—Free of charge	6.68	.580
Price—Deposit	5.29	1.417
Mean Average	5.99	–
Security—Data privacy	5.78	1.208
Mean Average	5.78	–
Promotion—Introduction/demonstration	5.31	1.257
Promotion—Terms and conditions	5.35	1.078
Mean Average	<b>5.33</b>	–

**Table 2** Importance of smartphone aspects (n = 121)

Smartphone aspect	Mean	Std. deviation
Hardware	5.42	1.413
Configuration	5.19	1.540
Connectivity	6.12	1.077
Brand name	3.82	2.017
Price	6.41	.963
Security	6.31	1.183
Promotion	5.21	1.349

of business guests are often considered as an essential communication channel; thus, these guests are likely to be more demanding than leisure guests with regard to 3G connectivity.

One-way ANOVA was conducted to determine how the satisfaction and importance levels of smartphone factors vary with the age of hotel guests and hotel star rating (Table 6). Two significant relationships were identified. First, a significant relationship was observed between the age group and satisfaction level for the

**Table 3** Most frequently used features (n = 121)

Features	Frequency	Percentage
Mapping and navigation	87	71.9
Making phone calls	71	58.7
Travel guide/itinerary	71	58.7
Browsing websites	45	37.2
Using social networks	40	33.1
E-mailing	31	25.6
Taking photos	29	24.0
Translation	27	22.3
SMS/text messaging	20	16.5
Calculator	18	14.9
Using VoIP	18	14.9
WiFihotspots	18	14.9
Downloading applications	5	4.1
Filming videos	5	4.1
Playing games	4	3.3
Voice search	1	0.8
Currency exchange	1	0.8

**Table 4** *t*-test results on significant effect of gender on satisfaction and importance levels of smartphone aspects

Variable	Smartphone aspects	Mean (s.d.)		<i>t</i> -test for equality of means		
		Male	Female	t	df	Sig (two-tailed)
Satisfaction	Connectivity—Bluetooth	4.97 (1.25)	5.58 (1.20)	-2.77	119	0.006
	Connectivity—Call quality	5.56 (1.18)	5.95 (.98)	-1.99	119	0.049
Importance	Connectivity	6.34 (.82)	5.92 (1.25)	2.19	119	0.032

**Table 5** *t*-test results on significant effect of purpose of stay on satisfaction levels of smartphone aspects

Variable	Smartphone aspects	Mean (s.d.)		<i>t</i> -test for equality of means		
		Business	Leisure	t	df	Sig (2-tailed)
Satisfaction	Connectivity—3G	5.38 (1.31)	5.92 (1.09)	-2.30	119	0.023

factor “hardware—weight” ( $F = 2.294, p = .049$ ). A post-hoc test showed that guests in the 66-and-above age group had a significantly higher level of satisfaction (mean = 6.33) than those in the 18-to-25 age group (mean = 4.93). Although all the mean values were above the 3.5 midpoint, the younger group of customers consisted of users who were generally experienced in using the latest smartphone models and therefore might be more demanding than older users with regard to the portability of the hotel-issued smartphone. Interestingly, the youngest group had the

**Table 6** ANOVA results on significant effect of age group on satisfaction and importance levels of smartphone aspects

Variable	Smartphone aspects	Sum of squares	df	Mean square	F	Sig.
Satisfaction	Hardware—Weight	16.71	5	3.341	2.294	0.049
Importance	Security	15.95	5	3.19	2.412	0.04

lowest mean value on the perceived importance of “data security” (mean = 5.36), which was significantly lower than that of the 26-to-35 age group (mean = 6.49). Owing to a limited number of cases that were classified in terms of specific nationalities and educational levels, the ANOVA test could not be conducted reliably using these two demographic variables. Lastly, hotel star rating did not have any significant effect on the satisfaction or importance level indicated by guests with regard to various smartphone aspects.

## 5 Conclusion

The competition in the hotel industry is fierce. To remain competitive, hotels have to differentiate and add value to their products and services. The results of this study show that offering complimentary “handy smartphones” to guests is a promising way for hotels to keep up with the growing need to satisfy market demand. Of course, with the fast pace of technological change, constant market research and evaluation have to be conducted to fine tune both the smartphone hardware and the services in accordance with the needs and tastes of the target market. Thus far, studies on how smartphone usage relates to tourist perception and marketer expectations on mobile marketing are limited (Kim & Law, 2015). Notably, the use of smartphones during travel is also indirectly shaped by travel scenarios and personal characteristics (Wang, Xiang, & Fesenmaier, 2014).

In general, most hotel guests involved in the present study were satisfied with the hardware and features of the given smartphone. The highest mean and importance score on “price—free of charge” suggested that the complimentary offer was a pleasant surprise for the hotel guests. Front desk staff should exert further effort to promote the benefits of using the handy smartphone. Some hotel employees may be trained in using the smartphone so that they can assist guests in using such a device anytime. Although majority of the survey respondents are willing to pay for smartphone services, continuing the current free services and enhancing the features may be beneficial.

Regarding the features, navigation and travel guides are among the popular ones; thus, up-to-date applications related to these aspects should be installed. As guests are likely to take the device with them during their travel, the hotels may consider providing portable smartphone chargers for rent. Such a service will ensure sufficient battery power for whole-day usage of smartphones, especially if the guests use power-consuming features such as website browsing and navigation. Hotels still

have a huge potential to promote their own facilities and services through smartphones although such a feature is not frequently used at present. By integrating the hotel services with the guest database, the hotel can offer highly personalized and customized services on the mobile platform in the near future.

Smartphone connectivity to the Internet through various means is another major concern of hotel guests. Thus, hotels have to consistently ensure fast and reliable WiFi connection within their premises. Hotels that cater to business travelers are likely to have a majority of male customers. The findings showed that male guests rated connectivity more highly than female guests did but the former were less satisfied with this aspect than the latter. Hotel managers may have to constantly ensure that the hardware specifications and capacity are sufficient to meet the growing demand for wireless connection at the hotel.

From the perspective of the smartphone provider, which in this case is Tink Labs, the findings suggested that the brand name of the handy smartphone may not be as critical as its technical performance. Thus, investment should be increased to improve the hardware performance in terms of weight, speed, and design, as well as to enhance the software in terms of developing useful new applications. Further cooperation with current and future potential hotel clients may be necessary to identify and develop effectively customized products in the near future.

In conclusion, the initial investment costs for hotels to provide complimentary smartphones to their guests are undoubtedly high. These costs include not only the rental agreement charge set by the smartphone provider and the ongoing customized mobile application development, but also the potential revenues that are foregone, such as those for international calls and Internet connection. Additional expenses could be incurred in relation to loss and damage of smartphones as well as staff training. Nevertheless, such devices can facilitate personal guest management and internal product communication/promotion, which in turn could generate positive word-of-mouth on various social media platforms. With the fast development of sophisticated mobile technology and rising expectations of international travelers, the benefits could outweigh the costs in the long run.

The present study has certain limitations. The small sample size indicates that the findings cannot be generalized to the entire market. With the relatively short history of smartphones being offered by hotels, comprehensive comments on usage experiences are limited. Thus, future studies can expand the scope of the survey to other countries to generate a larger sample size.

## References

- Choudrie, J., Pheeraphuttharangkoon, S., Giaglis, G., & Zamani, E. (2014). *Investigating the adoption and use of smartphones in the UK: A silver-surfers perspective*. Hertfordshire: University of Hertfordshire.
- CNN Travel. (2012). *Never off the grid: Smartphone rental for tourists in Hong Kong*. Retrieved October 10, 2014, from <http://travel.cnn.com/hong-kong/visit/never-grid-smartphone-rental-tourists-hong-kong-426578>

- eMarketer. (2014). *Worldwide smartphone usage to grow 25 % in 2014*. Retrieved September 20, 2014, from <http://www.emarketer.com/Article/Worldwide-Smartphone-Usage-Grow-25-2014/1010920>
- Fodness, D., & Murray, B. (1998). A typology of tourist information search strategies. *Journal of Travel Research*, 37, 108–119.
- GIGAOM. (2013). *Going to Hong Kong? Handy \$8.75 daily phone rental has unlimited voice, texting and 3G*. Retrieved October 10, 2014, from <https://gigaom.com/2013/03/11/going-to-hong-kong-handy-8-75-daily-phone-rental-has-unlimited-voice-texting-and-3-g/>
- Google. (2014). *Six things you need to know from Google's "The 2013 Traveler" study*. Retrieved September 22, 2014, from <http://www.htrends.com/trends-detail-sid-76664.html>
- Goswami, P. (2013). *Difference between smartphone, feature phone and mobile phone*. Retrieved October 20 from <http://www.techmagnifier.com/opinion/difference-between-smartphone-feature-phone-and-mobile-phone/>.
- Grün, C., Werthner, H., Pröll, B., Retschitzegger, W., & Schwinger, W. (2008). Assisting tourists on the move, an evaluation of mobile tourist guides. In X. Busquets, & J. Wareham (Eds.), *Proceedings of 7th international conference on mobile business (pp. 171–180)*. Barcelona 07–08: IEEE Computer Society.
- Hanrahan, J., & Krahenbuhl, D. (2012). *An assessment of Tourist Demand and Use for travel guides: A Focus on the use of new technology such as SMARTPHONES and downloadable "APPS"*. Failte Ireland.
- Hatfield, L. (2014). *Smartphone versus feature phone: Spot the difference!*. Retrieved October, 20 from <http://www.mobilephones.com/articles/smartphone-vs-feature-phone/>
- InterContinental Hotels Group. (2014). *We're all going on a smartphone vacation*. Retrieved September 19, 2014, from <http://finance.yahoo.com/news/were-going-smartphone-vacation-200100591.html>
- Kennedy-Eden, H., & Gretzel, U. (2012). A taxonomy of mobile applications in tourism. *E-review of Tourism Research*, 10(2), 47–50.
- Kim, H. H., & Law, R. (2015). Smartphones in tourism and hospitality marketing: A literature review. *Journal of Travel and Tourism Marketing*, 32, 692–711.
- Marr, K. (2012). *Smartphone use by tourism and travel consumers*. Targeting Innovation Ltd.
- Mohammad, I., & Ahson, S. (2006). *Smartphones (Research Report series)*. Chicago: International Engineering Consortium.
- Schiefer, G., & Decker, M. (2008). Taxonomy for mobile terminals—A selective classification scheme. In INSTICC Press (Ed.), *Conference Proceedings: International Conference on E-Business 2008*, (pp. 255–258).
- Tink Labs. (2014). *About Us*. Retrieved September 18, 2014 from <http://handy.travel/hk/tc/about-us>.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387.
- Wang, D., & Xiang, Z. (2012). The new landscape of travel: A comprehensive analysis of smartphone apps. In M. Fuchs, F. Ricci, & L. Cantoni (Eds.), *Information and communication technologies in tourism 2012* (pp. 308–319). Wien, New York: Springer.
- Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research*, 48, 11–26.

# Assessment of Perceived Risk in Mobile Travel Booking

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**Abstract** Considering the increasing prevalence of smartphones in travel experiences, a relatively low level of mobile booking for travel products suggests the importance of understanding the perceived risk that inhibits mobile consumption behaviours among travellers. Based on responses from an online panel, this study identified the multidimensional facets of perceived risk associated with mobile travel booking, which include time risk, financial risk, performance risk, security risk, psychological risk, physical risk, and device risk. Further, it was identified that there are antecedents that contribute positively (i.e., collection of personal information) and negatively (i.e., consumer innovativeness, trust, and visibility) to perceived risk. Finally, this research estimated the effects of perceived risk on behavioural outcomes, including perceived usefulness, attitudes, and booking intentions. Implications to alleviate or reduce perceived risks are provided.

**Keywords** Perceived risk • Mobile booking • Smartphones

## 1 Introduction

The advancement of mobile technology has reshaped not only the ways travellers collect and share information, but also communicate with service providers and among themselves (Neuhofer, Buhalis, & Ladkin, 2014). Due to the distinctive features of mobile system, including wireless interface and location-based services, travellers are able to obtain information on their own schedule to meet their spontaneous needs, as well as acquire personalized information to fulfil their mobility-related desires (Wang, Park, & Fesenmaier, 2012). Accordingly, the number of smartphone users who accessed travel-related content dramatically

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increases. Interestingly, however, the number of online travellers who actually purchased travel products is still relatively low. Of smartphone users in the UK, only 16 % and 14 % of them have booked hotels and air tickets, respectively. Further, mobile purchasing for attractions and activities appear even smaller proportion by 8 % (Expedia Media Expedia Media Solution, 2014). Even in the fastest growing mobile booking market, China, where more visitors access travel websites via mobile (China Internet, 2015), only about 38 % of travellers make online bookings through mobile (eRevMax, 2014). This current tendency shows that while travellers engage with mobile technology until the stage of alternative evaluation in the decision making process, they seem to confront a significant challenge to accomplish the transactional goal using the intelligent devices.

Perceived risk, which stands for a consumer's belief about the potential uncertainty associated with negative outcomes in a purchase situation, is believed to be one of the main barriers that make consumers reluctant to perform purchasing decisions (Kim, Ferrin, & Rao, 2008). The discrepancy between consumers' judgement and actual performance exists due to lack of evidence about its significance. This asymmetry results in perceived risk for consumers. Particularly, purchasing travel products using mobile phones is different from traditional and Internet shopping behaviours due to distinctive aspects that characterize mobile phones, such as hidden and unconscious computing, location-aware systems, smaller screens, and instant activities (Yang & Zhang, 2009). Since mobile interface is essentially self-service technology, mobile shopping places a considerable burden and responsibility on its users (Cunningham, Gerlach, Harper, & Young, 2005). Therefore, a loss incurs from an improper purchase decision becomes the sole blame of the consumer, who has very limited recourses for correcting errors.

Besides, in the early adoption stage of an IT-enabled artefact such as mobile tourism, people are uncertain not only about the services they look for, but also about the soundness of the underlying technology platform. The features of mobile technology induce increments of risk perceived by consumers when purchasing experiential products (Luo, Li, Zhang, & Shim, 2010). In comparison to general goods, the intangibility of services may reduce confidence on consumer decisions and thus increase risk perception. Consequently, this dual uncertainty related to the context of mobile technology and tourism escalates the importance of research to understand the major dimensions of risk perceived by travel consumers and to identify the antecedents and consequences on their response to the perceived risk (Luo et al., 2010). In fact, tourism researchers have largely paid attentions to investigating adoption and role of mobile technology in enhancing travel experiences. However, there is paucity in research assessing perceived risk as one of the inhibitors for consumer choice in tourism field (Kim, Kim, & Leong, 2005). A number of researchers in information management suggested the relevance and suitability of the multidimensional model of perceived risk suggested by Jacoby and Kaplan (1972) to mobile services study (Lee, McGoldrick, Keeling, & Doherty, 2003). Therefore, this research (1) proposes the multi-facets of risk perceived by travellers when they use mobile devices to purchase travel products and (2) identify the antecedent to and effects of the risk on online travellers' behaviours so that the suggestions to alleviate the risk can be provided.

## 2 Literature Review

### 2.1 Facets of Perceived Risk

Consumers perceive several types of risk in the circumstance where they purchase products using advanced technology. Jarvenpaa and Todd (1996) stated that consumer behaviour to adopt new technology is associated with the traditional facets of perceived risk. In particular, security and/or privacy issues were regarded as an important concern for online shopping (Crespo, del Bosque, & de los Salmones, 2009). Consumers need to provide sensitive information (e.g., credit card information) while transacting via the Internet and, in return, receive restricted information about the products (or services) and the vendors. These can cause anxiety over the outcomes of the transaction, which are likely to be considerable issues. In this vein, Featherman and Pavlou (2003) proposed a comprehensive model of perceived facets of risk, comprising of time risk (i.e., loss of time due to difficulty in navigation, delays in processing transaction, etc.), psychological risk (i.e., disappointment and frustration that can be experienced while purchasing products), privacy risk (i.e., loss of sensitive personal information), financial risk (i.e., monetary loss associated with online purchases), performance risk (i.e., poor product quality), and social risk (i.e., purchases result in disapproval of family or friends).

Importantly, perceived risk is situation specific, which suggests that the types of risk should be formed with consideration of a particular situation an individual encounters. Consumers use an innovative technology (i.e., smartphones) that is relatively less familiar when compared to other devices (e.g., PCs). Consumers face challenges from possible malfunctions of the technology, such as devices running out of battery, unauthorized access or prohibition to an application, and unpermitted interaction (e.g., frequent upgrade of applications) (Kim, Chang, Wong, & Park, 2013; Yang & Zhang, 2009), which suggests technological complexity as a facet of risk (Bhatnagar, Misra, & Rao, 2000). Similarly, tourism scholars referred to this as equipment risk (i.e., the possibility of mechanical or equipment problems in a trip to a destination) (Sonmez & Graefe, 1998). That is, travellers are afraid of potential problems in their equipment (sources/devices) that is vital for them to achieve expected travel experiences. The results of Roehl and Fesenmaier (1992)'s study revealed that equipment risk is the highest risk facet compared to financial, psychological, physical, satisfaction, time, and social risks in travel decision making process. Accordingly, it is argued in this study that specific risk associated with a technological device that enables online travellers to purchase travel products (goal-achievement) is noteworthy in this research. For instance, physical risk (the possibility to cause a health hazard to people) and device risk (the potential loss caused or intercepted by unreliable technology). Thus, this research proposes the following facets of perceived risk:



*H1* Perceived risk associated with mobile travel booking is multi-faceted, consisting of time risk, psychological risk, privacy risk, security risk, financial risk, performance risk, social risk, physical risk, and device (technological) risk.

## ***2.2 Antecedents and Consequences of Perceived Risk***

Previous studies have suggested different antecedents of perceived risk in general consumption settings (e.g., Conchar, Zinkhan, Peters, & Olavarrieta, 2004; Dholakia, 2001; Dowling & Staelin, 1994) and in contexts involving information technologies (e.g., Donthu & Garcia, 1999; Lim, 2003). These antecedents are associated with the characteristics of consumers, vendors, technology, and consumption contexts. According to Conchar et al. (2004), individual characteristics serve as a pervasive influence on perceived risk processing among consumers. Researchers termed the enduring traits of individuals related to uncertainty and risk differently, including risk aversion (Kahneman & Tversky, 1979), risk tolerance (Sitkin & Pablo, 1992), and risk-taking propensity (Bromiley & Curley, 1992), all of which are useful to predict risk-taking behaviour (Conchar et al., 2004). In particular, many proposed consumer innovativeness traits as a determinant of perceived risk in consumption situations involving technological systems (e.g., Aldás-Manzano, Lassala-Navarré, Ruiz-Mafé, & Sanz-Blas, 2009). These traits manifest in novelty seeking tendency (Hirunyawipada & Paswan, 2006), including adoption of what others might view as risky behaviour. In line with Donthu and Garcia's (1999) who suggest that internet shoppers are less risk averse than non-shoppers, innovative consumers demonstrate higher risk-taking propensity. Therefore, it can be suggested that the more innovative the consumers are, the less they would perceive risk in mobile travel booking.

Secondly, previous research placed trust as an antecedent of perceived risk (e.g., Cheung & Lee, 2000; Kim et al., 2008). Trust is a prerequisite for successful commerce because unless trust is involved, consumers are naturally hesitant to make purchases (Gefen, Rao, & Tractinsky, 2003; Jarvenpaa & Tractinsky, 1999; Jarvenpaa, Tractinsky, Saarinen, & Vitale, 1999). In mobile commerce, as consumers take chances from the uncontrollable future and the free actions of others (e.g., vendors, agents, technologies), trust is considered crucial in dealing with the uncertainty. Trust is defined as one person's behavioural basis for her belief about the characteristics of another (Mayer, Davis, & Schoorman, 1995), a consumer's willingness to behave in a manner that assumes another party will behave in accordance with expectations (Deutch, 1960; Ratnasingham, 1998). Cheung and Lee (2000) found that consumers' trust toward internet vendors is negatively associated with their perceived risk of online shopping. In the context of location-based services on mobile devices, Aloudat, Michael, Chen, and Al-Debei (2014) identified trust in technologies and the underlying infrastructure through which services are provided to predict adoption of such services. Therefore, it can be

suggested that as trust toward the use of smartphones for travel booking increases, consumers are likely to perceive less risk.

In the field of information technology, previous research suggested the influence of visibility (i.e., exposure to and ability to observe the applications of technology) in reducing perceived risk (e.g., Aloudat et al., 2014; Leung & Wei, 1999; Vishwanath & Goldhaber, 2003). Rogers (1995) refers to this as observability, which is the degree to which the results of technology innovation (in this case, the applications and outcomes of using smartphones for travel booking) are visible to others. Additionally, Moore and Benbasat (1991) suggest the term demonstrability to explain observability and communicability of innovative technology, which is in line with Zaltman, Duncan, and Holbek's (1973) proposition that innovation with more visible advantages is more likely to be adopted. For non-adopters, visibility reduces uncertainty associated with purchasing intangible travel products using unfamiliar technologies. Therefore, it is suggested that the visibility of smartphone use for travel booking reduces perceived risk. Finally, smartphones are equipped with applications that automatically collect and store personal information of their users such as transaction history and locational data. While turning on location services may assist in enhancing experience during information search and booking process (e.g., for context-aware systems to suggest a range of relevant travel products in proximity), consumers regard personal location information as highly sensitive. Consumers' perception of the collection of an extensive amount of personal data and the sharing of identifiable information with service providers (e.g., vendors) contributes to privacy concerns (Anuar & Gretzel, 2013; Junglas & Spitzmuller, 2005), which is a facet of risk. Therefore, it can be suggested that the collection of personal information increases perceived risk in mobile travel booking.

*H2* Consumer innovativeness (a), trust (b), visibility (c), and collection of personal information (d) influence perceived risk.

Perceived risk that is attributable to the use of information technology has been shown to inhibit product evaluation and adoption (Dowling & Staelin, 1994). It was suggested in multiple studies that perceived risk is negatively associated with perceived usefulness, attitude toward technology, and behavioural intention to use technology (e.g., Featherman & Pavlou, 2003; Gefen, Karahanna, & Straub, 2003; Jarvenpaa et al., 1999; Lu, Hsu, & Hsu, 2005). Perceived usefulness, the positive utility people identify from the use of information technology, is adversely affected by perceived risk (Featherman & Pavlou, 2003). Additionally, multiple studies link perceived risk negatively with attitude toward technology (see van der Heijden, Verhagen, & Creemers, 2003). In a general consumption situations, lowered perceived risk levels are expected to enhance consumers' responses in terms of purchase intention (Mitchell, 1999; Mitchell & Vassos, 1998). In the contexts of online shopping, multiple studies support the negative influence of perceived risk on online purchase intention (see Chang & Chen, 2008; Kim et al., 2008). That is, the more consumers perceive risk in purchases over the internet, the less likely they are to purchase products or services online (Kuhlmeier & Knight, 2005). Finally,

perceived usefulness and attitude toward information technology are suggested to contribute positively to behavioural intention to adopt the technology (see Davis, Bagozzi, & Warshaw, 1989).

*H3* Perceived risk influences perceived usefulness (a), attitude (b), and intention (c) to use smartphones for travel booking.

*H4* Perceived usefulness (a) and attitude (b) influence intention to use smartphones for travel booking.

### 3 Methodology

#### 3.1 Measurement Items

Measurement items were drawn from related literature and revised to accommodate mobile travel booking context. A carefully structured instrument was used to measure the theoretical variables using a five-point Likert scale. The questionnaire consists of four sections. The first part asked respondents about their experiences in the most recent trip in order to understand the travel behaviours. The second section inquires of respondent's usage of and perceptions to using smartphones, including past experience mobile booking accommodations, technological innovativeness, trust (Junglas & Spitzmuller, 2005) visibility (Aloudat et al., 2014) and collection (Junglas & Spitzmuller, 2005) as well as perceives usefulness (Aloudat et al., 2014), attitudes toward and intention to use smartphones to purchase travel products. The third section measures the perceived risk facets: social risk, time risk, financial risk, performance risk, security risk, privacy risk, psychological risk and device (technological) risk (Featherman & Pavlou, 2003; Kim et al., 2013). The final section seeks demographic information: gender, age, level of education, job position and monthly income.

In order to reduce the measurement error, academic experts, including doctoral students and academic staff in relevant field, were invited to examine ambiguous definition or questions that are difficult to answer. Once face validity was confirmed, the questionnaire was developed in English, translated into Mandarin, and then translated back to English. The back translation method was used to avoid translation errors and maintain consistency of the meanings conveyed in words (Brislin, 1986). Two versions of surveys in English and Chinese were sent to 20 Chinese postgraduate students who study tourism in the UK, in order to re-check the content validity. China was selected as a context for this study due to its high growth rate in mobile use among travellers (China Internet, 2015).

### **3.2 Data Collection and Respondents Characteristics**

An online survey was distributed via an online marketing research company that encompasses one of largest online consumers in China ([www.sojump.com](http://www.sojump.com)) in July, 2014. This company distributed web-based surveys to randomly selected panel members. In order to identify valid sample for this study, a couple of filtering questions were asked: (1) “Have you ever used smartphone in everyday life?” and (2) “Did you use smartphone to search for information about accommodation in the most recent trip?” Of 1,300 invitations, 411 respondents (18 years and older) meet the sample requirements and completed all of the questionnaires, indicating 31.6 % response rate. Female respondents (57.4 %) are slightly more than male (42.6 %), and about 78 % are 30 years or younger. Among those who revealed their annual household income, about 65 % reported their salary less than ¥80,000. Most respondents have a bachelor’s degree (75.7 %) and are employed in private companies (60.6 %). Approximately, half of respondents (65.2 %,  $n = 268$ ) have booked a hotel using their smartphones.

### **3.3 Data Analysis**

Descriptive analysis was conducted to understand the characteristics of respondents and to identify the distributions of the data relevant to the variables in the theoretical model. Then, Structural Equation Modelling (SEM) using M-Plus assessed the notion of multi-dimensional perceived risk. Specifically, a second-order CFA was performed to measure the relative importance of each risk facets in regard to the consistent goodness-of-fit indexes as well as AIC (Akaike Information Criteria) to compare between original and modified CFA models (Kline, 2010). Third, Partial Least Square analysis (PLS) using SmartPLS was conducted to estimate the proposed relationships. Importantly, this study includes the potential to evoke common method bias as the same measurement medium was used to collect data for all constructs. Based upon the suggestions by Podsakoff, MacKenzie, Lee, and Podsakoff (2003), this research adopted three different approaches to test for common method bias: Harman’s single factor test, correlation matrix, and a latent variable approach (or the marker variable method).

## **4 Results and Discussion**

### **4.1 Stage 1: Assessing Perceived Risk**

A first-order CFA was conducted to estimate the ability of the indicators to measure the theorized risk facets. Initially, all of factor loadings that reflect individual risk

concepts were checked. An item in time risk was removed due to its loading below the cut-off value ( $TR_1 = 0.54$ ). All risk facets exhibited strong internal reliability as indicated by Cronbach's alpha. Average Variance Extracted (AVE) was estimated to check the convergent validity for eight latent constructs for risk facets and the values are compared with other constructs to assess discriminant validity. The results suggest that the individual reflective construct is distinct from other constructs in the measurement model. The squared AVE of each risk construct is also over 0.84, indicating that each of the latent variables explains its indicators more than the error variance, supporting convergent validity. Based on the correlation results, collinearity between security and privacy was identified ( $r = 0.93$ ). Therefore, the two constructs were combined into a single factor, namely privacy/security risk in the same line with Bhatnagar et al. (2000) and Kim et al. (2008). Composite reliability of all facets of perceived risk presents acceptable values.

Importantly, perceived risk has been theorized as a concept that consists of multi-dimensional constructs composing all of facets estimated above. In order to understand the underlying facets of this composite variable, the following section is to assess a second-order model of the risk construct. The various goodness-of-fit indices for CFA reasonably fit; the value of  $\chi^2/df$  (2.66) is lower than cut-off level of 3.00 (Kline, 2010),  $CFI = 0.92$  and  $TLI = 0.92$ , as well as  $RMSEA = 0.07$  and  $SRMR = 0.10$ . While the values of RMSEA are slightly higher than the recommended level ( $< 0.05$ ), Hu and Bentler (1999) suggested that error values below 0.10 are deemed acceptable. More specifically, the variance explained of 10.6 % for social risk implies that it is not important and salient. Additionally, the correlation values of social risk not only show inconsistent relationships with other constructs, they are also low in magnitude (i.e.,  $r < 0.16$ ). This finding is consistent with several previous studies in e-commerce and m-service adoption including Featherman and Pavlou (2003) and Luo et al. (2010). The findings also reveal that online travellers mainly consider performance risk in the system evaluation and purchasing tourism products. While physical risk ( $\beta = 0.68$ ,  $p < 0.001$ ) was not considered as important as performance risk, it is suggested that affect-based measurement that assess personal loss was insightful. Thus, further analysis includes physical risk, whereas social risk was eliminated. As a result, comparing the goodness-of-fit to the original model (first-factor model), all indices were improved:  $\chi^2/df = 2.70$ ,  $CFI = 0.94$ ,  $TLI = 0.93$ ,  $RMSEA = 0.06$  and  $SRMR = 0.05$ . In particular, the values of AIC show that the revised model ( $AIC = 24,556.31$ ) demonstrates a better fit than the original model ( $AIC = 27,921.52$ ). Therefore, the removal of social risk forms perceived risk in a better way.

### 4.2 Stage 2: Estimating Antecedents to and Consequences of Perceived Risk

Figure 1 presents the estimates obtained from the structural model using PLS analysis. The paths indicating perceived risk with seven risk facets are statistically significant ( $p < 0.001$ ), which assure the validation of the second-order model. In terms of antecedents, innovativeness ( $b = -0.19, p < 0.001$ ), trust ( $b = -0.33, p < 0.001$ ), and visibility ( $b = -0.10, p < 0.05$ ) negatively influence perceived risk, whereas collection ( $b = 0.20, p < 0.001$ ) positively so. The estimated antecedents explain about 34 % of variance for the perceived risk construct. With regard to consequences, perceived risk negatively influences attitude ( $b = -0.43, p < 0.001$ ), usefulness ( $b = -0.45, p < 0.001$ ), and intention to use smartphones ( $b = -0.42, p < 0.001$ ). Those three factors (i.e., attitude, usefulness and perceived risk) account for 38 % of variance for behavioural intention construct.

### 4.3 Common Method Bias

Podsakoff et al. (2003) suggests that common method bias tends to be more noticeable when data are obtained from the same respondents in the same measurement context utilizing the same items. This research conducted three steps to assess

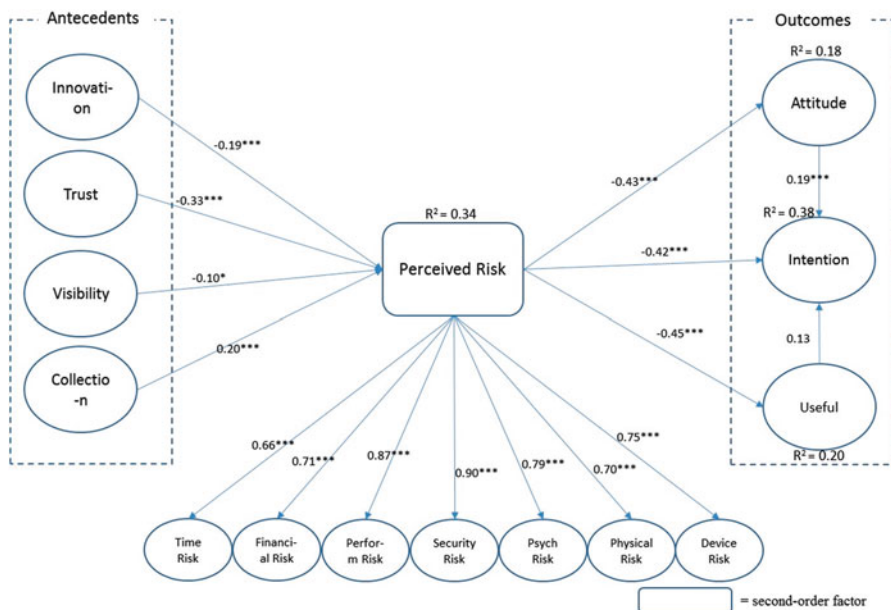


Fig. 1 The results of the proposed model of perceived risk

the potential errors in the model including Harman's single factor test, correlation matrix, and latent variable approach. The results reveal limited common method errors in the analytical model.

## 5 Conclusion and Implication

In light of the increasing prevalence of smartphones in daily and travel experiences, a low level of adoption of mobile travel booking signifies the importance of investigating the perceived risk that inhibits consumers from purchasing travel products through smartphones. Using data collected from travellers who are mobile phone users in China, this study tested and confirmed perceived risk associated with mobile travel booking as a multidimensional factor consisting of different risk facets. The results of this study demonstrate that perceived risk is a second order variable with significant paths to time risk, financial risk, performance risk, security risk, psychological risk, physical risk and device risk. Social risk, however, was excluded from the model because it indicated lack in salience. The results corroborate previous studies conceptualizing facet-based perceived risk (e.g., Featherman & Pavlou, 2003) and validate the inclusion of device risk into the model (e.g., Roehl & Fesenmaier, 1992; Sonmez & Graefe, 1998). Along with the high penetration of mobile phones in everyday life, the potential loss of their status within relevant community/society would not be critical to recent travellers who use their smartphones for a travel purpose. Importantly, the results suggest that consumers mainly regard security risk and performance risk (i.e., poor product quality) when evaluating mobile travel booking. This implies that concerns about privacy and security as well as the difficulty to judge the quality of travel products on smartphones (i.e., the chance of receiving inferior tourism products/services), contribute to the perception of risk associated with mobile travel booking.

Further, the results also confirm the antecedents of perceived risks, which include negative influences of consumer innovativeness, trust, and visibility, and positive influence of collection, in support of previous research (e.g., Aloudat et al., 2014; Cheung & Lee, 2000; Conchar et al., 2004; Dholakia, 2001; Dowling & Staelin, 1994; Junglas & Spitzmuller, 2005; Kim et al., 2008). Consumer innovativeness traits, which are associated with risk-taking tendency, are confirmed to reduce consumer perception about risk. Similarly, the higher consumers trust the mobile booking systems (i.e., vendors, technology), the less they view mobile purchases as risky. Consistent with the suggestion regarding adoption of innovation with a higher visibility, the results of this study also show that the ability of consumers to observe the application and/or outcomes of mobile booking systems for tourism (e.g., people around them are using it) reduces perceived risk. It is noteworthy that as an inhibitor of perceived risk, trust has the biggest influence in magnitude compared to the other, making it an important aspect to consider when designing mobile booking systems. Lastly, the more consumers perceived that

smartphones are automatically collecting personal information, the more they perceive risk associated with mobile booking.

The results also confirmed the consequences of perceived risk, which include perceived usefulness of smartphones for mobile booking (i.e., a positive evaluation of the systems), attitude toward mobile travel booking, and behavioural intention associated with purchasing travel products using smartphones (in support of, e.g., Gefen, Karahanna & Straub, 2003; Featherman & Pavlou, 2003; Jarvenpaa et al., 1999; Lu et al., 2005). Perceived usefulness and attitude also contribute positively to behavioural intention, which, together with perceived risk, explain 38 % variance in behavioural intention. The negative influence of perceived risk on evaluation and behavioural intention verifies the importance of reducing and/or eliminating perceived risk in order to increase adoption of smartphones for travel booking. This generates important implications for service providers and vendors (e.g., hotels) as well as designers of mobile application to target the antecedents that help reduce perceived risk. This could be done by promoting the inhibitor factors (innovativeness, trust, visibility) and repressing the promoter of perceived risk (collection). While innovativeness traits are linked to personal characteristics of consumers and imply targeting certain market segments that are prone to adopting new things, service providers and technology designers can increase trust and visibility by making the processes and outcomes associated with mobile travel booking more easily accessible for consumers. For example, for new applications, an easy-to-follow instruction in contexts relevant to consumers (e.g., using first-person-view videos or personas that consumers can associate themselves with) with an explanation on support processes that are not apparent (i.e., back-end) will assist with observability of the applications. Further, as the applications are used by early adopters, it is important to showcase the positive outcomes to support outcome demonstrability (e.g., by highlighting positive reviews and/or testimonials at point of sale). Demonstrating the positive outcomes of mobile travel booking will also increase trust (i.e., that vendors provide products and services at or above the expected level of quality), which, in turn, will reduce perceived risk. Additionally, assuring consumers that sensitive information are only collected to better understand their needs and preferences in order to personalize the services offered and clarifying the parties who have access to these information will also assist in reducing perceived risk.

While this research contributes to a better conceptualization of facet-based perceived risk in mobile travel booking context, it does not provide an alternative explanation regarding the intricacies of the relationships between perceived risk and its antecedents. For example, multiple studies tested different relationships between perceived risk and trust in terms of where the influence originates from (i.e., antecedents vs. consequences). While the conceptual model in this study was developed following a validated framework, future studies verifying different models will provide further support for the theorizing of perceived risk. Additionally, the antecedents included in the model are not expected to be inclusive of all possible factors, especially with regards to consumption contexts. Future research



should consider other factors that may contribute to increasing or reducing perceived risk in different consumption situations across different tourism destinations.

## References

- Aldás-Manzano, J., Lassala-Navarré, C., Ruiz-Mafé, C., & Sanz-Blas, S. (2009). The role of consumer innovativeness and perceived risk in online banking usage. *International Journal of Bank Marketing*, 27(1), 53–75.
- Aloudat, A., Michael, K., Chen, X., & Al-Debei, M. M. (2014). Social acceptance of location-based mobile government services for emergency management. *Telematics and Informatics*, 31, 153–171.
- Anuar, F. I., & Gretzel, U. (2013). Privacy concerns in the context of location-based services for tourism. *e-Review of Tourism Research*, 2013.
- Bhatnagar, A., Misra, S., & Rao, H. R. (2000). On risk, convenience, and internet shopping behavior. *Communications of the ACM*, 11, 98–105.
- Brislin, R. (1986). The wording and translation of research instruments. In W. Lonner & J. Berry (Eds.), *Field methods in cross-cultural research*. Newbury Park, CA: Sage.
- Bromiley, P., & Curley, S. P. (1992). Individual differences in risk taking. In F. F. Yates (Ed.), *Risk taking behavior* (pp. 87–132). Chichester, UK: Wiley.
- Chang, H. H., & Chen, S. W. (2008). The impact of online store environment cues on purchase intention. *Online Information Review*, 32(6), 818–841.
- Cheung, C., & Lee, M. K. O. (2000). Trust in internet shopping: a proposed model and measurement instrument. In *Proceedings of the 6<sup>th</sup> Americas Conference on Information Systems* (pp. 681–689).
- China Internet Watch (2015). *More Chinese Travelers Active on Mobile than PC*. <http://www.chinainternetwatch.com/15053/mobile-tourism-apps-users-pc/>
- Conchar, M. P., Zinkhan, G. M., Peters, C., & Olavarrieta, S. (2004). An integrated framework for the conceptualization of consumers' perceived-risk processing. *Journal of the Academy of Marketing Science*, 32(4), 418–436.
- Crespo, A. H., del Bosque, I. R., & de los Salmones, M. M. G. (2009). The influence of perceived risk on internet shopping behavior: A multidimensional perspective. *Journal of Risk Research*, 12(2), 259–277.
- Cunningham, L. F., Gerlach, J. H., Harper, M. D., & Young, C. E. (2005). Perceived risk and the consumer buying process: Internet airline reservations. *International Journal of Service Industry Management*, 16(4), 357–372.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003.
- Deutch, M. (1960). Trust, trustworthiness and the F scale. *Journal of Abnormal and Social Psychology*, 61(1), 138–140.
- Dholakia, U. M. (2001). A motivational process model of product involvement and consumer risk perception. *European Journal of Marketing*, 35(11/12), 1340–1362.
- Donthu, N., & Garcia, A. (1999). The Internet shopper. *Journal of Advertising Research*, 39(3), 52–58.
- Dowling, G. R., & Staelin, R. (1994). A model of perceived risk and intended risk-handling activity. *Journal of Consumer Research*, 21, 119–134.
- eRevMax (2014). eRevMax shares key insights on Chinese Travel Industry. <http://www.erevmax.com/ratetiger-news/infographic-chinese-travel-industry.html>
- Expedia Media Solution. (2014). The mobilized travel consumer—Insights to optimize your mobile strategy. White Paper.

- Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. *International Journal of Human-Computer Studies*, 59(4), 451–474.
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27(1), 51–90.
- Gefen, D., Rao, V. S., & Tractinsky, N. (2003). *The conceptualization of trust, risk, and their relationship in electronic commerce: The need for clarifications*. In Proceedings of the 36th Hawaii International Conference on Systems Sciences (HICSS) 2003.
- Hirunyawipada, T., & Paswan, A. K. (2006). Consumer innovativeness and perceived risk: implications for high technology product adoption. *Journal of Consumer Marketing*, 23(4), 182–198.
- Hu, L., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Jacoby, J., & Kaplan, L. B. (1972). The components of perceived risk. In M. Venkatesan (Ed.), *Proceedings of the Third Annual Conference of the Association for Consumer Research* (pp. 382–393). Chicago, IL: Association for Consumer Research.
- Jarvenpaa, S. L., & Todd, P. A. (1996). Consumer reactions to electronic shopping on the World Wide Web. *International Journal of Electronic Commerce*, 1(2), 59–88.
- Jarvenpaa, S. L., & Tractinsky, N. (1999). Consumer trust in an Internet store: A cross-cultural validation. *Journal of Computer Mediated Communication*, 5(2), 1–35.
- Jarvenpaa, S. L., Tractinsky, N., Saarinen, M., & Vitale, M. (1999). Consumer trust in an internet store: A cross-cultural validation. *Journal of Computer-Mediated Communication*, 5(2), 0.
- Junglas, I., & Spitzmuller, C. (2005). *A research model for studying privacy concerns pertaining to location-based services*. In Proceedings of HICSS'05, Hawaii, January 2005, (pp. 3–6).
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–291.
- Kim, M.-K., Chang, Y., Wong, S. F., & Park, M.-C. (2013). The effect of perceived risks and switching barriers on the intention to use smartphones among non-adopters in Korea. *Information Development*. doi:10.1177/0266666913513279.
- Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems*, 44, 544–564.
- Kim, L. H., Kim, D. J., & Leong, J. K. (2005). The effect of perceived risk on purchase intention in purchasing airline tickets online. *Journal of Hospitality & Leisure Marketing*, 13(2), 33–53.
- Kline, R. B. (2010). *Principles and practice of structural equation modeling*. New York: Guilford Press.
- Kuhlmeier, D., & Knight, G. (2005). Antecedents to internet-based purchasing: A multinational study. *International Marketing Review*, 22(4), 460–473.
- Lee, M. S. Y., McGoldrick, P. J., Keeling, K. A., & Doherty, J. (2003). Using ZMET to explore barriers to the adoption of 3G mobile banking services. *International Journal of Retail & Distribution Management*, 31(6), 340–348.
- Leung, L., & Wei, R. (1999). Who are the mobile phone have-nots? Influences and consequences. *New Media & Society*, 1(2), 209–226.
- Lim, N. (2003). Consumers' perceived risk: sources versus consequences. *Electronic Commerce Research and Applications*, 2, 216–228.
- Lu, H.-P., Hsu, C.-L., & Hsu, H.-Y. (2005). An empirical study of the effect of perceived risk upon intention to use online applications. *Information Management & Computer Security*, 13(2), 106–120.
- Luo, X., Li, H., Zhang, J., & Shim, J. P. (2010). Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: an empirical study of mobile banking services. *Decision Support Systems*, 46, 222–234.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20(3), 709–734.

- Mitchell, V. W. (1999). Consumer perceived risk: Conceptualisations and models. *European Journal of Marketing*, 33(1/2), 163–195.
- Mitchell, V. W., & Vassos, V. (1998). Perceived risk and risk reduction in holiday purchases: A cross-cultural and gender analysis. *Journal of Euromarketing*, 6(3), 47–79.
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192–222.
- Neuhofner, B., Buhalis, D., & Ladkin, A. (2014). A typology of technology-enhanced tourism experiences. *International Journal of Tourism Research*, 16, 340–350.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903.
- Ratnasingham, P. (1998). The importance of trust in electronic commerce. *Internet Research*, 8(4), 313–321.
- Roehl, W., & Fesenmaier, D. (1992). Risk perceptions and pleasure travel: An exploratory analysis. *Journal of Travel Research*, 30(4), 17–26.
- Rogers, E. M. (1995). *Diffusions of innovation*. New York: The Free Press.
- Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review*, 17(1), 9–38.
- Sonmez, S. F., & Graefe, A. R. (1998). Determining future travel behavior from past travel experience and perceptions of risk and safety. *Journal of Travel Research*, 37, 171–177.
- van der Heijden, H., Verhagen, T., & Creemers, M. (2003). Understanding online purchase intentions: Contributions from technology and trust perspectives. *European Journal of Information Systems*, 12, 41–48.
- Vishwanath, A., & Goldhaber, G. M. (2003). An examination of the factors contributing to adoption decisions among late-diffused technology products. *New Media & Society*, 5(4), 547–572.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387.
- Yang, Y., & Zhang, J. (2009). *Discussion on the dimensions of consumers' perceived risk in mobile service*. The Proceeding of 2009 Eighth International Conference on Mobile Business. Washington, DC: IEEE Computer Society, 261–266.
- Zaltman, G., Duncan, R., & Holbek, J. (1973). *Innovations and organizations*. New York: Wiley.

# Tracking Tourist Spatial-Temporal Behavior in Urban Places, A Methodological Overview and GPS Case Study

Lenka Kellner and Roman Egger

**Abstract** The tourism industry is inundated with tourists who have diverse profiles and choose to spend their time in different ways when visiting urban destinations. Understanding the so-called spatial-temporal behavior of tourists would include, a study of their movement within the space, the duration of time they spend at any given location and the services they utilize, all of which can provide valuable information not only to Destination Management Organizations, but also to all stakeholders involved in tourism businesses and the field of tourism research. While spatial-temporal behavior of tourists can be monitored and measured by several tracking methods, no general overview on the methodological approaches has been provided so far. Therefore, this research paper attempts to investigate and describe the possible tracking methods, while outlining the associated advantages and disadvantages of tracking tourist behavior in an urban place. Since using the Global Positioning System (GPS) has proven to be the most promising method in measuring tourist movement patterns in an urban destination, a case study undertaken in Salzburg City will highlight the benefits and limitations of using the GPS as a tracking technique. Understanding all the possible tracking methods and their advantages and disadvantages will serve as a theoretical basis for the future monitoring of tourist spatial-temporal behavior in urban destinations and allow researchers to select the appropriate approach for their project.

**Keywords** Urban Tourism • Spatial-temporal Behavior • Tracking Methods • GPS Tracking

## 1 Introduction

The tourism industry is considered to be one of the largest industries worldwide and the economic backbone for many countries. Within the last decades, traveling and tourism has become part of our everyday lives (Glaeser, 2006). For tourists, traveling or going on holiday allows them the opportunity of stepping out of their normal lives to explore unknown traditions and surroundings, granting them the

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exposure to different ways of life and culture (Glaeser, 2006). Urban destinations are particularly popular as tourist destinations, as it is not uncommon for tourists to take several short trips to cities over the course of a year (Becker, 2000).

The number of activities undertaken in urban destinations varies according to individual interest, one's length of stay at the given location and one's financial means (Shaw, Agarwal, & Bull, 2000). Walking, sightseeing, shopping, visiting museums, eating out at a local restaurant or other activities, are part of what is known to be urban tourism. It is therefore vitally important for the field of tourism to know, which places (businesses, restaurants, attractions, etc.) are visited by tourists at which times (seasons, periods of travel, duration of stay, etc.) and to uncover the reasons behind these decisions and if possible, to identify trends or sequences. Furthermore, knowing the factors that influence tourist mobility, can assist tourist information companies on how to optimally facilitate visits to these local attractions, a key strategy when it comes to visitor management.

Tourist mobility can be monitored by various methods in an urban place or a vacation destination (Shoval & Isaacson, 2007). For example, by using observational methods such as time-space budget techniques, video-based analysis, timing systems or GPS and mobile phones (Millonig & Gartner, 2008). The usage of GPS has proven to be beneficial in various tracking studies in the field of tourism and seems to be a popular tool in gathering tourist spatial-temporal data (Nielsen & Blichfeldt, 2009). Thus, the aim of this paper is to provide a general overview on the possibilities for tracking tourist activity, and to highlight the pros and cons of this tracking method, as illustrated by the implementation of a case study of GPS tracked tourists in Salzburg City, Austria.

## 2 Urban Tourism and the Need for Tracking Tourists

“Urban tourism is one among many social and economic forces in the urban environment. It encompasses an industry that manages and markets a variety of products and experiences to people who have a wide range of motivation, preferences and cultural perspectives and are involved in a dialectic engagement with the host community” (Edwards, Giffin, & Hayllar, 2008, p.1038). With regards to activities, the attractiveness of urban tourism lies in the huge variety of things to do and see in an interesting, compact and appealing environment (Karski, 1990).

The core concept of spatial-temporal behavior is to understand the general principles of the tourist's interactions with the environment and how tourists as a whole, act differently in specific types of locations at different times, for instance, in museums, shopping centers or restaurants (Lew, Hall, & Williams, 2004). Spatial behavior refers to patterns of movement typified by distances, origins, destinations, frequencies and directions (Lankford et al., 2004). More importantly, movement represents the act or process of moving, mainly when referring to a change of place or position (Merriam-Webster, 2015). Overall, the tourist's spatial behavior displays how tourists move within the built environment (Dejbakhs, 2008). The built

environment consists of both natural systems such as parks and rivers within urban environments and built structures such as buildings, entertainment complexes and shopping centers (Dejbakhsh, 2008).

However, why should we track the movements of tourists? What can be gleaned from the information gathered by monitoring spatial-temporal behavior of tourists in an urban area, and how can the results be subsequently utilized? The knowledge of the direction related to tourism flows and physical movement, might be essential for the evaluation of the impact of tourism and its externalities (Parrocco & De Cantis, 2012). According to MCKERcher and Lew (2006), understanding the spatial-temporal behavior of tourists in an urban area might serve as the basis for urban planning, product and image development as well as tourism management in terms of planning new attractions and managing the social, cultural and environmental impacts of tourism. Furthermore, redirecting visitor flows is important to avoid overcrowding, and to minimize the harmful effects on historical sites and more extensively, to distribute expected benefits (Richards & Musters, 2010).

In addition, the knowledge that comes from understanding tourist movements and their activities in an urban place can be utilized for creating customized products and services, such as packages or itineraries, that would bring additional benefits to the tourists and the destination (Zoltan, 2014). Furthermore, the knowledge of tourist mobility might be a valuable source of information for the optimization of the city infrastructure in general (Schlegel, 2015). Moreover, collating relevant data such as the duration of time tourists spend in the city center, can bring about the optimization of opening hours of information points, as well as to set tourist-friendly opening times for restaurants and shopping facilities.

Moreover, having records of the various nationalities of tourists coming to the destination, means that names of the streets and signs can be put up in the native language of the tourist and at information points in urban places, one can ensure that communication takes place in the most commonly used language (Schlegel, 2015). On top of that, the number of tourists as well as the profiles of tourists at a specific attraction in an urban place can be investigated. This kind of information can be interesting for all stakeholders who wish to provide products and services to tourists, who, based on the outcome of tracking data, might re-structure or re-conceptualize their businesses or even open up new ones in order to achieve success.

Thornton, Williams, and Shaw (1997) claim that results from tourist tracking studies might be valuable for transportation management, avoiding the risk of oversaturation and overcrowding at places of interest, optimizing routes as well as to better enhance marketing strategies targeted at meeting the needs of the given destination's visitors. Understanding exactly what streets were used for travelling around the city, questioning how many vehicles or people were present, for how long and with what effort, which attractions and facilities they went to, asking who visited the monument or the cathedral, as well as what types of shopping facilities and places in a city are of interest to visitors, could lead to important improvements in the quality of experience offered by an urban destination (Thornton et al., 1997). To conclude, the outcomes of tracking the tourist's spatial temporal behavior in an

urban place might be the starting point for new tourist site management scenarios on any spatial and temporal scale.

### 3 Comparison of Methods and Techniques Used for Tracking Tourists

As previously mentioned, different methods can be used for tracking tourist spatial-temporal behavior in urban areas. Based on the literature review, the following methods for tracking tourist spatial-temporal behavior can be used: observation, time-space budget techniques such as questionnaire surveys, interviews, self-administrated diaries, spatial maps, video-based tracking techniques, timing systems, mobile phones and GPS. All of the mentioned techniques have some advantages and disadvantages (Shoval & Isaacson, 2007).

Observation, interviews, questionnaire surveys and self-administrated diaries, were the first techniques used for tracking tourist mobility in urban places. Interviews, questionnaire surveys and self-administrated diaries are non-observational methods or so-called time-space budget techniques that systematically record a person's movement over a given period of time (Shoval & Isaacson, 2007). All of the mentioned techniques provide precise and detailed data, and have proven to offer a flexible tracking method. However, on the other hand, they are time-consuming, labor intensive and involve intrusive techniques.

Another approach for tracking tourist mobility are spatial maps, which are part of the time-space budget techniques (Millonig & Gartner, 2008). Spatial mapping is defined as the use of space for tracking referents, in order to obtain a "picture" of some real-world occurrence (Baker-Shenk, & Cokely, 1991; Klima, & Bellugi, 1979). This technique is simple to use, allows for flexibility and provides the researchers with precise information. Nevertheless, spatial mapping seems to have strong disadvantages on the other hand, as it is dependent on a small-scale map, which means there is often no interest from tourists to participate in such a study, as it is tiring and time-consuming for the participants to fill in all the relevant spatial-temporal data.

In terms of video-based tracking analysis, which is usually used for tracking tourist movements in a small environment, these are beneficial in recording precise tourist movements, capturing real-time video footage (Dejbakhsh, 2008). However, it might happen that the illumination changes can influence the quality of a video recording, and the software needed for the data analysis is expensive and difficult to use.

Furthermore, timing systems represent tools that have the ability to monitor the duration and location of tourist movement patterns by monitoring time and location on a micro level and in outdoor environments (O'Connor, Zerger, & Itami, 2005). Although timing systems are a relatively inexpensive technology, spatial-temporal data is not recorded, when a participant does not pass the static receiver. Another

drawback is that the battery has to be recharged quite often and expensive software has to be installed in order to proceed with data analysis.

Mobile phones as a tracking technology for measuring tourist mobility can be obtained in two dimensions (Asakura & Hato, 2004). Firstly, cellular phones based on PHS, PDA or GPS can observe tourist mobility. These particular technologies, however, have some disadvantages: mobile phones have to be connected to antennas, they can measure tourist movements only on urban or regional levels and they might lose signal in some buildings. Secondly, smartphones are becoming more interesting for researchers as of late (Seepold, 2015). Although the mobile phone technique provides accurate and personalized data about tourist spatial-temporal behavior, the method has the disadvantage of being energy-consuming and thus limited in terms of time, as the battery on a smartphone lasts for only approximately 2–3 h and a mobile phone also needs to be recharged often.

Last but not least, tourists can be tracked by GPS technology as well (Shoval & Isaacson, 2007). Tourists are simply given a small GPS tracker/logger that should be carried with them throughout their stay in an urban destination. The method is beneficial for acquiring accurate spatial-temporal data; it is relatively inexpensive, as only renting fees of the devices need to be paid, less labor intensive and efficient in large metropolitan areas (Shoval & Isaacson, 2007). For example, the tracking study conducted by GPS technique measures and stores the tracking data automatically by using special softwares, the researcher does not have to observe a tourist personally and the GPS allows for 10 or 11 h monitoring data per day Millonig and Gartner (2008). Although the GPS has some drawbacks, such as ethical issues related to the invasion of privacy, loss of signal in particular buildings, and the need for subsequent highly complex data analysis; in comparison to all other methods, it seems to be the most appropriate tool for tracking tourists nowadays. Therefore, a case study involving GPS tracking was conducted in Salzburg City.

## 4 Case Study: GPS Tracking Tourists in Salzburg City

As GPS tracking seems to be the state of the art choice, this case study intends to examine its benefits and limitations for tracking spatial-temporal behavior of tourists.

The GPS tracking took place in Salzburg City, Austria, where the old city of Salzburg has been designated as a UNESCO World Cultural Heritage Site (Visit-Salzburg, 2015). One of the most attractive selling points to tourists is that Salzburg happens to be the birthplace of the famous composer Wolfgang Amadeus Mozart, in addition to hosting the world famous Salzburg Festival every summer and having been a backdrop to the Sound of Music movie that was filmed in the region.



## 4.1 *Data Collection*

The sampling of the study was done in the Youth Hostel YOHO in Salzburg City. The reason for choosing this specific hostel was its close proximity to the city center, the interest of the hostel management over the process of the data collection, as well as hostel's diversity of guests. Tourists were approached during breakfast time and in the afternoon, while queuing for check-in in the lobby of the hostel. They were asked whether they would be interested in carrying a GPS tracker for one day only. When approached, participants were informed about the aim of the research, about the author's identity and possible risks associated with the research. The tourists were also informed about the technological and ethical issues regarding the research. Moreover, to minimize the unlikely probability of a participant destroying or losing the device, all participants were asked to sign the participation agreement on returning the GPS logger back to the researcher or to the front desk of the hostel.

## 4.2 *Questionnaire Data Collection*

As Millionig and Gartner (2008) claimed in their study that GPS technology records only spatial and temporal information, an online-questionnaire was developed in order to understand who the participants were and what their intentions for visiting Salzburg City were. In total, 61 tourists participated in the study. The questionnaire compiled data such as gender, age, nationality, highest degree of education completed, marital status and current professional status. Furthermore, questions related to the purpose, duration of the stay, first time or repeat visit, the planned places/attractions visited and with whom the respondents were travelling with, were asked in the questionnaire too. The most significant results of the questionnaire are presented in the Table 1.

It can be seen from the Table 1 that the highest number of the respondents were young tourists aged between 15 and 25 (72.1 %), a significant proportion were from the USA (26.2 %), most of them were single (93.4 %), the majority were visiting Salzburg City for the first time (95.1 %) and almost all tourists stayed in the city for less than one week (98.4 %).

Spatial and temporal data were measured using ArcGis, QGIS and Webmap software. The ArcGis software was used especially for the analysis of places visited in Salzburg City. This helped to identify the areas that presented the most and least level of interest to the tourists, as well as ascertained which tourist attractions recommended by the Tourism Board were the most and the least popular. The QGIS (Quantum Geographic Information Software) software enabled the visualization, management, editing, data analysis and composition of various data on various types of maps (Geocommunity, 2008), which was helpful for this study, since the heat maps describing the concentration of tourists in Salzburg City could

**Table 1** Overview of methods and its advantages and disadvantages

Method	Advantages	Disadvantages
Observation	<ul style="list-style-type: none"> <li>• Precise and detailed data</li> <li>• Can obtain non-spatial data of tourists</li> <li>• Possibility to track tourists more flexibly</li> </ul>	<ul style="list-style-type: none"> <li>• Time-consuming</li> <li>• Low-sample size</li> <li>• Labor intensive</li> <li>• Intrusive</li> <li>• Ethical Issues</li> </ul>
Interviews	<ul style="list-style-type: none"> <li>• Deep and detailed information about spatial behavior</li> <li>• More flexible in gathering data</li> </ul>	<ul style="list-style-type: none"> <li>• No interest, patience of tourists in taking part</li> <li>• Loss of memory in the specific activities done in the city</li> <li>• Time-consuming</li> </ul>
Questionnaire surveys	<ul style="list-style-type: none"> <li>• Relatively inexpensive</li> <li>• Large-sample size</li> <li>• Detailed spatial information</li> </ul>	<ul style="list-style-type: none"> <li>• Not relevant data provided by tourists because of no interest, loss of memory or no patience</li> <li>• Time-consuming</li> <li>• Intrusive</li> </ul>
Self-administered diaries and Spatial maps	<ul style="list-style-type: none"> <li>• Simple method</li> <li>• Excellent details on tourist's spatial behavior</li> <li>• High flexibility</li> </ul>	<ul style="list-style-type: none"> <li>• Intrusive</li> <li>• Dependence on small scale maps</li> <li>• Loss of some tracking data due to the tourist's inattention</li> <li>• No interest from the participant side on the survey participation</li> <li>• Tourist concentration on filling in the map while being on holiday</li> <li>• Tiring, disruptive</li> <li>• Time-consuming</li> </ul>
Videos	<ul style="list-style-type: none"> <li>• Micro-level movements</li> <li>• Records illustrated by photos</li> <li>• Precise documentation</li> <li>• Real-time video footage</li> <li>• Automatic evaluation of real-time tourist's routes</li> <li>• Automatic counts of tourists</li> </ul>	<ul style="list-style-type: none"> <li>• Illumination changes might have a negative impact on the video quality</li> <li>• Technological problems might occur</li> <li>• The need of an analysis software</li> <li>• Low quality of a record</li> <li>• Difficulties with an analysis</li> <li>• Expensive software</li> <li>• Ethical issues</li> </ul>
Timing systems	<ul style="list-style-type: none"> <li>• Time and location data monitoring</li> <li>• Micro-level tourist mobility</li> <li>• Large sample size</li> <li>• Inexpensive</li> <li>• Ideal for outdoor tracking</li> </ul>	<ul style="list-style-type: none"> <li>• No data recorded if tourists don't pass the receiver</li> <li>• Limitation of battery life and data logger memory capacity</li> <li>• Expensive software</li> </ul>
Mobile phone	<ul style="list-style-type: none"> <li>• Personalization</li> <li>• Providing information about position and services in certain locations</li> <li>• The signal strength</li> <li>• Additional information on tourist's preferences and decisions provided</li> <li>• Simplicity in usage</li> </ul>	<ul style="list-style-type: none"> <li>• The need of connection to base stations</li> <li>• Possibility of usage only on urban/regional level</li> <li>• Loss of signal in some buildings</li> <li>• Time-consuming</li> <li>• Low-battery life</li> <li>• Ethical issues</li> </ul>

(continued)

**Table 1** (continued)

Method	Advantages	Disadvantages
GPS	<ul style="list-style-type: none"> <li>• Accuracy</li> <li>• Inexpensive</li> <li>• Collection of data for longer period of time</li> <li>• Easy to record/store data</li> <li>• Less labor intensive</li> <li>• Efficiency in large urban areas</li> <li>• Possibility of linking to photo-making</li> <li>• Sustainability</li> <li>• Possibility of tracking in various fields (theme parks, mountain resorts...)</li> <li>• Mature technology</li> <li>• High resolution</li> </ul>	<ul style="list-style-type: none"> <li>• Ethical issues</li> <li>• Loss of signal in some buildings</li> <li>• No information on demographic data</li> <li>• The need to recharge batteries during night when using the device the following day</li> <li>• Too complicated analysis of recorded trajectories</li> <li>• Risk of loosing the GPS equipment</li> </ul>

be created. Last but not least, the temporal (speed) data was aggregated and analyzed in the software called Webmap.

## 5 Findings and Results of the Case Study

The case study has dealt with understanding the advantages and disadvantages of GPS as a tracking methodology for acquiring tourist spatial-temporal behavior in an urban place. In terms of advantages, the GPS technique is effective from a timesaving perspective, since a researcher and a participant have less work with filling in the required data, in comparison with other tracking methodologies. Moreover, tracking by GPS technology allows a researcher to track a tourist for around 8 h a day, which is significantly more than what observation or time-space budget techniques allow. In contrast to other tracking methodologies mentioned in the theoretical part of this paper, the GPS technique is not expensive, since most of the data collection and data analysis are computed. Finally, it has been established that the GPS technology also works well in mountains, parks and in areas surrounding lakes. It manages to collect all relevant data for the tracking purposes not only in urban areas but also outside the city, such as in Alpine ranges, or in mountainous areas next to the lakes.

Furthermore, the GPS technology has the ability to identify an object (point of interest) in an urban destination, position of a tourist, distance undertaken by a tourist during the time given whilst carrying a GPS tracker, direction of a movement and sequence of itinerary (the order in which a tourist visits a number of points of interests). Interestingly, thanks to ArcGis and QGIS software, the data collected from the GPS technology can be aggregated. For instance, the number of tourists visiting certain tourist attractions can be monitored. The Fig. 1 below demonstrates

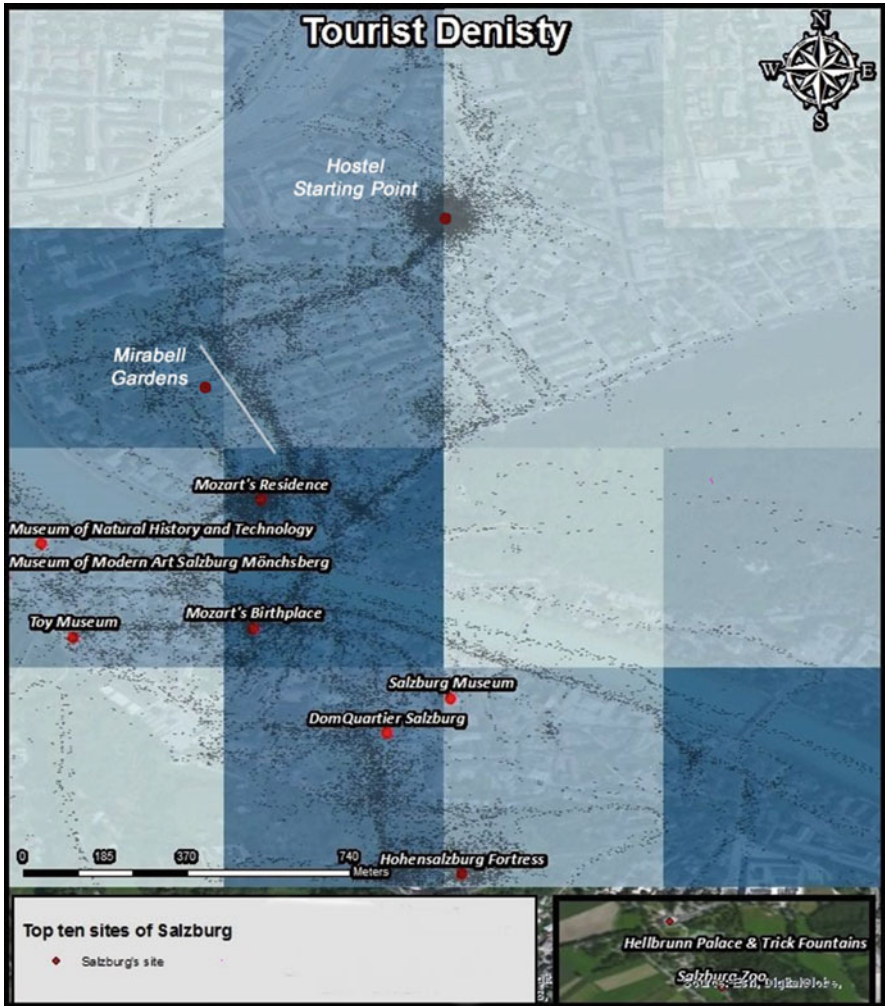


Fig. 1 Tourist density in Salzburg City

the density/concentration of all tourists carrying the GPS tracker during the case study.

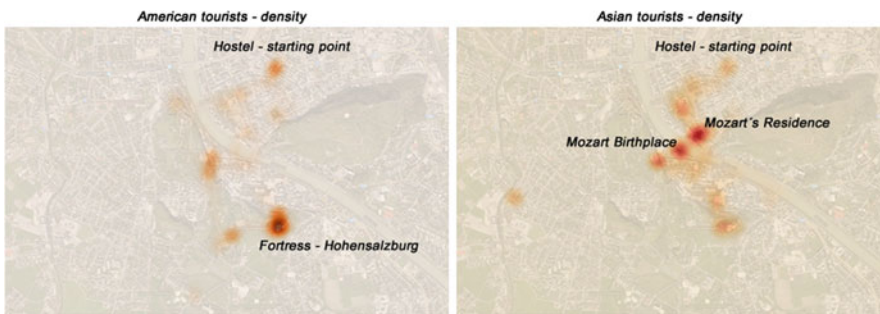
The figure presents the different areas of tourist density by implementing different colors, varying from lighter grids to darker ones. In addition, the lighter color stands for the area of Salzburg City that was less visited by tourists and the darker colored grids/areas represent places, which were visited more frequently by tourists. The black points on the map represent waypoints of all 60 participants carrying the GPS loggers. It is evidently seen from the figure that the most visited areas (the darkest squares) in the city are places where Mozart's Birthplace and Mozart's Residence are situated. Interestingly, the most popular area which all

60 participants visited, was the Mirabel Gardens. However most tourists stayed outside the gardens or walked along the exterior (see white line—most people walk on the street on the east-side outside the gardens). A clear indication whereby visitor orientation can be improved, more signs are needed to direct visitors into the gardens. Furthermore, the third most frequented area seems to be the bottom right hand corner of the grid. It supposedly represents the tourists' movement to other attractions, which are situated to the south, such as Hellbrunn Palace and the Trick Fountains, or even just to walk along the river and enjoy the promenade. It is also important to mention that tourists were frequently moving within the area around the hostel, since it was their starting point of the tracking study.

On top of that, the QGIS provides an excellent tool for comparing the individual tracks or routes of certain groups of tourists. In other words, the software has the ability to show for example, the spatial behavioral differences between females and males, between various nationalities, as well as between different age groups or other variables. With regards to the density analysis, the heat maps of all or various types of visitors' movement patterns can be undertaken too.

For instance, Fig. 2 shows two different heat maps demonstrating the areas with the highest concentration of tourists and the least visited areas by American and Asian tourists. The places with a high density of tourists are demonstrated by various colors, from the lighter spots characterizing the least visited places, to the darkest spots indicating which were the most visited areas. For example, it can be clearly seen from the figures below, that the tourist movement patterns vary among nationalities. While American tourists spent most of their time during the day in the Hohensalzburg Fortress, the Asian visitors tend to spend more time in Mozart's Residence and in the area of the river promenade.

Furthermore, the speed at which the tourists made their way around the city was analyzed too. The knowledge of speed can be a valuable indicator of boring and interesting places in an urban area. For instance, if tourists move faster and walk past an interesting attraction or cultural heritage point, it can be assumed that they are not interested in the site or significantly, there may be no visible signage pointing to it. Therefore, with the knowledge of the speed at which tourists travel, the attraction management, as well as the signage for tourist sights can be improved.



**Fig. 2** The density of American and Asian tourists in comparison in Salzburg City

The examination was conducted with a software called Webmap. The average speed of tourists is visualized in colors by the software; varying from light yellow, which indicates that the average speed of a person is between 0 and 2 km/h, to dark red, which shows the average speed of a tourist moving around at more than 15 km/h. For instance, Fig. 3 represents the different speed results of female participants. In the software, the average speed of tourists is displayed at the bottom of the figure, which then pops up when moving a mouse cursor over the tracks loaded in the map.

GIS-Tools also allows for the accumulation and aggregation of geo-spatial data to create video animation (as presented via the QR-Code of Fig. 4), in order to analyze patterns related to the actual physical movements of tourists.

However, the GPS devices that were used for the case study conducted in Salzburg City revealed some inaccurate data and disadvantages. The system recorded the wrong position, distance and speed of some tourists, and for a number of the participants, the technology tended to malfunction several times during the

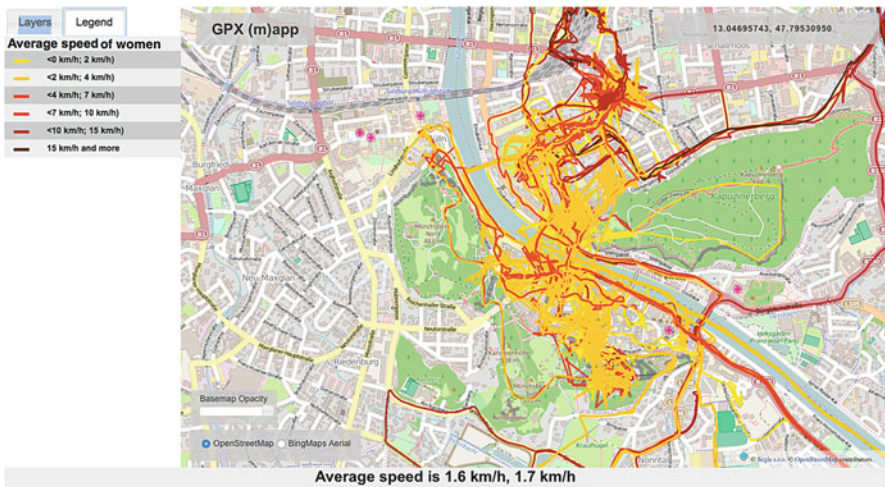


Fig. 3 Average speed of females in Salzburg City



Fig. 4 Link to video animation



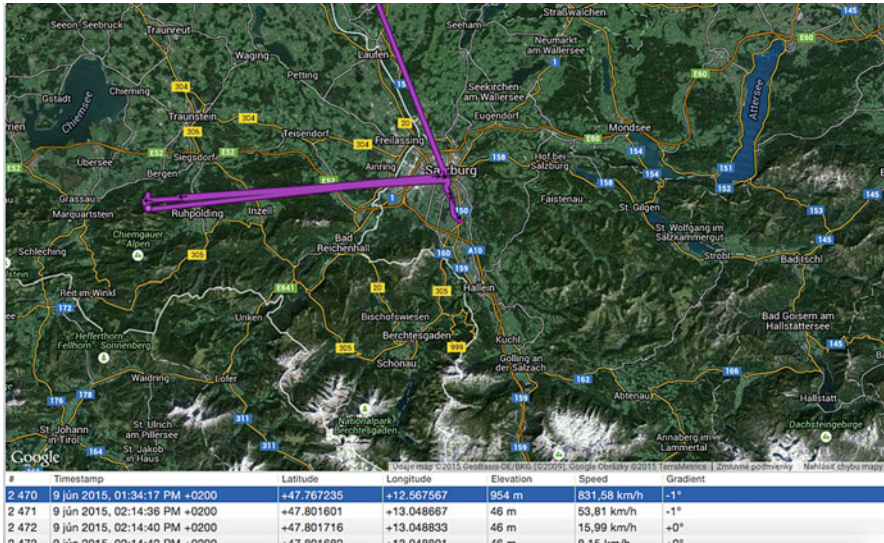


Fig. 5 An example of inaccurate tourist’s trajectory

day, and thus the waypoints of a few tourists were missing. For instance, Fig. 5 shows two straight lines on the map, the one going to the left and the other one pointing upwards in the figure.

GPS data analysis can easily become quite complex and GIS-knowledge is needed. As GPS logging does not provide the answer to who is being tracked and does not give insights into the motivations behind why one visits certain points of interests, a mixed method approach is needed. These questions can only be answered by implementing questionnaires, or by engaging the participant in an interview. Furthermore, it seems to be interesting to combine GPS tracking with an ethnographic approach. In this case study, the online self-completion questionnaire worked well, since tourists are not interested in spending their valuable time during a vacation, on interviews. Last but not least, the GPS technology observes and follows tourists’ steps; therefore some participants might have the feeling of having their privacy invaded when carrying a GPS logger. For that reason, a detailed explanation of possible ethical issues should be given to tourists, as well as a demonstration of how to operate the given GPS device in case a tourist would like to turn the tracker off, while being observed.

## 6 Conclusion, Limitations and Recommendations for Future Research

Many researchers have shown an interest in investigating the spatial-temporal behavior of tourists in urban places, since this type of information serves as a valuable source for all stakeholders involved in the tourism industry (MCKercher & Lew, 2006). The spatial-temporal behavior of tourists in urban places can be examined by using so-called tracking methodologies (Millonig & Gartner, 2008). However, no essential overview of the possible methods and techniques for obtaining tourist mobility data in urban destinations has been provided so far. Thus, the aim of this paper was to identify possible methods and techniques for tracking tourist spatial-temporal behavior in urban places and to describe their advantages and disadvantages. Overall, this paper should act as a useful source of information when deciding on the type of tracking methodology to use and also as a guideline for future researchers and students conducting a tracking study involving GPS technology.

This study also had to deal with a number of limitations. First and foremost, the examination of all existing tourist tracking methods focused predominantly on urban destinations. Even though there was the intention of covering a wide range of tracking methods to study tourist spatial temporal behavior in various fields, this is of course, very time consuming and could only be achieved to some extent. Therefore, future research on possible tracking methods for acquiring tourist movement patterns could be centred on rural areas, national parks, theme parks, skiing resorts, cruise liners, airports, train stations, shopping malls or any other places affected by tourism. Additionally, the empirical part of this paper focused only on the GPS method as a tracking instrument for obtaining data on tourist spatial-temporal behavior in Salzburg City. However, it could be interesting to examine all the above mentioned tracking techniques in order to come to an up-to-date conclusion on advantages and disadvantages of those methods too.

Some limitations occurred during the case study too. Firstly, the results of the GPS tracking research cannot be generalized due to the small sample size under consideration. In order to extrapolate more general results from the tracking data and its relationship to Salzburg City, a larger, representative sample should be obtained. Furthermore, only tourists staying in the same hostel were given a GPS tracker for tracing their movement, which resulted in tourists generally using the same streets to get to the city center and to come back to the hostel. The aim of the GPS case study was to get insights into this methodology and not to gather data for analyzing tourism geo-spatial behavior in Salzburg. Therefore, the next GPS tracking study should try to analyze the physical behavior and movement of tourists in greater detail (eg. moving patterns depending on the utilized information; guidebooks, official tourist information, internet etc.) - and therefore use several hotels as starting points, in order to compare and contrast movement patterns between various groups of tourists.



## References

- Asakura, Y., & Hato, E. (2004). Tracking survey for individual travel behaviour using mobile communication instruments. *Transportation Research Part C: Emerging Technologies*, 12(3-4), 273–291.
- Baker-Shenk, C. L., & Cokely, D. (1991). *American Sign Language: A teacher's resource text on grammar and culture*. Washington, DC: Gallaudet University Press.
- Becker, C. (2000). *Freizeit und Tourismus in Deutschland*. Nationalatlas der Bundesrepublik Deutschland, 10.
- Dejbakhsh, S. (2008). *Determining the Spatial Needs of International Tourists*. Victoria (MA): RMIT University Melbourne.
- Edwards, D., Giffin, T., & Hayllar, B. (2008). Urban tourism research: Developing and agenda. *Annals of Tourism Research*, 35(4), 1033–1052.
- Geocommunity (2008). *Quantum GIS software: Application user review*. [WWW] Available from: <http://spatialnews.geocomm.com/articles/qgisreview/> [Accessed 27/06/2015].
- Glaeser, D. (2006). *Crisis management in the tourism industry*. London: Routledge.
- Karski, A. (1990). Urban tourism: A key to urban regeneration. *The Planner*, 76(13), 15–17.
- Klima, E., & Bellugi, U. (1979). *The sign of language*. Cambridge, MA: Harvard University Press.
- Lankford et al. (2004). Cognitive mapping: An application for trail management. In: *Proceedings of the 2004 Northeastern Recreation Research Symposium* (pp. 378–384).
- Lew, A., Hall, C. M., & Williams, A. (2004). *Companion to tourism*. Oxford: Blackwell Publishers.
- MCKercher, B., & Lew, A. (2006). Modeling tourist movements: A local destination analysis. *Annals of Tourism Research*, 33(2), 403–423.
- Merriam-Webster (2015). [WWW]. *Merriam-Webster Online Language Center*. Available from: <http://www.m-w.com> [Accessed 30/05/2015].
- Millonig, A., & Gartner, G. (2008). *Exploring human spatio-temporal behavior patterns*. Workshop on Behaviour Monitoring and Interpretation BMI '08 in Conjunction with 31st German Conference on Artificial Intelligence, Kaiserslautern.
- Nielsen, N. C., & Blichfeldt, B. S. (2009). Where do they go? Monitoring tourist mobility at the destination. In: *18th Nordic Symposium in Tourism and Hospitality Research*. University of Southern Denmark.
- O'Connor, A., Zerger, A., & Itami, R. (2005). Geo-Temporal tracking and analysis of tourist movement. *Mathematics and Computers in Simulation*, 69(1–2), 135–150.
- Parrocco, A. M., & De Cantis, S. (2012). Multi-destination trips and tourism statistics: Empirical evidences in Sicily. *Econoemics*, 6(44), 1–28.
- Richards, G., & Musters, W. (2010). *Cultural tourism research methods*. Wallingford: CABI Publishing.
- Schlegel, V. (2015). *BigData Services: The mobile revolution in tourism: What are and will be the factors of success?* [online video]. ENTER 2015 eTourism Conference-1st Keynote Session (2015). Available from: <https://www.youtube.com/watch?v=6yo1K71pQ4> [Accessed 05/07/2015].
- Seepold, R. (2015). *Follow the main routes of tourists*. Ubiquitous Computing Laboratory. [WWW]. Available from: <http://uc-lab.in.htwg-konstanz.de/news/405-follow-the-main-routes-of-tourists.html> [Accessed 20/06/2015].
- Shaw, G., Agarwal, S., & Bull, P. (2000). Tourism consumption and tourism behaviour: A British perspective. *Tourism Geographies*, 2(3), 264–289.
- Shoval, N., & Isaacson, M. (2007). Tracking tourists in the digital age. *Annals of Tourism Research*, 34(1), 141–159.
- Thornton, P., Williams, A., & Shaw, W. G. (1997). Revisiting time-space diaries: An exploratory case study of tourist behavior in Cornwall, England. *Environment and Planning A*, 29, 1847–1867.
- Visit-Salzburg (2015). Salzburg, where the hills are alive. [WWW]. Available from: <http://www.visit-salzburg.net/general-info.htm> [Accessed 21/06/2015].
- Zoltan, J. (2014). *Understanding tourist behavior in terms of activeness and intra-destination movement patterns for managing tourism experience*. Unpublished thesis (PhD), Università della Svizzera italiana.

# Users' Creativity in Mobile Computing Travel Platforms

Lidija Lalicic and Astrid Dickinger

**Abstract** Web 2.0 code-free interfaces and mobile computing platforms allow consumers to creatively create content and share with their peers. As a result, numerous user-driven innovation-oriented communities started to emerge. Nowadays, these communities are available through smartphones. Especially in the field of tourism these platforms started to reshape marketing practices as well as tourist' behaviour. Therefore, this study analysed a mobile computing travel platform by integrating creativity theory and platform engagement to explain this phenomenon. First, the study demonstrates users' innovative traits influencing their online behaviour. Second, for marketers this study illustrates the importance of an effective working environment to support consumers producing user-driven innovate as well as the opportunities to attract highly innovative users.

**Keywords** Creativity • Mobile computing platforms • User-driven innovations • Travel journals

## 1 Introduction

Web 2.0 has broadened the information access and the ability to produce content through simple code-free interfaces (Labrecque, vor dem Esche, Mathwick, Novak, & Hofacker, 2013). Consumers can constantly update and share their content in social media spaces. On top of that, the development of smartphones and mobile computing platforms allow consumers to share and create at any given time. According to Dawson and Andriopoulos (2014) every online contribution by consumers can be perceived as a form of innovation. Richardson, Third, and MacColl (2007) claim that these rapid ICT developments triggered a shift from the traditional analogy paradigm to the user-driven innovation paradigm. Hjalager and Nordin (2011) refer to the concept of user-driven innovation as consumers creating and innovating their own products driven by their needs, feelings of curiosity, enjoyment, creativity and locus of control (Von Hippel, 2007). Currently, many varieties of user-driven innovative behaviour are being conducted and shared

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by consumers in Web 2.0 spaces. Examples are written reviews, rating peers reviews, posting photographs and the maintained specialized blogs (Kozinets, Hemetsberger, & Schau, 2008). Thus, Web 2.0 interfaces make consumers creative agents participating in the co-production of their own value (Kozinets et al., 2008; Von Hippel, Ogawa, & de Jong, 2011). Moreover, there is a growing trend of innovation-oriented peer-to-peer communities (Kozinets et al., 2008). Interestingly, the creative contributors of these user-driven innovative communities are a minority among the vast group of members seeking information. There are only a small number of community members very knowledgeable, highly skilled, and able to create their own virtual products with an impressively high quality and level of innovation (Füller, Jawecki, & Muhlbacher, 2007; Von Hippel, 2007). Nielsen (2006) proposes the 90-9-1 rule, illustrating that 90 % of the users only reads the online content creation and never contributes, 9 % of the users contributes occasionally and 1 % actively creates content. The minority of users are, thus, active contributors, who put in a certain amount of creative effort created outside professional routines and platforms (Van Dijck, 2009). Moreover, these users have an impact on their peers, but they also succeed in new marketing practices related to their content (Seraj, 2012). Especially in tourism this trend is apparent, given the numerous highly specialized travel blogs and user travel communities where tourists actively meet and share. Moreover, the various mobile computing platforms help tourists on the go to stay connected to home, report on their trip and/or search for advice from their peers (Lamsfus, Wang, Alzua-Sorzabal, & Xiang, 2014).

Despite the pertinent role of ICT and mobile devices that enable creativity, it is a relatively new and largely unexplored avenue of research (Edmonds et al., 2005). Tourism research has started to categorize the motivations of online content creators, the different types of content created and the influence of online social identity and personality traits on the content created (Bronner & De Hoog, 2013; Munar & Jacobsen, 2014; Yoo & Gretzel, 2011). Couture, Arcand, Sénécal, and Ouellet (2015) illustrate how domain-specific innovativeness influences tourists' online behaviour on marketers websites. However, there is still a lack of understanding what determines these content creators creative behaviour resulting into innovative-oriented communities. Tourism research requires new theories that can explain the link between users' creative traits and user-driven innovation in mobile computing travel platforms. Hence, the overall purpose of this study is to explain how consumers' creativity explains the forms of user-driven innovation in mobile computing travel platforms. Furthermore, the study aims to indicate intervening factors that enhances consumers' creative platform behaviour. Especially for marketers a study of this kind is important given that these platforms act as indirect marketing for their products and/or services. Hence, marketers should not underestimate the power of these user-driven innovative communities on their business models (Labrecque et al., 2013).

## 2 Research Hypothesis

When given an understanding of user-driven innovation in mobile computing platforms, the focus needs to start from understanding creative consumer behaviour. Psychology literature shows that creativity is the starting point of behaving or acting in an innovative way (Amabile, Conti, Coon, & Lazenby, 1996). Different researchers identified that some individuals are more creative than others. Creative performance requires a set of skills specific to creativity (Shalley & Gilson, 2004). In general, research acknowledges that characteristic traits and abilities have the strongest effect on individual creativity, and subsequently innovative behaviour (Yeh, Yeh, & Chen, 2012). Consumers with higher levels of innovativeness are often trendsetters, and have higher levels of confidence creating their own products (Lüthje, 2004). In addition, personality traits have an influence on the level of passion for being involved in creative activities (Wang & Yang, 2008). Wang and Yang (2008) examined how extraversion, agreeableness, conscientiousness, neuroticism, and openness were linked to passion for the internet. Hence, in the light of this study, the following hypotheses are introduced:

*H1* Consumer innovativeness has a direct, positive effect on domain-specific innovativeness.

*H2* Consumer innovativeness has a direct, positive effect on online creative self-efficacy.

*H3* Consumer innovativeness has a direct, positive effect on passion for the mobile computing platform.

Creative performance is only evidence when creative skills are built upon a base of domain expertise (Amabile et al., 1996). Goldsmith and Hofacker (1991) illustrate how users' expertise and past experience influences the level of innovativeness in a certain field (Goldsmith & Hofacker, 1991; Lüthje, 2004). Moreover, Füller, Matzler, Hoppe (2008) argue that consumers with domain-specific skills are more likely to feel confident and possess passionate feelings towards the community. Hence, it is likely that tourists who actively engage in mobile computing platforms may develop passionate feelings for their membership. Therefore, it is suggested that:

*H4* Domain-specific innovativeness has a direct, positive effect on online creativity.

*H5* Domain-specific innovativeness has a direct, positive effect on creative self-efficacy.

*H6* Domain-specific innovativeness has a direct, positive effect on passion for the mobile computing platform.

The capacity of self-judgment, self-efficacy, of content creators significantly contributes to their creative endeavours (Tierney & Farmer, 2002). Self-efficacy is

recognized as a critical determinant for users' behaviour in the ICT use context (Hsu, Ju, Yen, & Chang, 2007). The level of participation increases when the consumer will evaluate his own work more positively and is satisfied (Dong, Evans, & Zou, 2008). If consumers believe they are capable of performing a task, they will be more likely to engage in that behaviour (Dong et al., 2008). Thus, self-efficacy is perceived as a major factor of self-motivation to act in a good way (Tierney & Farmer, 2002). Hence, the perceived creative self-efficacy boosts users' creative practices in mobile computing platforms. The following hypothesis is suggested:

*H7* Creative self-efficacy has a direct, positive effect on online creativity.

A users' membership of mobile computing platforms requires time, energy and hours of engagement (i.e. in forms of reading, creating and sharing). This often results in the development of a strong emotional bond with the platform, such as passionate feelings. The level of commitment decides how consumers behave towards a brand, a brand community and the beloved outcomes. According to Füller et al. (2008) passion has a positive effect on consumer behaviour (i.e. productivity). Therefore, a passionate commitment to the mobile computing platform will enhance the exposed level of creativity in the platform. Hence, it is proposed that:

*H8* Passion for the mobile computing platform has a direct, positive effect on online creativity.

Lastly, a stimulating context and environment are important ingredients to foster consumers' creativity (Füller et al., 2007). According to Csikszentmihalyi (1999) the necessary resources support individuals performing their job and foster their creativity. The perceived ease of using the community has a positive effect on knowledge-sharing intentions and frequency (Kosonen, Gan, Olander, & Blomqvist, 2013). Thus, this effect is also expected in mobile computing platforms. Hence, the following hypothesis is suggested:

*H9* Supporting platforms conditions have a direct, positive effect on online creativity.

### **3 Research Design**

#### ***3.1 Sample***

The sample framework was users of a mobile computing travel platform that is available for free via the App Store. The mobile computing platform has over 30,000 members worldwide. Within this platform users are allowed to (1) create journals about their travels, (2) upload them at any time, (3) integrate various features offered by the platform (i.e. country stamp), (4) select their followers,

and (5) make entries with other members. Via e-mail members were asked to participate in an online self-administered survey, several vouchers were given away as a reward. In total 314 members filled in the survey, reflecting a 1.5 % response rate, whereof 137 fully completed surveys. In the sample were slightly more women (53.6 %) than men (46.4 %). The nationality was rather diverse; the majority originates from Europe (50.7 %), North America (30.4 %), Asia (8.7 %), South America (5.8 %) and Oceania (4.4 %). The majority of the respondents are between 21 years and 35 years old (31.5 %), 9.6 % was older than 50 years. Many of the respondents completed an undergraduate degree (40.5 %) or graduate degree (28.4 %). Furthermore, 51.9 % is employed for pay, 19.1 % is still studying and 14.2 % is self-employed, the remaining members were either looking for a job, retired or homemakers (<6 %).

### 3.2 Measures

The survey was designed based on eight main sections with related questions to (i) socio-demographic information, (ii) members' behaviour in the mobile computing platform, (iii) motivations to use the mobile computing platform, (iv) members' perceived creative traits and self-efficacy, (v) domain-specific innovativeness with travel-app features, (vi) their passion for their membership of the mobile computing platform, and (vii) their perceived support from the mobile computing platform when creating journals. The survey was designed primarily with closed-end questions and ordinal response scales (5 Likert scales). The *consumer innovativeness* construct is based upon scales measuring consumers' cognitive style for being creative (i.e. Kirton, 1978), six items were adapted from Pallister and Foxall's (1998) innovation scale (e.g. "I am inventive kind of person"). For the *domain-specific innovativeness* construct, a scale of four items is adopted from Agarwal and Prasad (1997). They used a shorter scale based upon Hofacker and Goldsmith's domain-specific innovativeness scale (e.g. "If I heard about a new travel-platform feature I would look for ways to experiment with it."). For the *creative self-efficacy* construct, four items are adopted from Tierney and Farmer (2002) scale of creative self-efficacy (e.g. "I believe I have the confidence in my ability to create innovative journals"). The *passion* construct is based upon Sternberg's (1997) passion scale with five items (e.g. "I think about the app several times a day."). The *online creativity* construct is based on a scale developed Kim, Zheng, and Gupta (2011) about creative online behaviour with four items (e.g. "I like to try new ways of creating journals"). The *supportiveness of the platform* is measured based on the scale of Bhattacharjee and Premkumar (2004) with four items (e.g. "The platform helps me to advance the presentation of my journals").

## 4 Results

### 4.1 Descriptive Analysis

The majority of the respondents use the mobile computing platform to create their own trip journals (66.5 %) or to follow others' trip journals (33.5 %). In general members create on an individual basis their trips (71.9 %), or they use the option to create journals together with friends and/or family. Respondents on average have one trip journal (40 %) or between two to five journals (38.5 %). Only a few respondents have more than six trip journals (4.5 %) or more than ten journals (4.5 %). The respondents primarily share travel-related content (89.9 %) when creating their entries. Interestingly, they also use it to share daily life activities (19.8 %), special happenings in their lives (i.e. wedding) (15.2 %) or things of interest (i.e. fashion) (12.7 %). Respondents argued that for making creative journals, they use text (78.8 %), include several photos (84 %), they geo-tag their moments in order to show it on the map (to show where exactly they are) (76.6 %) and they use the country stamp-feature (a feature offered by the mobile computing platform) (65.4 %). Relatively fewer members agreed that they manipulate their photos by inserting symbols, quotes or collages (25.3 %) or use filters for their photos (25.6 %).

Respondents evaluated themselves rather high on the following constructs: consumer innovativeness, creative self-efficacy, domain-specific innovativeness and online creativity. Furthermore, respondents perceive the platform to be highly supportive. Interestingly, respondents did not perceive themselves highly passionate towards the platform. Then, independent t-tests were performed to analyse the differences between respondents based on three factors; age, gender and satisfaction with of membership (Von Hippel et al., 2011). First, a marginal significant difference between the different age groups was found. The younger user (<35 years old) tend to use country stamp feature slightly more than the older respondents ( $\geq 35$  years) (younger than 35 years,  $M = 4.0$ ,  $St.D = 1.15$ , 35 years and older,  $M = 3.70$ ,  $St.D = 2.82$ ,  $t = -1.68$ , ( $p < 0.10$ ). Second, males show to perceive themselves as more innovative than women do (men  $M = 4.41$ ,  $St.D = 0.72$ , women  $M = 3.76$ ,  $St.D = 0.80$ ,  $t = -3.39$ , ( $p < 0.001$ )). Furthermore, males like to experiment more with new travel app features than women do (men  $M = 3.81$ ,  $St.D = 0.98$ , women  $M = 3.47$ ,  $St.D = 1.07$ ,  $t = 0.168$  ( $p = 0.04$ )). Furthermore, male use the geo-tag feature more than women do (female,  $M = 3.90$ ,  $St.D = 1.23$ , male  $M = 4.32$ ,  $St.D = 1.09$ ,  $t = -2.29$  ( $p < 0.005$ ). Lastly, there are significant difference between highly satisfied users and not satisfied users related to their online behaviour. For example, members who are very satisfied with their journals use significantly the geo-tag feature more than very unsatisfied members (very satisfied members,  $M = 4.5$ ,  $St.D = 0.89$ , very unsatisfied members  $M = 2.43$ ,  $St.D = 1.60$ ,  $t = -0.3545$  ( $p < 0.001$ )). Also, very satisfied members significantly use more than one photo when creating their journals compared to the unsatisfied members (very satisfied members,  $M = 4.65$ ,  $St.D = 0.58$ , very unsatisfied members

$M = 3.57$ ,  $St.D = 1.39$ ,  $t = -1.921$  ( $p < 0.001$ ). Hence, this demonstrates users' behaviour based on specific characteristics. Thus, for practitioners aiming to maintain an innovative-oriented platform, marketers are advised to carefully understand which traits and/or tools determine their users' behaviour.

## 4.2 PLS-SEM Analysis

This study uses Partial Least Square (PLS)-SEM to analyse the hypothesized model. Various authors demonstrate how PLS-SEM can be a good methodological alternative for theory testing and prediction (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014; Henseler & Fassott, 2010) in case researchers deal with small sample size (<200). PLS-SEM allows researchers to work with smaller sample sizes without losing its statistical power and convergence behaviour (Henseler & Fassott, 2010). PLS-SEM is also less stringent when working with non-normal data. The jack-knifing algorithm assists the PLS-algorithm in proceeding with non-normal data (Hair et al., 2014). Furthermore, PLS-SEM lacks an output of fit statistics (Hair et al., 2014), however, researchers instead evaluate the model quality based on the predictions of the endogenous constructs. The following three criteria are used for evaluation: (1) coefficient of determination, which reflects the model predictive accuracy ( $R^2$ ), (2) cross-validated redundancy ( $Q^2$ ), which is a mean for assessing the inner model predictive relevance, and (3) path coefficients (Hair et al., 2014). This study uses the 'SmartPLS' version 3.0 developed by Ringle, Wende, and Becker (2015). First, the outer models are analysed. The basic algorithm of PLS-SEM was used to provide factor loadings and outer weights. Chin (2010) recommends a narrow range between 0.70 and 0.90 which reflect a convergent validity of items to its underlying construct. Item DSI3 completely failed to respond to this range (0.130), neither was significantly ( $p < 0.005$ ) contributing to its latent construct 'domain-specific innovativeness'. Furthermore, Cronbach Alpha (CA), composite reliability (CR) and average variance extracted (AVE) were calculated. As Table 1 reads, all items satisfy the recommended minimum values, only domain-specific innovativeness has a slightly lower Cronbach Alpha's level (0.64) than the suggested cut-off level of 0.70.

**Table 1** Validity measures latent constructs

Constructs	Validity measures		
	AVE	CA	CR
Consumer innovativeness	0.56	0.83	0.88
Domain-specific innovativeness	0.56	0.64	0.80
Creative self-efficacy	0.84	0.93	0.95
Passion	0.60	0.84	0.89
Supporting platform conditions	0.71	0.87	0.90
Online creativity	0.76	0.89	0.92



Then, the inner model is analysed. First, explained variance ( $R^2$ ) and predictive ability of the endogenous variables are analysed ( $Q^2$ ). Chin (2010) refers to minimum of 0.10. The values read as follow: creative self-efficacy ( $R^2 = 0.398$ ,  $Q^2 = 0.302$ ), domain-specific innovativeness ( $R^2 = 0.282$ ,  $Q^2 = 0.314$ ), passion ( $R^2 = 0.120$ ,  $Q^2 = 0.057$ ) and online creativity ( $R^2 = 0.519$ ,  $Q^2 = 0.383$ ). Thus, only passion has a rather low predictive ability, whereas the other endogenous variables have positive explained variance as well as relatively strong predictive ability. Second, the path coefficients are calculated using the bootstrapping algorithm. Bootstrapping is a nonparametric approach for estimating the precision of path estimates (Chin, 2010; Henseler & Fassott, 2010). In this case 300 samples set were used to obtain the optimal parameter coefficients. According to Hair et al. (2014) increasing the number of samples supports smaller data set to increase significant paths and decreases the error. However, in this case, resampling numbers of 300, 600, and 900 did not influence the statistics. As a result, t-statistics per path are estimated; these t-statistics need to be above 1.96 in order to demonstrate a significant path. Observations from Table 2 demonstrate that consumer innovativeness influences consumers' domain-specific innovativeness ( $\beta.533$ ,  $t = 6.914$ ) and creative self-efficacy ( $\beta.408$ ,  $t = 3.081$ ), hypothesis 1 and 2 can be accepted. However, consumer innovativeness does not impact consumer's passionate feelings towards the platform ( $\beta.005$ ,  $t = 0.051$ ), thus hypothesis 3 is rejected. Domain-specific innovativeness significantly influences creative self-efficacy ( $\beta.306$ ,  $t = 3.170$ ) and passion ( $\beta.351$ ,  $t = 3.097$ ), thus hypotheses 5 and 6 are accepted. Domain-specific innovativeness ( $\beta.327$   $t = 4.419$ ) and passion ( $\beta.353$ ,  $t = 4.709$ ) are significantly influence online creativity, thus hypotheses 4 and 8 are accepted. Creative self-efficacy does not influence online creative ( $\beta.106$ ,  $t = 1.160$ ), thus hypotheses 7 is rejected. Lastly, supporting platforms conditions is a borderline case ( $\beta.166$ ,  $t = 1.819$ ). Surprisingly, the analysis also shows two paths to be non-significant (creative self-efficacy and supporting platforms conditions to online creativity). Those two paths were highly confirmed by previous studies (i.e. Füller et al., 2008). Hence, the falsification of these paths indicates that either a third

**Table 2** PLS-SEM results hypothesized paths

Hypothesis	Paths coefficients	T-statistics
H1: CI > CSE	0.408	3.801
H2: CI > DSI	0.533	6.914
H3: CI > P	0.005	0.051
H4: DSI > P	0.351	3.097
H5: DSI > CSE	0.306	3.170
H6: DSI > OC	0.327	4.419
H7: CSE > OC	0.106	1.160
H8: P > OC	0.353	4.709
H9: SPC > OC	0.166	1.819

Note: *CI* Consumer innovativeness, *DSI* Domain-specific innovativeness, *CSE* Creative self-efficacy, *P* Passion, *SPC* Supporting platforms conditions, *OC* Online creativity

unknown variable is interfering and/or possible adjustment within the model is required. Rigdon (2005) states that if researchers aim to proceed with a pre-specified model to find new paths one might employ tetrad analysis.

### 4.3 *Exploratory Analysis Using TETRAD*

This study uses the tool TETRAD to discover patterns supporting the PLS-SEM analysis. Various studies shows how TETRAD is a useful approach/tool supporting researchers to develop and uncover new potential theoretical relationships (Glymour, Scheines, Spirtes, & Kelly, 1988; Liu, 2009; Mazanec, 2007). The TETRAD tool is built on the principles of the Inferred Causation Theory (IC). The IC Theory relies upon: (1) causal graphs (DAG's) and (2) conditional independence relationships, in order to suggest causal relationships. IC Theory supports researchers to detect causality by combining building blocks from graph theory, statistics, logic and artificial intelligence research in computer science (Mazanec, 2007). In case of applying IC Theory, researchers are required to think in terms 'why' and 'in which' way variables are related to each other. In order to do so, researchers can take several subroutines to detect causal relationships between variables. In general there are two routines that can help researchers to complement their hypothesized models and/or to help them to generate new hypotheses: *search and build procedures*. The *search* procedure modifies a fully specified model and provides suggestions how to extend the model that can help to increase the model fit. The final model represents 'tetrads' which covariance pairs of variables (Mazanec, 2007). The *build* procedure is based on a model with partially specified relationships based on researchers' basic background knowledge. TETRAD helps researchers, thus, to add relationships and hereby build a causal inferred model.

### 4.4 *Application of TETRAD*

For the demonstration of IC Theory-based analysis, a simplified re-specification of variables is advocated (Mazanec, 2007). The demonstration avoids the latent variables, instead the best representative items operate as singleton variables. The input of TETRAD is (1) raw data or (2) a correlation matrix and a suggested graph. First, the *search* procedure has been applied using the suggested model presented in this paper. Interestingly, TETRAD does not suggest any additional links needed to increase models' accuracy. This implies that the suggested model possibly can hold in the data. Second, the *build* procedure is applied. In this case TETRAD is given more freedom to find possible causal relationships. The *build* procedure ran based on a temporal sequence of the variables. Figure 1 provides the suggested Inferred Causal Model. Interestingly, TETRAD identifies three additional conditional independencies (see dotted arrows). For example, consumer innovativeness

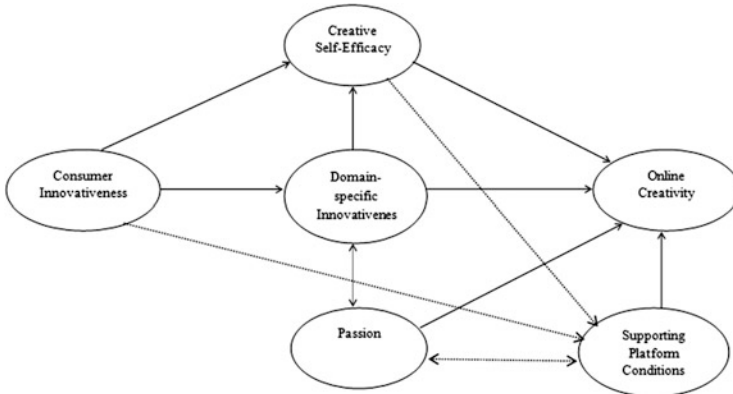


Fig. 1 Inferred causal model

and creative self-efficacy are suggested to have an influence on users' perceived supporting platform conditions. Furthermore, TETRAD suggests a recursive link between passion and supporting platforms conditions. Recursive links in TETRAD hint at causal relationships, however the direction cannot be defined and/or a third unknown variable may interfere. A similar situation holds true for the recursive link between passion and domain-specific innovativeness. Thus, especially the *build* procedure demonstrates nicely how TETRAD helps researchers to indicate relationships represented in the data, which support the PLS-SEM results. Overall, the demonstration illustrates the various options researchers have to use different methods in a complementary way in order to develop and/or extend theories.

## 5 Conclusion

The creative practices of tourists in Web 2.0 environment started to have their impact on many businesses' marketing practices. First, tourists increasingly started to return to their peers and heavily exchange their creative content. Second, the direct access to the various mobile computing platforms allows tourists to share at any given time very novel content expressing their holiday experiences. Research expansively analysed reasons why and in which way consumers are linked to these mobile computing platforms. However, research remains limited on how users' innate traits and engagement leads them to create the high numbers of user-driven innovative outcomes. Thus, the starting of this study was to understand which users' traits trigger user-driven innovations in the field of tourism. By analysing members of a mobile computing travel platform and using two methods in a complementary manner, various outcomes are exemplified. Initially PLS-SEM was used to identify variables explaining online creativity. The supplementary analyses by the IC Theory-based approach supported the study by demonstrating how consumer

innovativeness, creative self-efficacy and passion are directly related to one's perception about the platform. Furthermore, the two approaches both indicated that someone's passion towards the platform does not depend on their innate innovativeness; it seems to be only related with domain-specific innovativeness (Goldsmith & Hofacker, 1991). Moreover, as this study shows, consumers' innate creative traits and self-efficacy directly influences the way users perceive the platform as an easy tool to work with. Thus, PLS-SEM analysis complemented by IC-based approach illustrate the importance of users' traits influencing platform supporting platform perceptions, and subsequently impacting one's online behaviour. Fuller et al. (2007) referred to domain-specific innovativeness and passion influencing users' online creative behaviour. Kosonen et al. (2013) highlighted the importance of supporting platforms environment to foster creativity. However, this study illustrates how consumers' creative traits influence consumers' perception of the platform conditions, and subsequently leading to online creativity. In particular for practitioners these insights validate the importance of designing an effective working environment that leads to highly innovative outcomes. Practitioners can, by designing an effective mobile computing platform, attract innovative and engaged users and hereby ensure the success of their platform. For the theoretical implications, the attempt to integrate creativity theory and consumer involvement reveals the need to continue developing theories explaining user-driven innovative communities in tourism. Given the complexity of creativity (cognitive, behavioural but also context-depending factors), others variables need to be integrated that can explain users' creative behaviour. The IC-based approach demonstrated a possible third variable interfering with some paths (passion and supporting platform conditions). Given the online setting of this study, in particular the context-depending factors needs to be explored. Examples of significant variables that could enrich this study are social pressure, community bonding and attachment. Furthermore, this study used self-evaluative items which can also bias the understanding of 'true' user-driven innovative outcomes. Hence, future research needs to conduct approaches, such as netnography, to be able to analyse user-driven innovative communities. In addition, studies also need to analyse user-assessments of mobile computing travel platforms to indicate what hinders them precisely to creatively create content. Overall, there is a high need for exploring the concept of user-driven innovation in mobile computing platforms in tourism.

## References

- Agarwal, R., & Prasad, J. (1997). The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decision Sciences*, 28(3), 557–582.
- Amabile, T. M., Conti, R., Coon, H., & Lazenby, J. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39(5), 1154–1184.
- Bhattacharjee, A., & Premkumar, G. (2004). Understanding changes in belief and attitude toward information technology usage: a theoretical model and longitudinal test. *MIS Quarterly*, 229–254.

- Bronner, F., & De Hoog, D. (2013). Vacationers and Ewom; who posts, and why, where and what? *Journal of Travel Research*, 50(1), 15–26.
- Chin, W. W. (2010). How to write up and report PLS analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares concepts, methods and applications* (pp. 650–690). Berlin: Springer.
- Couture, A., Arcand, M., Sénécal, S., & Ouellet, J. F. (2015). The influence of tourism innovativeness on online consumer behavior. *Journal of Travel Research*, 54(1), 66–79.
- Csikszentmihalyi, M. (1999). 16 Implications of a systems perspective for the study of creativity. In M. Csikszentmihalyi (ed.) *Handbook Of Creativity*, 313.
- Dawson, P., & Andriopoulos, C. (2014). *Managing change, creativity and innovation*. London: Sage.
- Dong, B., Evans, K. R., & Zou, S. (2008). The effects of customer participation in co-created service recovery. *Journal of the Academy of Marketing Science*, 36(1), 123–137.
- Edmonds, E. A., et al. (2005). The studio as laboratory: Combining creative practice and digital technology research. *International Journal of Human-Computer Studies*, 63(4), 452–481.
- Füller, J., Jawecki, G., & Muhlbacher, H. (2007). Innovation creation by online basket communities. *Journal of Business Research*, 60, 60–71.
- Füller, J., Matzler, K., & Hoppe, M. (2008). Brand community members as a source of innovation. *Journal of Product Innovation Management*, 25(6), 608–619.
- Glymour, C., Scheines, R., Spirtes, P., & Kelly, K. (1988). TETRAD: discovering causal structure. *Multivariate Behavioral Research*, 23(2), 279–280.
- Goldsmith, R. E., & Hofacker, C. F. (1991). Measuring consumer innovativeness. *Journal of the Academy of Marketing Science*, 19(3), 209–221.
- Hair, J., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European Business Review*, 26(2), 106–121.
- Henseler, J., & Fassott, G. (2010). Testing moderating effects in PLS path models: An illustration of available procedures. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares concepts, methods and applications* (pp. 713–735). Berlin: Springer.
- Hjalager, A. M., & Nordin, S. (2011). User-driven innovation in tourism—A review of methodologies. *Journal of Quality Assurance in Hospitality & Tourism*, 12(4), 289–315.
- Hsu, M., Ju, T. L., Yen, C., & Chang, C. (2007). Knowledge sharing behavior in virtual communities; the relationship between trust, self-efficacy and outcome expectations. *International Journal Human-Computer Studies*, 63, 153–169.
- Kim, H.-W., Zheng, J. R., & Gupta, S. (2011). Examining knowledge contribution from the perspective of an online identity In blogging communities. *Computers In Human Behavior*, 27(5), 1760–1770.
- Kirton, M. (1978). Have adaptors and innovators equal levels of creativity? *Psychological Reports*, 42(3), 695–698.
- Kosonen, M., Gan, C., Olander, H., & Blomqvist, K. (2013). My idea is our idea! Supporting user-driven innovation activities in crowdsourcing communities. *International Journal of Innovation Management*, 17(3), 1–18.
- Kozinets, R. V., Hemetsberger, A., & Schau, H. J. (2008). The wisdom of consumer crowds collective innovation in the age of networked marketing. *Journal of Macromarketing*, 28(4), 339–354.
- Labrecque, L. I., vor dem Esche, J., Mathwick, C., Novak, T. P., & Hofacker, C. F. (2013). Consumer power: Evolution in the digital age. *Journal of Interactive Marketing*, 27(4), 257–269.
- Lamsfus, C., Wang, D., Alzua-Sorzabal, A., & Xiang, Z. (2014). Going mobile defining context for on-the-go travelers. *Journal of Travel Research*. doi:10.1177/0047287514538839.
- Liu, L. (2009). Technology acceptance model: A replicated test using TETRAD. *International Journal of Intelligent Systems*, 24(12), 1230–1242.

- Lüthje, C. (2004). Characteristics of innovating users in a consumer goods field: An empirical study of sport-related product consumers. *Technovation*, 24(9), 683–695.
- Mazanec, J. A. (2007). Exploring tourist satisfaction with nonlinear structural equation modeling and inferred causation analysis. *Journal of Travel & Tourism Marketing*, 21(4), 73–90.
- Munar, A. M., & Jacobsen, J. K. S. (2014). Motivations for sharing tourism experiences through social media. *Tourism Management*, 43, 46–54.
- Nielsen, J. (2006, October). *The 90-9-1 rule for participation inequality in social media and online communities*. Retrieved from: <http://articles/participation-inequality/> (Last accessed: April 15, 2014).
- Pallister, J. G., & Foxall, G. R. (1998). Psychometric properties of the Hurt–Joseph–Cook scales for the measurement of innovativeness. *Technovation*, 18(11), 663–675.
- Richardson, I., Third, A., & MacColl, I. (2007). *Moblogging and belonging: New mobile phone practices and young people's sense of social inclusion*. Perth, Australia: Murdoch University.
- Rigdon, E. E. (2005). Structural equation modeling: Nontraditional alternatives. *Wiley StatsRef: Statistics Reference Online*.
- Ringle, C. M., Wende, S., & Becker, J.-M. (2015). *SmartPLS 3*. Bönningstedt: SmartPLS GmbH.
- Seraj, M. (2012). We create, we connect, we respect, therefore we are: Intellectual, social, and cultural value in online communities. *Journal of Interactive Marketing*, 26(4), 209–222.
- Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *The Leadership Quarterly*, 15(1), 33–53.
- Sternberg, R. J. (1997). Construct validation of a triangular love scale. *European Journal of Social Psychology*, 27(3), 313–335.
- Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 46(8), 1137–1148.
- Van Dijck, J. (2009). Users like you? Theorizing agency in user-generated content. *Media, Culture and Society*, 31(1), 41–58.
- Von Hippel, E. (2007). Horizontal innovation networks—by and for users. *Industrial and Corporate Change*, 16(2), 293–315.
- Von Hippel, E. A., Ogawa, S., & de Jong, J. (2011). The age of the consumer-innovator. *MIT Sloan*, 53(1), 1–16.
- Wang, C. C., & Yang, H. W. (2008). Passion for online shopping: The influence of personality and compulsive buying. *Social Behavior and Personality: An International Journal*, 36(5), 693–706.
- Yeh, Y., Yeh, Y., & Chen, Y. H. (2012). From knowledge sharing to knowledge creation: A blended knowledge management model for improving university students' creativity. *Thinking Skills and Creativity*, 7, 245–257.
- Yoo, H., & Gretzel, U. (2011). Influence of personality on travel-related consumer-generated media creation. *Computers in Human Behavior*, 27(2), 609–621.

# Pilgrims' Acceptance of a Mobile App for the Camino de Santiago

Angela Antunes and Suzanne Amaro

**Abstract** This study aims to identify which factors affect pilgrim's intentions to use a pilgrimage app, based on the extended unified theory of acceptance and use of technology (UTAUT2). The empirical results were obtained from a sample of 222 pilgrims of the Camino de Santiago (Saint James's Way). Partial Least Squares Structural Equation Modelling was applied to test the hypothesized relationships of the proposed model. The results indicate that the most important factor affecting intentions to use the app is performance expectancy. Effort expectancy, social influence and hedonic motivations are other determinants of intentions to use a pilgrimage app. Facilitating conditions and habit do not affect intentions to use the app. The results of this study are valuable for a successful implementation of pilgrimage apps, providing useful insights for pilgrimage app designers.

**Keywords** Camino de Santiago • Partial least squares • UTAUT 2 • Religious tourism

## 1 Introduction

The mobile internet devices sector (such as smartphones and tablets) has experienced a significant growth (Palumbo, Dominici, & Basile, 2014). In particular, the use of mobile devices has significantly grown and is expected to grow further. In 2013, 73.4 % of the global online population accessed the Internet from their mobile phone and is expected to grow to 90.1 % in 2017 (Statista, 2015a). There are predictions that by 2017, 5.13 billion people worldwide will use a mobile phone (eMarketer, 2014).

These developments have definitely revolutionized the tourism industry and have created unprecedented opportunities. With new technologies being developed, tourists take part in new types of activities (Neuhofer, Buhalis, & Ladkin, 2014). While travelling, travelers can easily access their smartphone or other mobile device to search for more information about the chosen destination. Travelers are

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seen as “virtual tourists” with their “travel buddy”(Palumbo et al., 2014). Ninety four percent of leisure travelers said they carried at least one mobile device while traveling (Statista, 2015c). These mobile devices are used on vacation to access maps (67 %), look for restaurants (56 %), look for things to do (51 %), read reviews (47 %) and to look for hotels 36 % (TripAdvisor, 2015). Associated with the use of mobile devices is, evidently, the use of mobile applications (apps). Travel related apps ranked as one of the most downloaded categories of mobile applications (Statista, 2015b).

The features provided by travel apps are particularly useful for pilgrims, frequently recognized as religious tourists. Indeed, along their pilgrimage, pilgrims need to access maps or need information about the difficulty of the route they are taking. On the other hand, when they arrive to places along their pilgrimage, they want to explore the local culture. Apps can be useful in several situations to indicate, for example, the best route to take, points of interest, restaurants or a place to stay.

The concept of pilgrim is very similar to the concept of tourist. Indeed, religious tourism is connected to holidays and cultural tourism (Rinschede, 1992). Collins-Kreiner (2010) argues that there are no distinctions between pilgrimage sites and tourist attractions because tourists motivations can change at any moment.

Surprisingly, although there are some studies focusing on the use of mobile devices by tourists, little is known about the use of new technologies specifically by pilgrims and which factors could affect intentions to use a pilgrimage app. Therefore, the main aim of the current study is to evaluate which factors most influence intentions to use a mobile app for the St. James Way (Camino de Santiago). For this purpose, several hypotheses are proposed, grounded on the Extended Unified Theory of Acceptance and Use of Technology (UTAUT 2) proposed by Venkatesh, Thong, and Xu (2012). The findings of the study will be useful for pilgrim app developers, in particular for the Camino de Santiago, to design apps adapted to the pilgrim’s needs and to develop strategies to encourage pilgrims to use the app. On the other hand, before investing in a pilgrimage app, it is vital to examine pilgrim’s acceptance to increase the chances of a successful implementation.

## 2 Literature Review

### 2.1 *Camino de Santiago*

The *Camino de Santiago* is an ancient route made by pilgrims to visit the place where the bones of the Apostle Saint James are buried, in northern Spain, in the city of Santiago de Compostela. All year round, thousands of pilgrims walk the ways to the Apostle’s shrine, which makes this place one of the Christian World’s most sacred sites after Jerusalem and Rome. In 1985, UNESCO declared Santiago de Compostela World Heritage. In 1987, the Saint James pilgrimage routes were



declared the first European Cultural Itinerary by the Council of Europe (Gardner, Mentley, & Signori, 2015). In the 90s, UNESCO also considers segments of the routes in Spain and France World Heritage for the amount of roman, gothic, baroque and neoclassical architectural traces.

The pilgrimage to Santiago de Compostela has become very popular in the last 25 years (Gardner et al., 2015), which may be the result of the an increase in the number of tourists taking spiritual journeys outside the parameters of pilgrimage patterns (Digance, 2003; González, 2013). According to the available data from the Pilgrim's Office (2014), 237,886 pilgrims arrived to Santiago in 2014. Most took the way by walking (88.7 %), followed by cycling (10.6 %). Less than 1 % came on horseback or in a wheelchair.

Pilgrimage has been defined as “a journey resulting from religious causes, externally to a holy site, and internally for spiritual purposes and internal understanding” (Barber, 1993, p. 1). Ancient pilgrims were guided by religious motivations, and this type of pilgrimage has always existed. Yet, nowadays, religious motivations are not the only reason why people walk the *Camino de Santiago*. Pilgrimage to Santiago de Compostela is also a cultural journey, because the pilgrim cannot be detached from the cultural interests, which are inherent to the journey. Leaving home, carrying the backpack, the pilgrim is prepared to take a journey to meet other cultures. Contemplating nature, combined with the cultural legacy of the churches are attractive reasons for taking the *Camino de Santiago* (González, 2013). Pilgrims to Santiago indicate that their motivations are mostly cultural-religious (50.6 %), followed by religious (42.46 %) and cultural (6.92 %) motivations (Pilgrim's Welcome Office, 2014).

## 2.2 Pilgrims Use of Mobile Devices

An initial search for relevant literature, i.e. addressing the use of new technologies by pilgrims, revealed that research on this topic is scarce. Only one paper by Nickerson, Austreich, and Eng (2014) was found. The aim of their research was to examine the diffusion of mobile technology and smartphone apps among people that had walked the Camino de Santiago. They found that 69 % of the respondents carried mobile devices and 17 % had used Camino specific smartphone apps.

Since only one study specifically addressed pilgrim's use of new technologies, research on tourists' use of mobile devices was conducted. Although tourists have different behaviours from pilgrims, several authors consider that is difficult to distinguish them (e.g. Digance, 2003; Turner & Turner, 1978). Indeed, pilgrims frequently carry out touristic behaviours, such as visiting historical or cultural places, experiencing nature, adventure or sport. At the same time, tourists often include in their journey visits to churches, temples and holy sites (Digance, 2003). Turner and Turner's (1978) frequently quoted statement that “a tourist is half a pilgrim, if a pilgrim is half a tourist” (p. 20) reflects the difficulty in distinguishing a pilgrim from a tourist.

Tourists carry smartphones or mobile devices everywhere and these devices play a key role on the touristic experience (Wang, Park, & Fesenmaier, 2012). During the trip, travel app can be very useful as they can detect tourist's location and provide relevant information, such as restaurants, souvenir shops, gas stations, (Wang et al., 2012). Research has shown that the use of the smartphone makes travel planning easier, makes travellers feel more connected with their families and friends and also makes them feel more informative (Wang & Fesenmaier, 2013). The use of mobile technology can actually change tourists' behaviour and even their emotional state (Wang & Fesenmaier, 2013).

The emerging mobile recommender systems are also substantially enriching tourist experiences (Gavalas, Konstantopoulos, Mastakas, & Pantziou, 2014) by helping tourists to discover and select points of interest that best fit their preferences (Garcia, Torre, & Linaza, 2014).

### ***2.3 Extended Unified Theory of Acceptance and Use of Technology***

The UTAUT 2 (Venkatesh et al., 2012) is an extension of the unified theory of acceptance and use of technology (UTAUT) proposed earlier by Venkatesh, Morris, Davis, and Davis (2003). The UTAUT is indeed a unified theory since it was formulated integrating concepts from several models of acceptance behavior: the theory of reasoned action (Fishbein & Ajzen, 1975), the theory of planned behavior (Ajzen, 1991), the technology acceptance model (Davis, 1989), the motivational model (Vallerand, 1997), the model of PC utilization (Thompson, Higgins, & Howell, 1991), the innovation diffusion theory (Rogers, 1995) and the social cognitive theory (Bandura, 1986). Based on the integration of these theories and empirical testing the authors found that technology acceptance could be predicted by performance expectancy, effort expectancy, social influences and facilitating conditions. However, the theory was tailored for an organizational setting. Therefore, the UTAUT was modified for the consumer technology acceptance and use context, creating the UTAUT 2, which integrates three more factors affecting technology acceptance: hedonic motivations, price value and habit. An explanation of these concepts is presented in Table 1.

In the travel apps field, Lai (2013) applied the UTAUT model to examine if performance expectancy, effort expectancy, social influence facilitating conditions and entertainment (a concept identical to hedonic motivation) influenced intentions to use an app-based mobile tour guide. The results evidenced that all of these factors, except for entertainment, had an influence on intentions to use an app based mobile tour guide. In earlier studies, performance expectancy and effort expectancy were found to influence tourist acceptance of mobile technology (Kim, Park, & Morrison, 2008; Oh, Lehto, & Park, 2009).

**Table 1** Definition of constructs in the UTAUT 2

Construct	Definition
Performance Expectancy	The degree to which using a technology will provide benefits.
Effort Expectancy	The degree of effort associated with the use of the technology.
Social Influence	The degree to which people perceive that important others believe that they should use the technology.
Facilitating Conditions	The perceptions of the resources and support available to use the technology.
Hedonic Motivation	The fun or pleasure derived from using a technology.
Habit	The extent to which people tend to perform behaviours automatically, in result of prior experiences.
Price Value	Consumers' cognitive trade-off between the perceived benefits of the applications and the monetary cost for using them.

Based on these findings and on the UTAUT 2, the following hypotheses were proposed:

*H1* The performance expectancy in the use of a mobile app for the Camino de Santiago positively affects intentions to use the app.

*H2* The effort expectancy in the use of a mobile app for the Camino de Santiago positively affects intentions to use the app.

*H3* The social influence regarding the use of a mobile app for the Camino de Santiago positively affects intentions to use the app.

*H4* The facilitating conditions perceived in the use of a mobile app for the Camino de Santiago positively affects intentions to use the app.

*H5* The hedonic motivation experienced in the use of a mobile app for the Camino de Santiago a mobile app for the Camino de Santiago positively affects intentions to use the app.

*H6* The habit regarding the use of apps positively affects intentions to use an app for the Camino de Santiago.

The effect of price value was not considered since the aim was to examine pilgrims' acceptance of a pilgrimage app in general, not a specific app with a defined price.

### 3 Methods

Data was collected in the last week of July of 2015 using an online survey. An email with a link to the survey was sent to Via Lusitana (a Portuguese Association of Camino de Santiago), friends, colleagues and other emails contacts collected. The

**Table 2** Measures for the UTAUT 2 constructs

Construct	Indicators
Performance expectancy	PE1—I find mobile apps for pilgrim routes very useful for pilgrim journeys. PE2—Using a pilgrim route app increases my chances of achieving things that are important to me in the pilgrim journey. PE3—Using a pilgrim route app helps me to accomplish things more quickly when on pilgrim journey. PE4—I can save time when I use a pilgrim route app on a pilgrim journey.
Effort expectancy	EE1—Learning how to use pilgrim route apps is easy for me. EE2—My interaction with mobile apps is clear and understandable. EE3—I find mobile apps easy to use. EE4—It is easy for me to become skilful at using a pilgrim route app.
Social influence	SI1—People who are important to me think that I should use mobile apps. SI2—People who influence my behaviour think that I should use pilgrim route apps.
Facilitating conditions	FC1—I have the resources necessary to use pilgrim route apps. FC2—I have the knowledge necessary to use pilgrim route apps. FC3—Pilgrim route apps are compatible with other technologies that I use. FC4—I can get help from others when I have difficulties using pilgrim route apps.
Hedonic motivation	HM1—Using pilgrim route apps is fun. HM2—Using pilgrim route apps is enjoyable. HM3—Using pilgrim route apps is very entertaining.
Habit	HBT1—The use of mobile apps has become a habit to me. HBT2—I am addicted to using apps. HBT3—I must use apps. HBT4—Using mobile apps has become natural to me.
Intentions to use app	BI1—If you were to go on a pilgrim journey the probability of using a pilgrim route app would be. . . BI 2—I intend to use a pilgrim route app on a future journey.

link to the survey was also posted on Camino de Santiago Facebook groups and forums. The survey was open to individuals aged 18 or older and that had taken the Camino de Santiago at least once. A total of 222 valid responses were obtained.

The first part of the survey contained questions about pilgrims' demographics and experience with the Camino. The second part had questions to measure the constructs that influence behavioural intentions to use the app, based on UTAUT2 (Venkatesh et al., 2012) and presented in Table 2. The indicators presented in Table 2 were measured using a 5 point Likert scale where 1 represented "Strongly Disagree" and 5 represented "Strongly Agree", except for BI1, where 1 represented "Very Low" and 5 represented "Very High". The questionnaire also included an open question for respondents to leave suggestions for a mobile app for the *Camino de Santiago*.

The hypotheses were tested using Partial Least Squares (PLS), a component-based structural equation modelling technique. To assess a model using PLS, researchers must first examine the outer (measurement) model. If the outer model reveals reliability and validity, the second step consists in the assessment of the

inner model, testing the proposed hypotheses. The parameters of the outer and inner model were estimated using SmartPLS 3.0 (Ringle, Wende, & Becker, 2015).

## 4 Results

### 4.1 Respondents Profile

Respondents in this study were Portuguese pilgrims that had walked the *Camino de Santiago* at least once. The average number of times pilgrims had taken the Camino was 2.77, ranging from 1 time to 24 times. More than 82 % of the respondents had travelled by foot, while 22 % had already taken the path by bike. Pilgrims main motivation to travel the Camino is spiritual (65 %), followed by cultural and religious motivations (42 % and 31 %, respectively).

The age group with the most significant number of responses was the age group 35–44, with 37.4 % of the total of responses, while only approximately 17 % are aged over 55. The respondents are also highly educated, since 60 % have at least a college degree. In terms of gender, there is a skew towards a higher proportion of male participants (64.9 %). According the Pilgrim's Welcome Office (2014) there are slightly more male pilgrims than women (54 % males in 2014).

### 4.2 Assessment of the Outer Model

The assessment of the outer model involves examining the constructs' indicators reliability, internal consistency reliability, convergent validity and discriminant validity (Hair, Ringle, Hult, & Sarstedt, 2014).

The results shown in Table 3 indicate that the measures are robust in terms of their reliability, since all Cronbach's alpha exceed the recommended threshold value of 0.7. Furthermore, all indicator loadings are higher than 0.7, indicating that each measure is accounting for 50 % or more of the variance of the underlying construct (Chin, 1998; Henseler, Ringle, & Sinkovics, 2009). Moreover, indicator loadings are significant at the 0.001 level, as shown by the *t* values obtained through bootstrapping. Convergent validity was also confirmed by the average variance extracted (AVE) that are all above 0.5 (Bagozzi & Yi, 1988; Fornell & Larcker, 1981).

Discriminant validity was also assessed with two measures that are typically used, the Fornell-Larcker criterion and the cross loadings (Henseler et al., 2009) and also with a new approach proposed recently by Henseler, Ringle, and Sarstedt (2015), the heterotrait-monotrait ratio of correlations (HTMT). All three approaches used to assess discriminant validity supported the validity of the scales used.

**Table 3** Means, indicator loadings and reliability measures

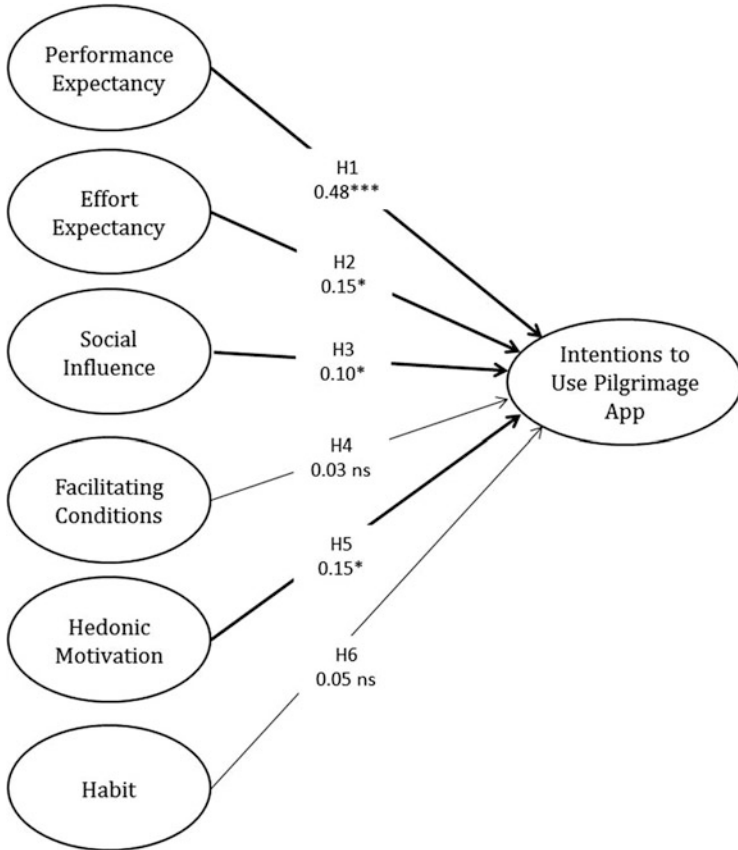
Constructs and indicators	Mean	Indicator loadings	Cronbach alfa	AVE
Performance expectancy				
PE1	4.23	0.88***	0.92	0.81
PE2	3.96	0.91***		
PE3	3.78	0.92***		
PE4	3.55	0.89***		
Effort expectancy				
EE1	3.99	0.91***	0.96	0.89
EE2	4.05	0.95***		
EE3	4.10	0.96***		
EE4	4.11	0.94***		
Social influence				
SI1	3.07	0.93***	0.84	0.86
SI2	2.62	0.93***		
Facilitating conditions				
FC1	3.83	0.88***	0.89	0.76
FC2	4.01	0.92***		
FC3	4.05	0.93***		
FC4	3.73	0.74***		
Hedonic motivation				
HM1	3.77	0.96***	0.91	0.86
HM2	3.86	0.97***		
HM3	3.21	0.84***		
Habit				
HBT1	3.63	0.89***	0.89	0.75
HBT2	2.26	0.83***		
HBT3	2.41	0.84***		
HBT4	3.23	0.90***		
Intentions to use app				
BI1	3.69	0.97***	0.93	0.94
BI2	3.71	0.97***		

\*\*\* Significant at 0.001 level

### 4.3 Assessment of the Inner Model

Since the outer model evaluation provided evidence of reliability and validity, the inner model estimates were examined to assess the hypothesized relationships among the constructs in the conceptual model. Figure 1 provides the results of testing the structural links of the proposed research model using PLS.

The figure illustrates that H1, H2, H3 and H5 were supported, while H3 and H6 were not. The results show that pilgrims' intentions to use a pilgrimage app depend mostly on performance expectancy. This result is consistent with other studies examining tourists' acceptance of mobile apps (e.g. Kim et al., 2008; Oh et al., 2009). Intentions to use a pilgrimage app are also affected by effort expectancy, hedonic motivations and, to a lesser degree, by social influences. However, having



**Fig. 1** Results of the PLS analysis. \*Significant at 0.5. \*\*\*Significant at 0.001 level

the knowledge and the resources to use apps (facilitating conditions) does not affect intentions to use a pilgrimage app. In a similar vein, Habit did not affect intentions to use pilgrimage app. This result suggests that individuals that actively use apps on a daily basis may not choose to use apps when taking a pilgrimage journey. Several respondents mentioned in the open ended question of the questionnaire that people that used new technologies on a pilgrimage would forgo the religious experience and that they were against the use of new technologies when experiencing spiritual practices.

The  $R^2$  of intentions to use a pilgrimage app is 0.689, which means that 68.9 % of its variance is explained by performance expectancy, effort expectancy, social influence and hedonic motivations. In the consumer behaviour discipline, several researchers consider that  $R^2$  values of 0.25 are considered high (Hair et al., 2014; Henseler, Ringle, & Sarstedt, 2012). Thus, the value of 0.689 evidences the model's high predictive quality.

## 5 Conclusions

This study attempts to apply the UTAUT 2 model to examine pilgrim's acceptance of a pilgrimage app, by determining which factors influence intentions to use a pilgrimage app. Since studies addressing this issue are limited, the current study contributes to a better understanding of pilgrim's needs and preferences by providing a user acceptance model of mobile technology. The findings are useful for app designers and providers of pilgrimage apps, in particular for the *Camino de Santiago*. While there are several apps for the *Camino de Santiago*, for the Portuguese Way of Saint James, an efficient app to help pilgrims on this Way is inexistent.

The most important conclusion of this study is that performance expectancy is the major driving force of intentions to use a pilgrimage app. This highlights the importance of creating an app that is useful and that enables pilgrims to save time and accomplish things more quickly. Pilgrimage app designers must focus on these features. For example, many tourists adopt contextual recommendation due to its perceived benefits (Tussyadiah & Wang, 2014) and use apps with the "near me" function (Wang et al., 2012). Therefore, it is most valuable to incorporate context-aware mobile applications to suggest useful information considering the pilgrims location. On the other hand, pilgrimage app providers should focus their marketing efforts on enhancing pilgrims' performance expectancy.

Pilgrimage app designers should also design an easy to use and, at the same time entertaining app, since these are other features that affect intentions to use the app. Since social influence is another determinant of intentions to use a pilgrimage app, pilgrimage app providers need to create incentives to promote word of mouth, specifically, electronic word of mouth. For instance, the app should have a feature to easily share information on social networks.

Mobile technology offers new and unique opportunities for organizations and businesses that are interested in attracting pilgrims. Therefore, pilgrimage app developers should work hand in hand with cities and towns that belong to the *Camino de Santiago* in order to attract religious tourists and pilgrims.

It should be noted that the two questions pertaining pilgrims' intentions to use a pilgrimage app (BI1 and BI2 in Table 2) scored values of 3.69 and 3.71. Considering that all respondents are Internet users and therefore have at least some knowledge with the use of technologies, these scores, although above average, seem relatively low. These results should be interpreted with caution since pilgrims' motivations to undertake their journey may not be compatible with the use of mobile devices. Indeed, many pilgrims look for an experience without material interest and the simplistic pursuit of gain (Oviedo, de Courcier, & Farias, 2013).

The UTAUT2 (Venkatesh et al., 2012) acknowledges that age, gender and experience could moderate the effects of habit, facilitating conditions and hedonic motivations on behavioral intentions. Therefore, future work should also consider examining these relationships.



One of the limitations of this study is that it employed a convenience sample, composed only by Portuguese pilgrims that had taken the Camino de Santiago at least once. Thus, the results cannot be generalized and must be interpreted with caution. It would be worthwhile to use pilgrims from other nationalities and also from other pilgrimage routes and compare with the results obtained in this study. Future work could also conduct multi-group analysis to compare the relationships in the model between, for example, different groups of pilgrims based on their motivations or innovativeness.

Another limitation of the study is that the respondents were not filtered based on their previous experience with the use of pilgrimage apps. Thus, some respondents may have already used pilgrimage apps, while others may have never used them. In this latter case, they would have to imagine, based on their use of apps in general, if a pilgrimage app would be useful, easy to use and entertaining. Despite the limitations of this study, the results are useful for app designers and providers of pilgrimage apps. On the other hand, this study contributes to the literature concerning the use of mobile apps among pilgrims, which is nearly inexistent.

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## References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74–94.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Barber, R. (1993). *Pilgrimages*. London: The Boydell Press.
- Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS Quarterly*, 22(1), vii–xvi.
- Collins-Kreiner, N. (2010). Researching pilgrimage. *Annals of Tourism Research*, 37(2), 440–456.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Digance, J. (2003). Pilgrimage at contested sites. *Annals of Tourism Research*, 30(1), 143–159.
- eMarketer. (2014). *Smartphone users worldwide will total 1.75 billion in 2014*. Retrieved August 27th, 2015, from <http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536>
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behaviour: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Garcia, A., Torre, I., & Linaza, M. T. (2014). Mobile social travel recommender system. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 3–16). Switzerland: Springer.

- Gardner, S., Mentley, C., & Signori, L. (2015). Whose camino is it? (Re)defining Europe on the Camino de Santiago. In S. Sánchez y Sánchez & A. Hesp (Eds.), *The Camino de Santiago in the 21st Century: Interdisciplinary perspectives and global views* (pp. 57–80). New York, NY: Routledge.
- Gavalas, D., Konstantopoulos, C., Mastakas, K., & Pantziou, G. (2014). Mobile recommender systems in tourism. *Journal of Network and Computer Applications*, 39, 319–333.
- González, R. C. L. (2013). The Camino de Santiago and its contemporary renewal: Pilgrims, tourists and territorial identities. *Culture and Religion*, 14(1), 8–22.
- Hair, J. F., Ringle, C. M., Hult, G. T. M., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks, CA: Sage.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in international advertising research: Basic concepts and recent issues. In S. Okazaki (Ed.), *Handbook of research in international advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar Publishing.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20, 277–319.
- Kim, D.-Y., Park, J., & Morrison, A. M. (2008). A model of traveller acceptance of mobile technology. *International Journal of Tourism Research*, 10(5), 393–407.
- Lai, I. K. W. (2013). Traveler acceptance of an app-based mobile tour guide. *Journal of Hospitality & Tourism Research*, 39(3), 401–432.
- Neuhofner, B., Buhalis, D., & Ladkin, A. (2014). A typology of technology-enhanced tourism experiences. *International Journal of Tourism Research*, 16(4), 340–350.
- Nickerson, R. C., Austreich, M., & Eng, J. (2014). *Mobile technology and smartphone apps: A diffusion of innovation analysis*. Paper presented at the Twentieth Americas Conference on Information Systems, Savannah.
- Oh, S., Lehto, X. Y., & Park, J. (2009). Travelers' intent to use mobile technologies as a function of effort and performance expectancy. *Journal of Hospitality Marketing & Management*, 18(8), 765–781.
- Oviedo, L., de Courcier, S., & Farias, M. (2013). Rise of pilgrims on the Camino to Santiago: Sign of change or religious revival? *Review of Religious Research*, 56(3), 433–442.
- Palumbo, F., Dominici, G., & Basile, G. (2014). The culture on the palm of your hand: How to design a user oriented mobile app for museums. In L. Aiello (Ed.), *Handbook of research on management of cultural products: E-relationship marketing and accessibility perspectives* (pp. 225–244). Hershey: IGI Global.
- Pilgrim's Welcome Office. (2014). *La Peregrinación a Santiago en 2014*. Retrieved August 27th, 2015, from <http://peregrinossantiago.es/eng/pilgrims-office/statistics/?anio=2014&mes=>
- Ringle, C. M., Wende, S., & Becker, J.-M. (2015). *Smart PLS 3*. Retrieved from <http://www.smartpls.com>
- Rinschede, G. (1992). Forms of religious tourism. *Annals of Tourism Research*, 19, 51–67.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: The Free Press.
- Statista. (2015a). *Mobile phone internet user penetration worldwide from 2012 to 2017*. Retrieved August 27th, 2015, from <http://www.statista.com/statistics/284202/mobile-phone-internet-user-penetration-worldwide/>
- Statista. (2015b). *Most popular Apple App Store categories in June 2015, by share of available apps*. Retrieved August 27th, 2015, from <http://www.statista.com/statistics/270291/popular-categories-in-the-app-store/>
- Statista. (2015c). *Share of travelers who take at least one mobile device on trips worldwide as of October 2014, by traveler type*. Retrieved August 27th, 2015, from <http://www.statista.com/statistics/368295/travelers-who-take-at-least-one-mobile-device-on-trips-by-traveler-type/>

- Thompson, R. L., Higgins, C. A., & Howell, J. M. (1991). Personal computing: Toward a conceptual model of utilization. *MIS Quarterly*, 125–143.
- TripAdvisor. (2015). *Global "TripBarometer Connected Traveler" report uncovers booking trends and behaviors of smartphone-engaged consumers*. Retrieved August 27th, 2015, from <http://ir.tripadvisor.com/releasedetail.cfm?ReleaseID=919990>
- Turner, V. W., & Turner, E. (1978). *Image and pilgrimage in christian culture: Anthropological perspectives*. New York: Colombia University Press.
- Tussyadiah, I. P., & Wang, D. (2014). Tourists' attitudes toward proactive smartphone systems. *Journal of Travel Research*. doi: [10.1177/004728751456316](https://doi.org/10.1177/004728751456316).
- Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 271–360). San Diego, CA: Academic.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425–478.
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157–178.
- Wang, D., & Fesenmaier, D. (2013). Transforming the travel experience: The use of smartphones for travel. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism 2013* (pp. 58–69). Berlin, Heidelberg: Springer.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387.

# Innovation-Related Organizational Decision-Making: The Case of Responsive Web Design

Chris Gibbs, Ulrike Gretzel, and Zahra Noorani

**Abstract** The purpose of this paper is to contribute to a growing body of research on the adoption of responsive website design, by studying the related organizational decision making process. Using the Technological, Organizational and Environmental factors (TOE) framework as a theoretical foundation, this exploratory research used semi-structured interviews with US state level destination marketing organizations (DMOs). The findings demonstrate that DMO websites are multifaceted ecosystems and that innovation-related organizational decision-making is too complex but also too accidental to neatly fit within the TOE framework. The findings further question established notions of technology adoption and call for more critical and qualitative research to obtain insights into organizational technology adoption processes.

**Keywords** Web design • Technological Organizational Environment (TOE) • Responsive web design • Technology adoption • Destination marketing organization

## 1 Introduction

Destination marketing organizations (DMOs) have been implementing different mobile optimization technologies (mobile websites, mobile applications and responsive website design) in response to ever greater mobile Internet access by tourism consumers (Google, 2014). While there has been discussion about which optimization technologies are the most effective (Frain, 2012; Designmodo, 2014), responsive websites are emerging as the most widely used by DMOs. Industry tracking reports show that adoption of responsive websites has increased 50 % from 2014 to 2015 while mobile website use has decreased 21 % (Gibbs & Adams,

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2015). Given this rapid shift from one innovation to another, responsive website adoption provides an interesting context in which to study organizational technology adoption in tourism.

While there is a growing body of literature on DMO websites, it does not address the complexities created by an increase in functionality and the growing need to support multi-device use. Prior research which identified DMO websites as mostly enhanced brochures for information provision and promotion (Wang & Fesenmaier, 2006; Yuan, Gretzel, & Fesenmaier, 2003) does not represent website reality in 2015. DMO websites have become communication, interaction and transaction platforms. This increase in the functionality of a DMO website has been further compounded by the use of smartphones and other mobile devices that extend use/uses and change interaction paradigms (Wang, Xiang, & Fesenmaier, 2014; Gretzel, 2011). Due to the complexities created by an increase in functionality in combination with the increased need to consider mobile technology innovations, organizational decision making about website innovation is not sufficiently captured in previous research. Existing research does however recognize that DMOs are continuously implementing and updating website features (Zach, Gretzel, & Xiang 2010), suggesting that Website-related innovation decisions are very important to DMOs.

In this research we sought to investigate the factors that influence the potentially very complex decision to adopt a responsive website. Complex organizational settings within which information technology is adopted are best examined using qualitative research methods (Palvia, Mao, Salam, & Soliman, 2003). Consequently, using qualitative interviews with US state DMO organizations as the method and the TOE (Technology, Organization, and Environment) factors model as the theoretical framework we set out to investigate nuances and complexities in the organizational decision-making process related to adopting responsive Website design.

## 2 Background

### 2.1 DMO Websites

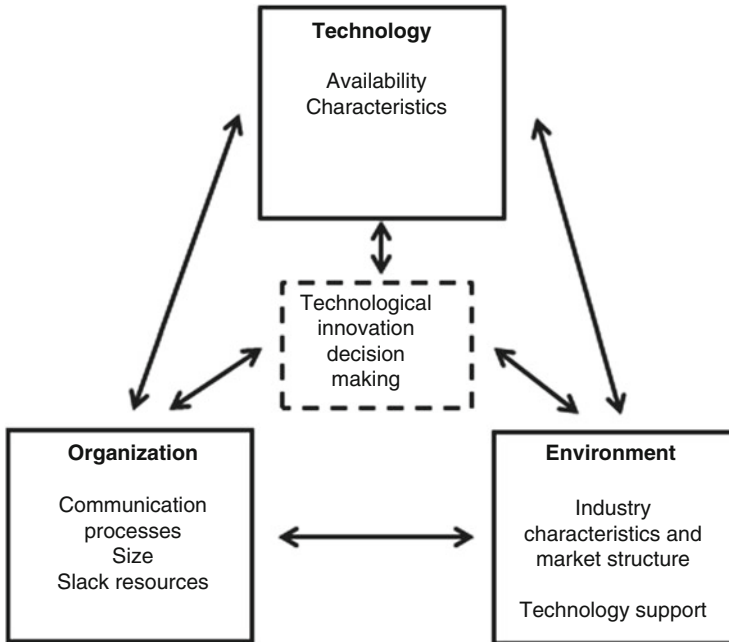
Websites are important marketing communication channels for DMOs with all of these organizations essentially having at least a basic one (Zach, Xiang, & Fesenmaier, 2007). Related to DMO websites, common research topics include evaluation (Li & Wang, 2010; Tanrisevdi & Duran, 2011) and performance (Romanazzi, Petruzzellis, & Iannuzzi, 2011; Xiang, Pan, Law, & Fesenmaier, 2010). In a meta-analysis of destination marketing website success factors, information quality and ease of use were the two most prominent concepts within tourism research (Park & Gretzel, 2007). With travelers increasingly using different devices with different screen sizes during travel planning, ease of use is dependent upon the DMO websites being mobile friendly.

Initially DMO websites were made mobile friendly through the adoption of a separate URL site programmed specifically for the smaller screen sizes found on phones. These mobile websites required the DMO to maintain and post content on two websites and the mobile site typically had less pages and content for the user, creating an issue with information quality. Responsive website design was introduced in 2010 (Marcotte, 2011) and it has demonstrated to be a more effective solution for organizations because the user receives the same information and user friendly experience on a mobile device as they would on a desktop computer. An added benefit to the organization is that they only have to maintain one website URL rather than two. Considering Rogers' (2003) diffusion of innovation theory, the clear comparative advantage of responsive websites over mobile websites should lead to rapid adoption of responsive websites by DMOs. In addition, the importance of DMO websites being mobile friendly became more urgent this year when Google announced Mobilegeddon (Angeles, 2015). On April 21, 2015, Google announced that they updated their algorithms to favor mobile-friendly websites making them appear higher in search rankings, thereby further adding to the advantage of owning a responsive website.

However, not all DMOs have adopted and those who have, have done so with different speed. The divergent adoption of technology innovation by different types of DMOs has been previously reported, but with conflicting findings in terms of the organizational factors that influenced it. A 2006 survey with 143 responses identified that website-related innovation was driven mainly by availability of financial resources and positive leadership attitude (Zach et al., 2010). In contrast, a more recent analysis of 43 US state DMOs found that organizations with lower budgets were 21 times more likely to have adopted a responsive website than those with higher budgets (Gibbs & Gretzel, 2015), painting a picture of flexibility maybe becoming more important than buying power. Either way, website innovation processes by DMOs remain a mystery due to such limited and conflicting findings. Following research that calls for more insights on organizational technology adoption and innovation in tourism (Gibbs & Gretzel, 2015; Zach et al., 2010), this paper seeks to further explore factors that influence such innovation-related decision-making by DMOs.

## ***2.2 Organizational Technology Adoption***

One of the more widely used theoretical frameworks conceptualizing determinants of organizational technology adoption is the Technology Organization Environment framework (Baker, 2012). The TOE framework is an organizational-level theory that helps explain how the context of a firm influences technology adoption decisions. The framework was developed in 1990 (Tornatzky & Fleischer, 1990) and it identifies three aspects of an organization's context that influence the process of technology innovation; technological context, organizational context and environmental context (Fig. 1). The technological context describes internal and



**Fig. 1** Technology, organization, and environment framework (Tornatzky and Fleischer 1990, adapted from Oliveira & Martins, 2011, p. 112)

external technologies relevant and available to the organization. Organizational context identifies factors related to the organizational type, size and management structure. Environmental context represents the industry and market structure in which the organization competes.

The TOE framework has been used to understand different IT adoptions, such as: websites (Oliveira & Martins, 2008), cloud computing (Alshamaila, Papagiannidis, & Li, 2013) and e-business (Oliveira & Martins, 2009). Table 1 presents examples of specific factors used in these previous TOE studies.

One critique of the framework is that it resembles a taxonomy for categorizing variables and does not represent a developed theory or integrated conceptual framework (Dedrick & West, 2003). Another issue with TOE research is the heavy reliance on enumerating factors identified through literature reviews or organizational data that is readily available. As such, the models might not capture organizational realities. The use of qualitative methods provides an opportunity to capture the complexity of IT adoption decisions by an organization (Orlikowski, 1993). The current research therefore sought to not only adopt but also potentially adapt and critically evaluate the usefulness of the TOE framework for the context of DMO website innovation-related processes using a qualitative methodology.

**Table 1** Examples of previous TOE models

Study/Context	Constructs
Cloud Computing Alshamaila et al. (2013)	<i>T</i> :relative advantage, uncertainty, compatibility, complexity, trialability, geo-restriction <i>O</i> :size, top management support, innovativeness, prior technology experience <i>E</i> :competitive pressure, industry, market scope, supplier computing support
Website E-commerce Oliveira & Martins (2009)	<i>T</i> : technology readiness, technology integration, security applications <i>O</i> :perceived benefits of electronic correspondence, IT training programs, access to the IT system of the firm, internet and e-mail norms <i>E</i> :website competitive pressures, e-commerce competitive pressure
EDI adoption Kuan & Chau (2001)	<i>T</i> : perceived direct benefits <i>O</i> : perceived financial cost, perceived technical competence <i>E</i> : perceived industry pressure, perceived government pressure

*T* Technology, *O* Organization, *E* Environment

### 3 Methods/Procedures

Semi-structured phone interviews were used because they can facilitate exploring different factors within the innovation adoption process (Leedy & Ormrod, 2010). In person interviews were not possible due to the time constraints of DMO executives and the great geographical dispersion of these organizations. All 50 US state DMO offices were contacted by phone and e-mail to express an interest in speaking with the individual who is overall responsible for the website. In total, 23 of the 50 state DMOs’ website managers were scheduled for an interview. Because of the relatively recent adoption of responsive website design, all informants were involved in the decision to start a responsive website for the organization. Interviews were between 19 and 50 min, and were recorded and transcribed. The transcripts for the interviews were analyzed looking for emerging factors. The TOE framework was used as a typology to classify the different factors identified. Where possible, the factors were named similarly to factors identified in other TOE studies.

## 4 Results

### 4.1 Overall Adoption

From the 23 organizations contacted 18 had already implemented responsive websites. The dates ranged from March 2010 to May 2015. The five that had not implemented responsive websites had made the decision and were in the process of working with an outside agency to develop the site. The typical design time for a



website was between 6 and 18 months. With the exception of five destinations, they all previously had a mobile website before adopting responsive design. Within the overall adoption process for a responsive website, it was not always a simple uniform decision to adopt or not. While many organizations made a decision that they needed to update their website to meet the needs of the mobile enabled traveler, they had several options to achieve the goal; partial adoption by creating responsive landing pages first, creation of a micro-site that sits outside the organization, develop a mobile website instead or outsource the development of a responsive website to an outside organization. Ultimately they all ended up outsourcing the design and building of the responsive website. While some DMOs have the initial content for a new website managed externally, almost all take over the management of website content once it is up and running.

## 4.2 Technology

*Complexity and Outsourcing* The coding and programming for a responsive website is significantly more challenging than a traditional desktop website. This complexity resulted in all of the organizations to outsource the initial development of the responsive website, while they maintained responsibility for the strategy and content. Only one organization had previously managed all design, development and content responsibilities for their website, but responsive website design caused a shift in this practice:

We hired externally for the first time, we've done our website internally for 20 years, realized [our state] is a very small state, there's not a big Tech industry here so really it is difficult for us to hire the talent required to keep abreast of how fast the web changes and so it really made a lot of sense for us to seek an agency and we did from a Chicago cooperation. They are both building and recommending and they will be helping us with our strategic direction as we move forward (Informant 19).

*Compatibility and Ease of Use* During the decision process to start a responsive website, many destinations were driven by issues related to their existing website and its content management system. The focus was particularly on increasing the website's ease of use for consumers and staff.

initially the project came from taking a look at our backend. It was more so looking at our digital infrastructure which started with our backend. Since we were doing a backend update to our CMS, it made sense, our website hadn't gone through a major kind of re-launch or redesign in 7 or 8 years (Informant 02).

The ease of use for a content management system was even more important when it related to DMOs who allow stakeholder groups the ability to update their own pages on the site.

Mostly it's because for selfish reasons right so the CMS is used by our office. And it's custom built, it's just built on very old technology . . .and like I said earlier it also leads to a lot of the problems with our partners. (Informant 04)

Another ease of use issue identified by many organizations was the elimination of having to manage both a desktop website and a mobile website. The mobile website required double duty on posting content and many visitors complained about the limited content available on them for travel planning purposes.

We were wanting to redo it anyway to get it all unto one platform and to make it all, more manageable. (Informant 15)

### 4.3 Organization

*Scheduled Website Redesign* One of the most common factors in starting a responsive website was the existing DMO websites being out of date and scheduled for a re-design. In fact the driver for relaunching the website was not responsive design, but a course of normal business activity for the DMO. This type of innovation has not been classified or identified before in the literature. This factor suggests that innovation can be part of a regular course of business whereby organizations are continuously updating technology.

We were going to do a site redesign in fiscal year of 14 that was kind of a for sure because the site that we had up to that point had been around since . . . do the math I think since January of 2011 so it was about three years old and we usually like to do a refresh. Then there's new ideas and new technology usually so three ish years is kind of the shelf life for our website and we like to update them with different campaign themes and different creative stuff. We were definitely planning to do a website redesign in fiscal 14 and then we just needed to decide if it should be a responsive site and or how do we integrate the mobile aspects of it. (Informant 07)

*Continuous improvement and key performance indicators* Innovation on organizational websites is driven by key performance indicators. Indicators such as time on site and bounce rate are measures of engagement, while indicators such as unique visits and source of clicks measure traffic. Website managers use reporting tools like Google analytics to regularly track and review the performance indicators to improve the engagement and traffic. When questioning the factors that influence the decision to go to a responsive website, most organizations discussed growth in mobile traffic identified through website monitoring.

I think one huge one was looking at our analytics. So we meet with our agency regularly and we also look at our own analytics and seeing that mobile traffic was becoming more and more of a trend. (Informant 04)

While not mentioned with the same importance as mobile traffic, many organizations expected the responsive site to also improve engagement metrics like time on site and bounce rate. Most DMOs reported improved engagement performance indicators after the launch of a mobile website.

So we just said that we had to make some decisions and we were also seeing bounce rates increase. We were seeing pages viewed dropping. Time on page was dropping. All of your engagement indicators showing that they are really sticking around and viewing more content of all of those were dropping. (Informant 12)

*Management Support* Within the literature about organizational adoption of technology, top management support is frequently discussed, however top management involvement in the decision was limited. One of the key drivers that influenced the decision to start a responsive website came from the staff responsible for the website. The approval process was limited to their direct managers for the purposes of securing the financial resources required.

I think there is a lot of conversation about getting a new website, but we [website staff] were the ones who were saying you know we should be doing this; that really came from us. (Informant 21)

*Budget Reallocation* The source of funding for innovations is a common factor identified within the TOE literature. With responsive websites being reported to cost more than a regular desktop website, it could be assumed that budget or financial resources would be a significant factor. There were different influences identified; reallocation of funds and new funding. Almost all US state based DMOs are funded by the state legislature and therefore have a relatively stable source of funding. Most DMOs experienced no delays in making the decision to start a responsive website because they simply re-allocated funds from their overall budget.

Well, originally we had planned to do most of the work in fiscal year 16 and around January of this year, January, February when we started looking at where our expenditures were going and our budget we realized that we had a trunk of money that was a reasonable amount to go ahead and get started with the new design. (Informant 03)

No, we didn't really increase the funding, we rearranged the funding from other things that we were doing at that time. We put a few things on hold, like I said we had budget to do another mobile site or the discovery trial site, so we used some of the budget that was already allocated for that and it was primarily, I mean there were maybe some slight increases but it was primarily like rearranging what we had already allocated for different projects. (Informant 18)

Organizations that wanted to get new additional base funding to start a responsive site were significantly slower in adoption of a responsive website.

*Prior IT Experience, Staffing and Training* When making a decision to start a responsive website, the staffing and training was not a regularly identified factor in the decision. For the most part, staffing levels did not change with the introduction of a responsive website and it was deemed that existing staff would simply use the new platform to update the website. While staffing and training was part of the process to move towards a responsive website, the experience of staff was not a factor when deciding to start a responsive website.

Actually no increase in staffing. That was one of the things we looked at was not just looking at, okay what will it take to get these sites launched? But maintaining and moving forward, is this flexible enough that the current staff can go in? Do we need to pull in additional resources? How is this going to affect the resource load on the existing team? We found that we didn't have to staff up for any of the entire project. (Informant 02)

#### 4.4 *Environmental Context*

*Supplier Advice* With all DMOs using external agencies to design and program their responsive websites, many learned about the design technique from the agencies that program and host their website or were being considered for website innovation jobs through a formal request for proposal (RFP). While many DMOs spoke to their agency introducing the concept and encouraging them, one discussion with Informant 20 whose DMO was one of the earliest adopters of a responsive website really stuck out. While they were scheduled for a new website, they did not even know what a responsive website was until they started the RFP process.

We're in a middle of all of this and we have designed the RFP and I don't have the details on what we asked for it at that moment. But typically, what we'll do is we'll say, "Here are lists of our needs, here's what we want to accomplish from the website. Let's entertain your responses to this proposal." And one of them came in and said, "What you need to be is responsive." And the committee looked at each other and said, "Responsive, what's that?" (Informant 20)

What was even more interesting was after the organization decided to add a responsive design requirement to the RFP; they received conflicting reports and advise from other agencies submitting the proposal for the work.

we've got a little bit of pushback from some of the people who are responding the RFP because they also weren't that familiar with what this responsive stuff was and they're trying to convince us that we needed something else. And so we finally landed with the contractor that we got and we launched our responsive website in 2012 (Informant 20)

*Industry* While there is conflicting research about the influence of the industry an organization competes in and their adoption of new technology, many conversations indicated that state DMOs watch each other when making technology decisions. There is also evidence for deliberate decisions to wait for others to go first in order to benefit from decreases in cost.

There's an element we got to keep up with our neighbours in a lot of ways. (Informant 14)

What we usually do is let the first adaptors go in there and spend the big money and then as the cost effectiveness of a certain type of new design strategy makes it way down to the more economically friendly, then we step in and we tried to then take pieces of what our competitors are doing and then implement it at a lower cost. (Informant 01)

## 5 Discussion

Using long qualitative interviews with tourism managers who had recently participated in the decision and the process to adopt a responsive website has presented rich data to explore the topic of website innovation by DMOs. The use of TOE as a theoretical grounding has demonstrated the flexibility of the framework to adapt to different contexts and technology. In this study nine different technology adoption

factors were identified; technological (2), organizational (5) and environmental (2). While the specific set of factors has to be viewed as unique to the technology and organizational context (Baker, 2012), the results identified themes in innovation-related organizational decision-making that are of general relevance but have not been acknowledged in the literature.

*Budget Reallocation* Prior research in the technology adoption context speaks to the size of the budget for the organization being a factor in adoption (Gibbs & Gretzel, 2015; Zach et al., 2010; Zach et al., 2007). While budget was a factor, the overall cost was not discussed as much as the process of reallocating to get the responsive site started.

*Scheduled Innovation* Based on previous literature about technology adoption, this factor could not have been predicted. Rather than driven by a mix of TOE factors, the innovation was in many cases simply scheduled.

*Performance Focus* While website performance has been a common topic within tourism literature (Romanazzi, et al., 2011; Stepchenkova, Tang, Jang, Kirilenko, & Morrison, 2010; Xiang et al., 2010), the link to innovation processes has not been explicitly addressed in the literature.

*Innovation Systems* While much research has addressed the importance of websites to DMOs (Pike & Page, 2014), none really acknowledges the complexity of the technology. Websites represent ecosystems of technologies. Consequently, website innovations do not involve isolated innovation decisions. Rather, they are made to support overall goals and might be spurred by needs that emerge from other, not directly related components of the ecosystem, such as lack of ease of use of the CMS. At the same time, this complexity is overwhelming for some DMOs, leading to the reliance on outside expertise. Rather than really adopting, they buy services; innovation is outsourced. Therefore, many organizational factors such as staffing, expertise, etc. are less relevant and top management support is not as crucial.

*Serendipity* TOE research and most other organizational adoption studies also assume that adoption decisions are planned and rational. The current research indicates that this is not always the case.

*Deliberate Delay* While there are clearly pressures to follow peers there is also deliberate waiting. It is not risk avoidance that seems to drive this but rather expectations that prices will drop.

## 6 Conclusions

While the TOE proved useful as an organizing principle, the current research clearly shows that it is dangerous to adopt factors into models without really understanding how they play out in the complex reality of organizational

innovation processes. It is therefore not surprising that previous TOE studies lacked in predictive power or led to contradicting findings. What TOE research is also guilty of is examining technology adoption decisions in isolation. The findings of this qualitative study clearly indicate that responsive website design adoption was embedded in overall website management and connected to other technologies. Further, just looking at whether an organization's website has a certain feature/design or not does not really provide much information in terms of how integrated and therefore driven by organizational factors the innovation is. The findings also hint at extensive processes rather than simple one-point-in-time adoption decisions, which challenges the way existing research has conceptualized and measured technology adoption variables. Future research should further explore organizational technology adoption with such a process view. The practical value of the research lies in revealing the intricate nature of innovation processes in DMOs. This is not only important for consultants offering technologies or strategic innovation advice but also for policy-makers with an interest in fostering innovation in the tourism industry.

## References

- Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, 26(3), 250–275.
- Angeles, S. (2015). Google gives mobile-friendly sites a boost in search ranking. *Business News Daily*. Retrieved from <http://www.businessnewsdaily.com/7808-google-search-ranking-mobile.html>.
- Baker, J. (2012). The technology–organization–environment framework. *Information systems theory* (pp. 231–245). New York: Springer.
- Dedrick, J., & West, J. (2003, December). Why firms adopt open source platforms: A grounded theory of innovation and standards adoption. In *Proceedings of the Workshop on Standard Making: A Critical Research Frontier for Information Systems* (pp. 236–257). Seattle, WA.
- Designmodo. (2014, February 10). The pros and cons of responsive web design vs. mobile website vs. native app [Web log comment]. Retrieved from <http://designmodo.com/responsive-design-vs-mobile-website-vs-app/>
- Frain, B. (2012). *Responsive web design with HTML5 and CSS3*. Birmingham: Packt Publishing Ltd.
- Gibbs, C., & Adams, C. (2015). *DMO mobile readiness*. Toronto: Ted Rogers Institute for Hospitality and Tourism Research.
- Gibbs, C., & Gretzel, U. (2015). *Drivers of responsive website design innovation by destination marketing organizations information and communication technologies in tourism 2015* (pp. 581–592). New York: Springer.
- Google. (2014). *The 2014 traveler's road to decision*.
- Gretzel, U. (2011). Intelligent systems in tourism: A social science perspective. *Annals of Tourism Research*, 38(3), 757–779.
- Kuan, K., & Chau, P. (2001). A perception-based model for EDI adoption in small businesses using a technology–organization–environment framework. *Information & Management*, 38(8), 507–521.

- Leedy, P., & Ormrod, J. (2010). *Practical research: Planning and design* (Vol. 9). London: Pearson.
- Li, X., & Wang, Y. (2010). Evaluating the effectiveness of destination marketing organisations' websites: Evidence from China. *International Journal of Tourism Research*, 12(5), 536–549.
- Marcotte, E. (2011). *Responsive web design: Editions Eyrolles*.
- Oliveira, T., & Martins, M. (2008). A comparison of web site adoption in small and large Portuguese firms. Paper presented at the ICE-B
- Oliveira, T., & Martins, M. (2009). Determinants of information technology adoption in Portugal. Paper presented at the International Conference on e-Business
- Oliveira, T., & Martins, M. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation*, 14(1), 110–121.
- Orlikowski, W. (1993). CASE tools as organizational change: Investigating incremental and radical changes in systems development. *MIS Quarterly*, 17, 309–340.
- Palvia, P., Mao, E., Salam, A., & Soliman, K. (2003). Management information systems research: what's there in a methodology? *Communications of the Association for Information Systems*, 11(1), 16.
- Park, Y., & Gretzel, U. (2007). Success factors for destination marketing web sites: A qualitative meta-analysis. *Journal of Travel Research*, 46(1), 46–63.
- Pike, S., & Page, S. (2014). Destination Marketing Organizations and destination marketing: A narrative analysis of the literature. *Tourism Management*, 41, 202–227.
- Rogers, E. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.
- Romanazzi, S., Petruzzellis, L., & Iannuzzi, E. (2011). Click & experience. Just virtually there. The effect of a destination website on tourist choice: Evidence from Italy. *Journal of Hospitality Marketing & Management*, 20(7), 791–813.
- Stepchenkova, S., Tang, L., Jang, S. S., Kirilenko, A. P., & Morrison, A. M. (2010). Benchmarking CVB website performance: Spatial and structural patterns. *Tourism Management*, 31(5), 611–620.
- Tanrisevdi, A., & Duran, N. (2011). Comparative evaluation of the official destination websites from the perspective of customers. *Journal of Hospitality Marketing & Management*, 20(7), 740–765.
- Tornatzky, L., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington, Massachusetts: Lexington Books.
- Wang, Y., & Fesenmaier, D. (2006). Identifying the success factors of web-based marketing strategy: An investigation of convention and visitors bureaus in the United States. *Journal of Travel Research*, 44(3), 239–249.
- Wang, D., Xiang, Z., & Fesenmaier, D. (2014). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research*, 48, 11–26.
- Xiang, Z., Pan, B., Law, R., & Fesenmaier, D. (2010). Assessing the visibility of destination marketing organizations in Google: A case study of convention and visitor bureau websites in the United States. *Journal of Travel & Tourism Marketing*, 27(7), 694–707.
- Yuan, Y. L., Gretzel, U., & Fesenmaier, D. R. (2003). Internet technology use by American convention and visitors bureaus. *Journal of Travel Research*, 41(3), 240–255.
- Zach, F., Gretzel, U., & Xiang, Z. (2010). Innovation in the web marketing programs of American convention and visitor bureaus. *Information Technology & Tourism*, 12(1), 47–63.
- Zach, F., Xiang, Z., & Fesenmaier, D. (2007). An assessment of innovation in web marketing: Investigating American convention and visitors bureaus. *Information and Communication Technologies in Tourism, 2007*, 365–376.

# Mapping Mobile Touchpoints in Sport Events

Alessandro Inversini, Jason Sit, and Harry T. Pyle

**Abstract** Today's customers seemingly desire company and brands to be constantly in contact with them during the consumption journey. By consequence forward-looking companies and brands are increasingly embedding technology-enabled (often mobile) touchpoints into the consumption journey in order to establish a relationship with consumers and support their needs and wants. This research analysed the consumption journey of sport events, and identified five major categories of activities performed by sport fans: sensing, performing, linking, organizing and navigating. These major activity categories, which can be seen as relationships co-creation between companies/brand and their customers, are then assessed in terms of the possibility of being enabled or enhanced with mobile devices thus creating mobile touchpoints.

**Keywords** Mobile technology • Mobile touchpoint • Customer experience • Sport marketing

## 1 Introduction

Statistic shows that only in the UK, 62 % consumers own a smartphone and 36 % own a tablet (Deloitte, 2014): this clearly conveys the global growth and ubiquity of mobile technologies ownership (Wilken & Goggin, 2013). Mobile technologies allow users to perform various activities *on the move* and, due to their wide availability, continuously improved interfaces, and easy access to data, they have also changed the way we work, learn, spend leisure time and interact socially (McNaughton & Light, 2013). Additionally, mobile technologies allow us to constantly engage with brands and retailers-and vice versa-via a series of touchpoints: Baron (2008) called this phenomenon “always on”. A touchpoint refers to “a point of contact/ communication between an organisation and an individual consumer” (Jenkinson, 2007, p. 165). Many variations of definitions exist, whereby some like Jenkinson's describe what touchpoints signify, others elaborate further by explaining how and when touchpoints occur in the customer

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experience cycle (Dhebar, 2013). By understanding the variety of touchpoints which can create a connection with the consumer, businesses can strategically and effectively focus their efforts on designing and delivering memorable experience at each one touchpoint (Dhebar, 2013).

Whilst making a purchase, consumers go through what is known as a consumption journey that consists of three broad stages: *before*, *during*, and *after* and they may have different information needs within each and every phase (Gretzel, Fesenmaier, & O'Leary, 2006). Whereas consumers use mobile devices to satisfy information needs, organise and perform personal and social activities, marketers use mobile devices as a marketing channel (Persaud & Azhar, 2012). Therefore, capitalising on the ubiquitous ownership and frequent usage of mobile devices, marketers can create value-added brand experiences, or stimulate consumers' engagement with a brand, to foster continuous brand-customer relationships using mobile touchpoints.

This is especially true in the sport event domain, where to maintain or increase revenue intake and membership growth memberships' added-value experiences are often emphasised (Yoshida, James, & Cronin, 2013). Avid sport fans usually have favourite sport team/s and often invest considerable amount of money, time, and effort in nurturing relationship with and executing their devotion to that team/s. For instance, avid football fans—and especially fanatics—will attend every match played by their favourite club/s, regardless of whether the match takes place locally or internationally. A mobile device such as a smartphone naturally becomes an ideal channel that allows avid sport fans to “be connected” to their favourite team/s, constantly and flexibly (Wilken & Goggin, 2013).

A consumption-journey map depicting when and how sport fans engage their favourite sport team/s via the smartphone will shed light on the utility of this mobile device in delivering added-value experiences and thus will provide sport organisations or sport marketers with actionable insights. Furthermore this will enhance the relationship co-creation possibilities between the actual brand/organization and the customers. This research, therefore, will examine mobile touchpoints associated with the smartphone device, in the context of sport events, and from the perspectives of sport fans.

## 2 Theoretical Background

The theoretical foundation of this research is underpinned by three domains: (1) the concept of touchpoints, (2) the concept of mobile touchpoints, (3) the consumer journey. The research has then been carried out in the context of sport events. Each of these concepts and the context is discussed in details next.

## **2.1 Touchpoints**

A systematic review of the relevant literature of touchpoints revealed that the definitions consistently involve words or phrases describing when a consumer “interacts” (e.g. Dhebar, 2013; Khambete, 2011; Martin, Rankin, & Bolinger, 2011), “touches or connects” (TouchPoint Experience, 2004), “engages” (Merholz, 2009; Ojiako, Chipulu, & Graesser, 2012) or has a “point of contact” (Jenkinson, 2007; Meyer & Schwager, 2007) with the business, organisation or brand. Some definitions offer more details as to the context of a touchpoint; a call centre, an actual product or a member of staff (Brigman, 2005; Merholz, 2009), and others expand by giving touchpoints a timescale describing the stages (i.e. before, during, and after) that touchpoints occur within the customer’s experience cycle (Dhebar, 2013; TouchPoint Experience, 2004). whilst a few definitions favour the perspective of one-off transaction (Khambete, 2011; Merholz, 2009; Meyer & Schwager, 2007; Ojiako et al., 2012), and most definitions employ the relational perspective (Brigman, 2005; Dhebar, 2013; Jenkinson, 2007; TouchPoint Experience, 2004). More specifically, the relation-oriented definitions typically focus on how touchpoints are used by businesses as communication channels to foster relationships with customers. Synthesising the various definitions mentioned earlier whereby each has its pros and cons, this study proposes a more comprehensive definition of touchpoints:

Any interaction, engagement or point of contact that a consumer has with a business, a brand or a service provider before, during and after the service or product consumption journey.

This definition connotes a touchpoint as an interaction with a business or a brand, and represents a unique experience within the customer experience journey. Multiple and interrelated touchpoints occur because the consumer experience journey involves before, during, and after consumption stages (Clatworthy, 2011; Teboul, 2006). Ensuring each touchpoint meets customers’ needs is vital to deliver an added-value experience in the consumer journey (Dhebar, 2013).

## **2.2 Touchpoints and Mobile Technology**

Usage of mobile technology is now ubiquitous in consumers’ daily routines (Koszalka & Ntloedibe-Kuswani, 2010), with smartphone users generally spending over four hours a day with their device, and for instance, teenagers were reported in 2013 to send over 30 text messages daily (McNaughton & Light, 2013). Constant innovation in mobile technology has provided business with new or innovative opportunities of interacting and servicing their customers. The strategic benefits of mobile technology, such as connectivity, flexibility, interactivity and location awareness, need to be considered thoroughly by businesses (Sheng, Nah, & Siau, 2005). With consumers becoming more dependent on mobile technology, they

increasingly expect seamless and synchronised experiences, as well as instant connection with businesses or brands through various touchpoints (Stone, 2012). Consumers nowadays, indeed, expect to have access to information, resources and services of a business or a brand wherever and whenever they desire (Van Steenderen, 2000). Ultimately, people's rising dependency on mobile technology as an essential lifestyle device has stimulated businesses to create touchpoints that engage customers interactively and that enables customers to perform various transactional activities efficiently and, over time, that foster customers' stickiness to the business or the brand (Suki, 2011).

This notion is supported by Korn and Pine's (2011) typology of human capability, which postulates that digital technology, including mobile technology, can essentially and effectively support humans or brands in fulfilling four broad experiential purposes: *sensing* (an individual connecting with a brand interactively), *linking* (an individual connecting or networking with other like-minded individuals simultaneously); *performing* (an individual carrying out functional activities independently such as comparing prices or placing an order); and *organising* (an individual performing functional activities with other individuals collectively such as teleconferencing with colleagues from varied countries).

Korn and Pine's (2011) typology is highly pertinent to this study as it encapsulates the inevitability and versatility of a smartphone in changing and supporting present-day consumers' existence. Present-day consumers 'need' their smartphones, akin to they need food, water and oxygen, for survival on a daily basis (Aquino, 2012). Forward looking businesses or brands leverage this smartphone-dependency phenomenon by creating mobile touchpoints that add experiential value to a commercial transaction and that foster continual and interactive relationships with their customers (Grönroos & Ravald, 2011). Businesses or brands that deliver added experiential value and engaging relationships via mobile touchpoints effectively are those likely to attract higher number of 'sticky' customers and greater amount of revenues (Aquino, 2012).

### **2.3 Mobile Touchpoints and Consumption Journey**

A consumption journey describes the before, during, and after stages that individuals go through in a consumption process (Clatworthy, 2011; Teboul, 2006). Each consumption stage involves the occurrence of numerous experiential activities (e.g. researching, communicating, and transacting—Carù & Cova, 2003; Mehmetoglu & Engen, 2011). Aligning the experiential activities of a consumption stage with consumers' needs (Gretzel et al., 2006—e.g. information/knowledge needs, sensory needs, efficacy needs, and social needs) can provide a source of competitive advantage, as discussed by Carù and Cova (2003). In every consumption stage, mobile touchpoints can be introduced to facilitate the delivery of the experiential activities and can also be deployed to foster business-customer relationships (Brigman, 2005; Liu, Sparks, & Coghlan, 2014; Merholz, 2009).

The model of Consumer Decision Journey (CDJ—Court, Mulder, Elzinga, & Vetvik, 2009) emphasises business-customer relationships as a unique source of competitive advantage that can transform a buying process from being rational to relational. According to the CDJ model, a typical consumer buying process consists of six sequential stages: consider, evaluate, buy and enjoy, advocate, and bond. Depicted by outer and inner loops, the CDJ model proclaims that a business-customer bond will shrink or simplify the sequential buying cycle and catapult customers into the buy stage in future purchases, and this bond will derive from consumers' enjoyment and advocacy associated with the purchase (Hudson & Thal, 2013).

## ***2.4 Mobile Touchpoints and Sport Consumption***

Sport consumption represents an essential part in people's lives and in Great Britain, it is indeed ingrained in the national identity and culture (Weed, 2009). Sport organisations that understand and integrate sport fans' interests into the planning and execution of marketing strategies are naturally more likely to achieve greater financial successes than those that fail to do so (Kiremitci, Demiray, Aycan, & Gençer, 2014). Forward thinking sport organisations often actively communicate, listen, and respond to fans' interests and desires in order to build long-term relationships and loyal behaviours (Bee & Kahle, 2006). The supportive behaviour of loyal sport fans go beyond purchasing from the sponsors of their favourite sport organisation or team (Kim, Trail, & Ko, 2011); it also include the desire to constantly engage with the sport organisation or team, either physically, digitally or a mixture of both (Barr, Pennycook, Stolz, & Fugelsang, 2015; Lee, Chang, Lin, & Cheng, 2014). The literature mentions that highly-involved fans frequently partake in events and actively peruse news related to their favourite team/s. Mobile technology such as a smartphone serves as an ideal device that enables loyal fans to "be connected" with their idolised sport organisation or team at any time in any place.

Mobile touchpoints represent an essential part of the present-day sport consumption journey whereby they enable fans to use time and resources (e.g. money and efforts) in ways that improve their lives, extend their current capabilities, pursue personal interest, and enable them to do things on the move in which they otherwise would not be able to do without mobile touchpoints (Korn & Pine, 2011). Yet, there has been scarce attention on how and when mobile touchpoints occur in the present-day sport consumption journey and thus this study aims to address this gap in the extant sport literature.

### 3 Methodology

This study seeks to identify and map mobile touchpoints arisen in the present-day sport consumption journey. This study is particularly interested in the mobile touchpoints that link to smartphone usage, in the context of football events, and from the perspectives of football fans. Aimed to “seed” a larger study, this study opted for an inductive approach and convergent interviews, which are usually semi-structured and as the number of interviews and quality of data develops, the interview questions become more focused or refined to identify agreements and disagreements between participants (Williams & Lewis, 2005). The interviewing process ceases when patterns of agreements and disagreements are saturated amongst all or most of the participants and explanations are identified for the agreements and disagreements. Convergent interviewing allows the researcher to refine a probing question/s after each interview in order to interrogate or clarify an agreement or disagreement and seek possible explanation/s (Rao & Perry, 2003).

Judgment and snowball sampling were used to recruit eligible participants for this study. An eligible participant was defined as: (1) any football fan that has attended 20 or more professional matches within the last calendar year and (2) a member of the millennial generation (between the early 1980s and the early 2000s—assuming a millennial has more confidence with smartphones). A total of 15 interviews were conducted and each lasted between 17 and 34 min. Each interview was fully transcribed. Using Nvivo, the interview transcripts were subjected to thematic analysis which involved descriptive and topic coding. More specifically, the profile of the 15 participants was coded by age, gender, years of fan experience (commitment), level of fanaticism associated with football, and efficacy and frequency associated with smartphone usage (descriptive coding). Next, for each stage of the football consumption journey, a list of activities was compiled based on the topics discussed (topic coding). Then, an activity was coded as ‘mobile-enhanced’ (M-E) when more than half of the participants agreed that they often completed that activity using a smartphone (descriptive coding). Then, using Korn and Pine (2011) typology of human capability and other framework (e.g. the navigation information need by Gretzel et al., 2006), the relationships among the topics identified were examined and further coded (topic coding).

## 4 Results

### 4.1 *Participants’ Profile*

The participants exhibit a high degree of sport fanaticism as revealed by their emotional fluctuation when talking about their favourite team’s victory or defeat; they also prove to be very knowledgeable and analytical with every match that their favourite team plays in. Participants, on average, are quite confident and proficient

with using mobile devices. They explain mobile devices as a more effective tool for linking family and friends than for shopping and organising one's calendar. The majority of the participants use the smartphone frequently or very frequently. Only two participants describe themselves as irregular or occasional smartphone users (i.e. on a likert scale). This finding further illustrates the escalating smartphone dependency amongst today's consumers as an essential lifestyle tool (Park, Kim, Shon, & Shim, 2013).

## ***4.2 Consumption Activities Before a Football Event***

The topical coding identified 21 different activities that fans frequently engage before a football match. These were grouped into five major categories: linking, sensing, organising, performing (Korn & Pine, 2011) and navigation (Gretzel et al., 2006). Each category listed can be labelled as "mobile dependency" when three or more of its defining activities are identified as M-E. Out of the 21 activities identified, 12 are labelled as mobile enhanced (M-E) before a football event.

The "Linking" category can be coded as "mobile dependency" because all three of its activities are identified as M-E in nature. This finding exemplifies the increasing dependency on mobile devices such as smartphones for socialising and communicating with other people (Bicen & Arnavut, 2015). Mobile devices like smartphones are valued for providing connection to others (Walsh, White, Cox, & Young, 2011) and staying in contact with others constantly. Campbell (2013) also explained the popularity of mobile devices as a social networking tool can be attributed to its capability of linking its user with other individuals while on the move. For instance, while travelling to a football match, fans can use a smartphone to exchange messages with friends via WhatsApp or share comments or pictures with other fans on Facebook.

"Organising" is another mobile dependency category. Korn and Pine (2011) note that better management capability is highly desired by modern-day consumers, and this capability includes managing one's work and personal lives. A smartphone represents a 'one-stop personal organiser' which sport fans can access an array of mobile-friendly websites and applications in order to diarise various activities to take place for various dates such as, for example, pre-booking a train ticket for a game, setting up a to-do-list for a social event or arranging direct debit for a membership subscription.

Eight activities are identified to represent the "Performing" category and they are equally split between M-E and non-M-E oriented. After a lengthy discussion and the consideration of varied data sources, the researchers of this study have agreed that the "Performing" category should be coded as mobile dependent. Secondary data has reinforced the prevalence of smartphone dependency in the consumption context of sport events whereby it consistently reports the growing usage of smartphones to perform functional activities by sport fans (Jae-Pil Ha, Kang, & Jaehyun Ha, 2015; Kang, Ha, & Hambrick, 2015). The M-E "Performing"

**Table 1** Consumption activities *before* a football event

Activities	Major Category
1. Upload or Take Photos	Linking
2. Take Snapchat or Videos	
3. Meet Friends	
1. Food & Drink	Sensing
2. Watch Another Live Match Before	
3. Go to the front to Watch the Players	
4. Look around the Local Area	
1. Buying a Ticket	Organising
2. Choose Transport	
3. Booking a Taxi	
4. Get Money out at a Cash Machine	
1. Pick Up Tickets	Performing
2. Check Team News	
3. Check Social Media	
4. Betting	
5. Purchase a Programme	
6. Visit the Club shop	
7. Transferring Money	
8. Go Shopping	
1. Make way to the Stadium	Navigation
2. Walk to Near the Ground	

activities identified in this study include being able to check team news, to follow their team on social, and to learn about the details of the home and away matches played their team (see Table 1).

The “Navigation” category consists of two activities that are M-E oriented and thus is coded as mobile dependent. Before the development of the satellite and mobile technologies, navigation would have been performed using a print map. Nowadays mobile devices such as smartphones are widely equipped with a web mapping application (e.g. Google Maps) that offers satellite imagery, street maps, real-time traffic conditions, and route planning for various travelling modes (e.g. by car, foot, or public transportation—Goggin, 2012). Because of this embedded satellite technology and its versatility, sport fans increasingly employ mobile devices as a navigation tool, as illustrated by this study. For example, sport fans use their smartphones when driving to an away match or finding the quickest route from a train station to the stadium (see Table 1). The sensing category has not been classified as mobile depended nor the activities defined within the category have been identified as mobile enhanced.

**Table 2** Consumption activities *during* a football event

Activities	Major category
1. Checking Messages	Linking
1. Food & Drink	Sensing
2. Singing & Chanting	
1. Making Other Arrangements	Organising
1. Take Photos or Videos	Performing
2. Check Other Scores	
3. Check Social Media	
4. Betting	
5. Go To The Toilet	
6. Read the Programme	
7. Read Club Website	
No Navigation Activities were Performed During the Match	Navigation

### 4.3 Consumption Activities During a Football Event

Eleven activities were identified to take place during a football event. In comparison with the *before* stage, the number of activities associated with the *during* stage is less extensive and a possible explanation is related to the fact that when the sport event is taking place and that fans are prohibited from re-entering the stadium if they have exited. The eleven activities can be grouped into the five categories proposed above and six of these activities are coded as M-E in nature (see Table 2).

M-E activities primarily occur in the “Linking”, “Organising”, and “Performing” categories and they include: checking personal messages, contacting other people and/or arranging appointments; taking photos or videos; checking match scores; checking social media; and betting or reviewing bets on the match. Whilst the sequence of how or when these activities take place may vary from one participant to another, these activities all take place via the use of a smartphone and this finding further signals the smartphone dependency *during* a football event.

### 4.4 Consumption Activities After a Football Event

A total of 18 activities were identified to constitute the consumption stage *after* a football event. Thirteen activities are coded as M-E and tend to occur in the category of “Linking”, “Sensing”, “Organising”, “Performing”, and “Navigation” (see Table 3).

In “Linking”, the participants frequently use their smartphones to interact with other fans, usually via social media, and to take photos and/or videos. In “Sensing”, the participants listen to the radio for the match’s commentary using their smartphones. In “Organising”, mobile-enhanced activities include checking the



**Table 3** Consumption activities after a football event

Activities	Major Categories
1. Talk to Other Fans	Linking
2. Meet Friends	
3. Take Snapchats/Videos	
1. Play Music	Sensing
2. Listen to the Radio	
1. Check Train Times	Organising
2. Make Other Arrangements	
1. Check Other Scores	Performing
2. Betting	
3. Check Social Media	
4. Go To A Pub	
5. Go To A Restaurant	
6. Go To Another Location	
7. Watch Replays & Analysis Videos	
8. Go To The Toilet	
9. Watch another Live Match on TV in a pub/bar	
10. Wait for the Players after the Match	
1. Use Google Maps	Navigation

train timetable and arranging a get-together with friends while on the move. “Performing” consists of more M-E activities than other categories and these activities include checking the team’s scores on social media and/or via other mobile application, sharing personal comments on social media, and watching replays and commentary videos. “Navigation” consists of one M-E activity, which involves the participants using Google Maps for their journey returning to home or to a social event.

## 5 Conclusions

Exploratory in nature, this study proposes five activity categories relevant for mapping the consumption journey of a sport event, namely, “sensing”, “linking”, “performing”, “organising”, and “navigating”. These five activity categories extend the work of Korn and Pine (2011) and Gretzel et al. (2006). In their typology of human capability, Korn and Pine (2011) theorize present-day consumers, as individuals and in groups, employ mobile technology to fulfil two primary purposes: connecting; and doing. Individuals and groups connect by sensing and linking respectively; they manipulate their surrounding environments by performing and organising. Gretzel et al. (2006) postulate that users have different information need during the consumption of a product: among the others, navigation has been found to complement with Korn and Pine’s experiential activities (2011). These five

activity categories are applicable across the three broad stages constituting the consumption journey of a sport event, namely, before, during, and after an event. Activities within the activity categories represent the possibility for a given company or brand to establish or sustain a relationship with its customers by addressing the needs and wants they have in that specific moment.

Furthermore, the research shades light on the possibility of enhancing these activities with mobile devices to tackle needs and wants on the spot, thus creating mobile touchpoints. Based on the perspectives of avid sport fans from the millennial generation, the extent of mobile enhancement and dependency is less than consistent or predictable across all five activity categories and across all three consumption stages. Instead, mobile enhancement and dependency, for the time being, primarily occur in: “Linking” and “Performing” before, during, and after a sport event; “Organising” before and after the event; and “Navigation” during and after the event. Mobile dependency is less applicable to “Sensing” across the three consumption stages.

Lastly, mobile touchpoints can be therefore defined as moments of engagement, interaction or contact that a consumer has with a business, a brand or a service via any mobile devices before, during and after the service or product consumption journey and that enhance users’ possibility to link, perform, organize, navigate and sense the reality. Whilst mobile touchpoints are yet to completely monopolise the consumption journey of a sport event, our dependence on their utilities are inevitable and escalating.

## References

- Aquino, J. (2012). Tablets and Smartphones transform the in-store customer experience. *CRM Magazine*, 16(1), 17.
- Baron, N. (2008). *Always on: Language in an online and mobile world*. Oxford: Oxford University Press.
- Barr, N., Pennycook, G., Stolz, J. A., & Fugelsang, J. A. (2015). The brain in your pocket: Evidence that Smartphones are used to supplant thinking. *Computers in Human Behavior*, 48, 473–480. doi:10.1016/j.chb.2015.02.029.
- Bee, C. C., & Kahle, L. R. (2006). Relationship marketing in sports: A functional approach. *Sport Marketing Quarterly*, 15(2), 102–110.
- Bicen, H., & Amavut, A. (2015). Determining the effects of technological tool use habits on social lives. *Computers in Human Behavior*, 48, 457–462.
- Brigman, H. (2005). *Improving customer relationships: Beyond the buzz*. Retrieved September 7, 2015, from <http://www.crmnewz.com/improving-customer-relationships-beyond-the-buzz-2005-04>
- Campbell, S. W. (2013). Mobile media and communication: A new field, or just a new journal? *Mobile Media & Communication*, 1(1), 8–13.
- Carù, A., & Cova, B. (2003). Revisiting consumption experience a more humble but complete view of the concept. *Marketing Theory*, 3(2), 267–286.
- Clatworthy, S. (2011). *Service innovation through touch-points : Development of an innovation toolkit for the first stages of new service development* (pp. 15–28). Retrieved from <http://brage.bibsys.no/xmlui/handle/11250/92984>

- Court, D., Mulder, S., Elzinga, D., & Vetvik, O. (2009). The consumer journey. *McKinsey Quarterly*. Retrieved from [www.mckinseyquarterly.com/The\\_consumer\\_decision\\_journey\\_2373](http://www.mckinseyquarterly.com/The_consumer_decision_journey_2373)
- Deloitte. (2014). *The Deloitte consumer review: Digital predictions 2014*. Deloitte United Kingdom.
- Dhebar, A. (2013). Toward a compelling customer touchpoint architecture. *Business Horizons*, 56(2), 199–205. doi:10.1016/j.bushor.2012.11.004.
- Goggin, G. (2012). *Cell phone culture: Mobile technology in everyday life*. London: Routledge.
- Gretzel, U., Fesenmaier, D., & O'Leary, J. T. (2006). The transformation of consumer behaviour. In D. Buhalis & C. Costa (Eds.), *Tourism business frontiers: Consumers, products and industry* (pp. 9–18). Burlington, MA: Elsevier.
- Grönroos, C., & Ravald, A. (2011). Service as business logic: Implications for value creation and marketing null. *Journal of Service Management*, 22(1), 5–22.
- Hudson, S., & Thal, K. (2013). The impact of social media on the consumer decision process: Implications for tourism marketing. *Journal of Travel & Tourism Marketing*, 30(1-2), 156–160.
- Jae-Pil Ha, Kang, S. J., & Jaehyun Ha. (2015). A conceptual framework for the adoption of Smartphones in a sports context. *International Journal of Sports Marketing & Sponsorship*, 16(3), 161–178.
- Jenkinson, A. (2007). Evolutionary implications for touchpoint planning as a result of neuroscience: A practical fusion of database marketing and advertising. *Journal of Database Marketing & Customer Strategy Management*, 14(3), 164–185.
- Kang, S. J., Ha, J.-P., & Hambrick, M. E. (2015). A mixed-method approach to exploring the motives of sport-related mobile applications among college students. *Journal of Sport Management*, 29(3), 272–290. doi:10.1123/jsm.2013-0065.
- Khambete, P. (2011). A pattern language for touch point ecosystem user experience: A proposal. In *Proceedings of the 3rd International Conference on Human Computer Interaction* (pp. 68–74). New York, NY: ACM.
- Kim, Y. K., Trail, G., & Ko, Y. J. (2011). The influence of relationship quality on sport consumption behaviors: An empirical examination of the relationship quality framework. *Journal of Sport Management*, 25(6), 576–592.
- Kiremitci, O., Demiray, E., Aycan, A., & Gençer, R. T. (2014). Assessing the validity and reliability of the sport consumption behavior scale on Turkish football spectators. *Pamukkale Journal of Sport Sciences*, 5(2), 11–20.
- Korn, K., & Pine, B. (2011). The typology of human capability: A new guide to rethinking the potential for digital experience offerings. *Strategy & Leadership*, 39(4), 35–40. doi:10.1108/10878571111147396.
- Koszalka, T. A., & Ntloedibe-Kuswani, G. S. (2010). Literature on the safe and disruptive learning potential of mobile technologies. *Distance Education*, 31(2), 139–157. doi:10.1080/01587919.2010.498082.
- Lee, Y.-K., Chang, C.-T., Lin, Y., & Cheng, Z.-H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior*, 31, 373–383.
- Liu, W., Sparks, B., & Coghlan, A. (2014). Mapping customer experiences: An examination of touchpoints and opportunities for enhancement. *CAUTHE 2014: Tourism and Hospitality in the Contemporary World: Trends, Changes and Complexity*, 996
- Martin, A. M., Rankin, Y. A., & Bolinger, J. (2011). Client touchpoint modeling: Understanding client interactions in the context of service delivery. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 979–982). New York, NY: ACM.
- McNaughton, D., & Light, J. (2013). The iPad and mobile technology revolution: Benefits and challenges for individuals who require augmentative and alternative communication. *Augmentative and Alternative Communication*, 29(2), 107–116. doi:10.3109/07434618.2013.784930.

- Mehmetoglu, M., & Engen, M. (2011). Pine and Gilmore's concept of experience economy and its dimensions: An empirical examination in tourism. *Journal of Quality Assurance in Hospitality & Tourism*, 12(4), 237–255.
- Merholz, P. (2009). A framework for building customer experiences. Retrieved August 19, 2015, from <https://hbr.org/2009/06/a-framework-for-building-custo>
- Meyer, C., & Schwager, A. (2007). Understanding customer experience. Retrieved August 19, 2015, from <https://hbr.org/2007/02/understanding-customer-experience>
- Ojiako, U., Chipulu, M., & Graesser, A. (2012). Correlating service touch-point preferences with engagement parameters. *Industrial Management & Data Systems*, 112(5), 766–785. doi:10.1108/02635571211232334.
- Park, N., Kim, Y.-C., Shon, H. Y., & Shim, H. (2013). Factors influencing smartphone use and dependency in South Korea. *Computers in Human Behavior*, 29(4), 1763–1770. doi:10.1016/j.chb.2013.02.008.
- Persaud, A., & Azhar, I. (2012). Innovative mobile marketing via smartphones: Are consumers ready? *Marketing Intelligence & Planning*, 30(4), 418–443.
- Rao, S., & Perry, C. (2003). Convergent interviewing to build a theory in under-researched areas: principles and an example investigation of Internet usage in inter-firm relationships. *Qualitative Market Research: An International Journal*, 6(4), 236–247.
- Sheng, H., Nah, F. F.-H., & Siau, K. (2005). Strategic implications of mobile technology: A case study using value-focused thinking. *The Journal of Strategic Information Systems*, 14(3), 269–290.
- Stone, D. (2012). Mobile—More than a magic moment for marketers? *Journal of Direct Data and Digital Marketing Practice*, 13(4), 280–294.
- Suki, N. M. (2011). A structural model of customer satisfaction and trust in vendors involved in mobile commerce. *International Journal of Business Science & Applied Management*, 6(2), 17–30.
- Teboul, J. (2006). *Service is front stage: Positioning services for value advantage*. Basingstoke: Palgrave Macmillan.
- TouchPoint Experience. (2004). *TouchPoint experience*. TouchPoint Experience LLC. Retrieved from <http://www.touchpointexperience.com>.
- Van Steenderen, M. (2000). *Business applications of WAP*. Retrieved from [http://reference.sabinet.co.za/sa\\_epublication\\_article/info\\_v2\\_n1\\_a3](http://reference.sabinet.co.za/sa_epublication_article/info_v2_n1_a3)
- Walsh, S. P., White, K. M., Cox, S., & Young, R. M. (2011). Keeping in constant touch: The predictors of young Australians' mobile phone involvement. *Computers in Human Behavior*, 27(1), 333–342.
- Weed, M. (2009). Sport, tourism and lifestyles. *Journal of Sport & Tourism*, 14(4), 225–227.
- Wilken, R., & Goggin, G. (2013). *Mobile technology and place*. London: Routledge.
- Williams, W., & Lewis, D. (2005). Convergent interviewing: A tool for strategic investigation. *Strategic Change*, 14(4), 219–229.
- Yoshida, M., James, J. D., & Cronin, J. J., Jr. (2013). Sport event innovativeness: Conceptualization, measurement, and its impact on consumer behavior. *Sport Management Review*, 16(1), 68–84.

# Who Uses Mobile Apps Frequently on Vacation? Evidence from Tourism in Switzerland

Michael Beier and Annika Aebli

**Abstract** Mobile applications which are installed and executed on smartphones (so called “mobile apps”) are currently an intensively debated topic in tourism. Mobile apps provide various potentials for applications in the industry as they enable tourism organizations to provide better services to their customers. Also, they allow tourists special travel experiences which significantly add value to their travel activities. Using a survey of 1562 tourists in Switzerland we analyse influences of five different person-related factors on tourist’s propensity for frequent use of mobile apps on their vacation. Our results show that the general propensity to use internet on holidays corresponds with the propensity to use mobile apps on vacation. In contrast, age and a foreign origin of tourists are negatively related to the propensity to use mobile apps on vacation.

**Keywords** Mobile apps • Technology adoption • User behaviour • Customer segmentation

## 1 Introduction

Mobile technologies and especially applications which are installed and executed on smartphones (so called “mobile apps”) are currently an intensively debated topic in tourism (Dickinson et al., 2014; Law, Buhalis, & Cobangoglu, 2014; Wang, Park, & Fesenmaier, 2012). Mobile apps provide various potentials for applications for tourists and travellers, including booking features, information provision and intense interaction channels with diverse tourism services (Oh, Lehto, & Park, 2009). On the one hand, on the basis of mobile technologies tourism organisations are able to provide better services to their customers like location based services and interactive search tools (Anacleto, Figueiredo, Almeida, & Novais, 2014; Wang et al., 2012). On the other hand, mobile technologies allow guests special

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travel experiences which add new customer value to travel activities (Minazzi & Mauri, 2015). Accordingly, it is not surprising that in recent years much effort has been expended to develop and to provide appropriate mobile services in the tourism industry (Law et al., 2014). However, although already a significant amount of empirical work on mobile apps has been published, until now there is only limited empirical evidence on the question: What kind of people use mobile apps frequently on vacation? Some research on mobile apps in tourism rather focusses on the question, how tourists use mobile apps and how mobile apps affect their behaviour and travel experience (e.g., Minazzi & Mauri, 2015; Wang et al., 2012). Other research follows technology acceptance models to explain under what conditions mobile apps are used by tourists (e.g., Kim, Park, & Morrison, 2008; Nickerson, Austreich, & Eng, 2014; Oh et al., 2009). However, classical models of technology acceptance have some weaknesses in respect to tourism and travel context, especially if practical recommendations are to be derived. Therefore, tourism research asks for more comprehensive studies including external variables like demographics and social influences (Kim et al., 2008) as well as additional cognitive variables like previous ICT-experience (Oh et al., 2009). The present study follows this call.

## 2 Theory and Hypotheses

The original technology acceptance model aimed to provide an explanation of the determination of computer acceptance generally. It was developed to predict the technology acceptance of individual system use in the workplace (Davis, 1989) and it has been applied in many online and business contexts to evaluate user perceptions of system use and the probability of new system adoption (Featherman & Pavlou, 2003; Pavlou, 2001). According to the model, perceived ease of use and perceived usefulness are important factors that determine a user's attitude toward intention to use and actual use of an information system (Adams, Nelson, & Todd, 1992). More comprehensive models of technology adoption also included perceived risk into the approach (Featherman & Pavlou, 2003; Fu, Farn, & Chao, 2006). Following the technology acceptance model and its successors current empirical research applies the theoretical terms "perceived ease of use", "perceived usefulness" and "perceived risks" as central components to explain mobile app use in general (e.g. Kappor, Dwivedi, & Williams, 2014; Khalifa & Shen, 2008; Peng, Chen, & Wen, 2014; Schierz, Schilke, & Wirtz, 2010; Taylor & Levin, 2014; Yang, 2013; Yang, Lu, Gupta, & Cao, 2012). However, recent research begins to extend the model and to include more variables with respect to concrete application contexts of mobile apps—like brand marketing (Peng et al., 2014), mobile commerce (Khalifa & Shen, 2008) and mobile payment (Kappor et al., 2014; Schierz et al., 2010; Yang et al., 2012). Another reason for a shift to individual-related and context-specific influences is given because the original model only focussed on

work-related technological applications, where the work environment and context can be designed more easily. In tourism as a consumer oriented context this is not the case. In such application contexts individual-related and context-specific variables are of particular interest (Gainsbury, Wood, Russell, Hing, & Blaszczyński, 2012; Lai, 2014; Riquelme & Rios, 2010). Some of these variables, indeed, have already been investigated empirically in preliminary studies with respect to mobile app use in general. However, concerning mobile apps in tourism, also the specific context of the vacation-related application has to be considered. So the general tendency to use an information technology should not be equated with the specific tendency to use this information technology on vacation (MacKay & Vogt, 2012; Parra-López, Bulchand-Gidumal, Gutiérrez-Taño, & Díaz-Armas, 2011). In the following sections we therefore develop hypotheses with regard to five different characteristics of individuals we expect to influence the highly frequent usage of mobile apps on vacation:

## ***2.1 Tendency to Internet Use on Vacation***

In the scientific literature it is generally assumed that the basic tendency to use a new information technology is closely related to the extent of previous experiences with similar technologies or in similar contexts (Vatanparast & Qadim, 2009). In accordance to the technology acceptance model this is explained by general predispositions of a person regarding perceived usefulness, perceived ease of use as well as perceived risks. On the one hand, the application of a similar technology in a similar context can be seen as an indicator for generally better predispositions with respect to openness for innovation and the application of new technologies. On the other hand, prior experiences with the application of a similar technology in a similar context also positively influence the predispositions of perceived usefulness, perceived easiness of use as well as perceived risks. So in fact, it is easier for people to use a new technology (perceived ease of use), if they have previous experiences with similar technologies. Such users also tend to perceive a higher benefit (perceived usefulness) with the application of a similar new technology (Kim et al., 2008; Oh et al., 2009). Both effects fosters a higher intention to use a new technology in the context of previous experiences (Oh et al., 2009; Venkatesh & Davis, 2000). Correspondingly, we propose:

*H1* The general tendency for internet use on vacation is positively related to the frequent use of mobile apps on vacation.

## 2.2 *Employment Status*

Fundamental studies of information technology use in companies show, that the experience of workplace technology influences employees intention to apply new information technology (Ahuja & Thatcher, 2005). For instance, in respective studies already has been shown that full-time employed people generally tend to use the internet more intensively (Bimber, 2000; Conroy & Williams, 2014), are more receptive for web-based distance learning (Christensen, Anakwe, & Kessler, 2001) and have a higher propensity to use social networking sites (Conroy & Williams, 2014). More concrete in the context of mobile applications recent research shows that full-time employed people have a higher propensity to gamble mobile (Gainsbury et al., 2012), to use apps in sporting activities (Piwek, Joinson, & Morvan, 2015) and to use more different types of mobile apps in general (Lai, 2014). The identified effects can be justified by spillover effects from the technological environments at the workplaces (Ahuja & Thatcher, 2005). Today in most organizations continuous respectively frequent changes in information technology and its applications are normality and employees are somehow used to it (Fichman, Dos Santos, & Zheng, 2014). Former experiences with processes of adoption of new communication technologies in their professional live as well as experiences with new information technologies spill over in private contexts and enhance perceived usefulness and ease of use as well as reduce perceived risks. These spillover effects should also foster higher intentions to use new information technology in private contexts, more concretely: on vacation (Kim et al., 2008; Oh et al., 2009; Venkatesh & Davis, 2000). Summing up, we propose:

*H2* Tourists, who are currently employed, have a higher propensity to frequent use of mobile apps on vacation.

## 2.3 *Age*

Age has previously been observed as a relevant factor influencing the individual adoption of information technology of people (Holt, Shehata, Strömbäck, & Ljungberg, 2013). In general, young people are more likely to use online communication than older people (Lenhart, Purcell, Smith, & Zickuhr, 2010). Thereby, flexibility and task orientation of younger people appear to facilitate their technology adoption (Brown, Dennis, & Venkatesh, 2010). Younger people have grown up with new information technologies (like social media and mobile apps) and are used to frequent changes in these. They are used to these new kinds of communication (“digital natives”), whereas older people by trend are accustomed to other, conventional types of communication (Bennett & Maton, 2010; Helsper & Eynon, 2010). For older people, information technology adoption thus entails a fundamental change in their communication behavior. Young adults are considered to be the most active group of mobile app users (Chan-Olmsted, Rim, & Zerba, 2012).



Recent research also shows that younger people have a higher tendency to apply mobile apps for dating (Grosskopf, LeVasseur, & Glaser, 2014), tend to use more different types of mobile apps (Lai, 2014), have higher numbers in total app downloads, have a higher tendency to use rating apps and a higher willingness to pay for their application (Bidmon, Terlutter, & Röttl, 2014). In some contexts younger people tend to perceive higher usefulness of mobile apps (Vatanparast & Qadim, 2009). It has also been shown in recent research that age moderates the positive influences of intuitive ease of use, convenience of use as well as perceived usefulness on behavioral intentions to use a specific kind of mobile app (Teh, Ahmed, Cheong, & Yap, 2014). All these findings indicate advantages of younger people by using apps. Furthermore, some general disadvantages of older people have already been investigated empirically with respect to mobile app use: Older people less often possess a smart phone (Tse et al., 2014) and they also tend to have problems using smart phones as well as mobile apps (Kurniawan, 2008; Lee et al., 2014). Correspondingly, we propose:

*H3* Older tourists have a lower propensity to frequent use of mobile apps on vacation.

## **2.4 Gender**

General gender differences concerning adoption and usage behavior of new information technologies have been widely discussed and investigated empirically (Venkatesh & Morris, 2000; Venkatesh, Thong, & Xu, 2012; Whitley, 1997). Stereotypes of that research stream see men by trend adopting easier to new information technologies (Bimber, 2000). Correspondingly, women tend to adopt and domesticate new information technologies more slowly (Rickard & Lloyd, 2012). One psychological difference is that men tend to react stronger on positive influences concerning new information technologies, whereas women tend to stronger react on negative influences (Ahuja & Thatcher, 2005). Also, concerning mobile app use gender differences have already been investigated empirically in various contexts. Men are more likely to use mobile apps for news search and reading (Chan-Olmsted et al., 2012), tend to use more different types of mobile apps (Lai, 2014), download higher numbers of different apps (Bhave, Jain, & Roy, 2013), have a higher propensity to gamble mobile (Gainsbury et al., 2012), and are more likely to use rating apps (Bidmon et al., 2014).

Gender has been shown as a moderator to perceived ease of use as well as perceived usefulness of mobile banking apps (Riquelme & Rios, 2010). Therefore, we propose:

*H4* Male tourists have a higher propensity to frequent use of mobile apps on vacation.

## 2.5 *Tourist Origin*

Generally, empirical research shows that there exist significant differences regarding motivation and use of mobile apps between countries (Lim, Bentley, Kanakam, Ishikawa, & Honiden, 2015). Also regional and national patterns of app use have already been observed (Xu et al., 2011). Both findings indicate influences of people's origin on their tendency to use specific mobile apps on vacation. Though, on the basis of the reasons indicated it cannot be concluded how exactly a persons' tendency to use mobile apps is influenced by their origin. However, there is one exception in this respect: Thus, generally high costs and the lack of mobile service area are by far the most common reasons for non-use of mobile apps abroad (Kim et al., 2008). However, exactly these two attributes describe the situation of tourists in a foreign country: Either they have no or limited roaming of data services or they have a more expensive rate than at home (Barbera, Kosta, Mei, Perta, & Stefa, 2014; Chen, Taylor, Coxon, & Moore, 2012). Correspondingly, high roaming costs are still a relevant factor negatively influencing the use of mobile apps in foreign countries (Ravindranath, Agarwal, Padhye, & Riederer, 2014). This should especially apply for tourism and travel contexts (Boiano, Bowen, & Gaia, 2012). Correspondingly, we propose:

*H5* Foreign tourists have a lower propensity to frequent use of mobile apps on vacation.

## 3 Method and Data

Data collection has been conducted as convenience sample from July, 14th until August, 10th 2014 in eleven tourism destinations in the Canton of Grisons, Switzerland. The sample consists of 1562 participants spending their holiday in the Canton. Age, gender and origin were proportionally controlled for the sample with regard to the average guest structure of the last 10 years in the Canton of Grisons.

### 3.1 *Dependent Variable*

This study focusses on the research question what relevant indicators are to expect people to use mobile apps frequently on vacation. Tourists have been asked concerning eight different kinds of tourism related mobile applications (weather, traffic, geolocation, destination services, games, events, hiking, biking) whether they use it frequently in their vacation. In this analysis our depended variable is a dichotomous variable that measures whether a tourist uses at least one mobile app of the different types frequently. The dummy variable takes the value of one if at

least one kind of mobile apps is used frequently by the respondent and takes the value of zero otherwise.

### ***3.2 Independent Variable***

To measure the general tendency for internet use on vacation we asked the interviewees to give a rough estimate, how often they use the Internet on a holiday. Potential answers were ordinal scaled: (0) never, (1) rarely (2) 1 h (3) 2–3 h (4) 4–6 h (5) more than 6 h. With respect to employment status we asked the interviewees if they are employed or not. Analogously, we apply a dummy variable, which takes the value of one in cases where the interviewees are employed and takes the value of zero otherwise. Age of the respondents is included in the analysis metrically scaled. For the respondents' gender we apply a dummy variable, which takes the value of one in cases of male respondents and takes the value of zero in cases of female respondents. We apply a dummy variable also for interviewees' foreign origin, which takes the value of one in cases where respondents originate from abroad and takes the value of zero otherwise.

### ***3.3 Controls***

Following recent research we control for effects of education (Chan-Olmsted et al., 2012; Gainsbury et al., 2012; Grosskopf et al., 2014; Vatanparast & Qadim, 2009) as well as the home environment (Conroy & Williams, 2014; Gainsbury et al., 2012; Piwek et al., 2015) of the interviewees. Therefore we apply categorical variables for education as well as the population of the home residence.

### ***3.4 Analytical Approach***

We test our hypotheses by means of a regression analysis. Therefore, we mean-center and standardize the control variables as well as the independent variables to account for different measurement scales (Aiken & West, 1991). For the binary dependent variable "Frequent Use", we apply a binary logistic regression model. Computing our regression analysis, we first enter the control variables (Model 1) and then include our independent variables in a second step (Model 2).

**Table 1** Descriptive results

Variable	#	%	Variable	#	%
Education:			Tendency of Internet use on vacation:		
Compulsory school	117	7.5	0: Never	192	12.3
Vocational school	406	26.0	1: Rarely	430	27.5
School leaving examination	175	11.2	2: 1 h	614	39.7
Technical college	264	16.9	3: 2–3 h	263	16.8
University of Appl. Sciences	244	15.6	4: 4–6 h	31	2.0
University	337	21.6	5: more than 6 h	18	1.2
<i>unknown</i>	19	1.2	<i>unknown</i>	14	0.9
Population of Home Residence:			Employment Status:		
<5000	422	27.0	Employed	1073	68.7
5000–<10,000	236	15.1	Unemployed	468	30.0
10,000–<50,000	446	28.6	<i>unknown</i>	21	1.3
50,000–<100,000	133	8.6			
100,000 and more	296	19.0	Gender:		
unknown	29	1.9	Male	741	47.4
			Female	784	50.2
			<i>unknown</i>	37	2.4
Age:			Origin of Guest:		
20 and younger	77	4.9			
21–30	271	17.3	Domestic	1155	73.9
31–40	316	20.2	Foreign country	359	23.0
41–50	404	25.9	<i>unknown</i>	48	3.1
51–60	261	16.7			
61–71	139	8.9	Frequent use of mobile app on vacation:		
71 and older	87	5.6	yes	839	53.7
<i>unknown</i>	7	0.4	no	702	44.9
			<i>unknown</i>	21	1.3

## 4 Results and Discussion

Descriptive statistics are provided in Table 1. The results show quite homogeneous distributions of the sample on the categories about education and population of home residence. About 40 % of the respondents use the internet on holidays never or rarely; another 40 % use it 1 h a day on average. The remaining 20 % use it 2 h or more. Almost 70 % of the respondents are employed. The age distribution shows that almost 60 % of the tourists in the sample are 40 years old or older. The average age of the respondents is 44 years, minimum is 12, and maximum is 87. The sample is almost equally spitted between male and female respondents. 74 % of the tourists are national whereas 23 % come from abroad. The descriptive results also reveal that 54 % of the respondents use at least one tourism related mobile app in their holidays.

**Table 2** Results of binary logistic regression (Dep. variable: “frequent user”)

	Model 1	Model 2
Constant	0.152***	0.168***
Education: (Ref. “Compulsory School”)		
“Vocational School”	0.036	0.151
“School Leaving Examination”	0.011	-0.009
“Technical College”	0.092	0.114
“University of Applied Sciences”	0.251***	0.245***
“University”	0.085	0.091
Population of residence: (Ref: <5000)		
5000-<10,000	0.022	0.021
10,000-<50,000	0.102*	0.150**
50,000-<100,000	-0.086	-0.040
100,000 and more	-0.041	-0.037
General Propensity of Internet Use on Vacation (H1)		0.768***
Employment Status: Employed (H2)		0.118*
Age (H3)		-0.325***
Gender: Male (H4)		-0.025
Origin: Foreigner (H5)		-0.233***
Nagelkerke’s R <sup>2</sup>	0.022	0.229
Cox & Snell R <sup>2</sup>	0.016	0.171
Significance	0.002	0.000
N	1562	1542

Notes: \*0.1 > p ≥ 0.05; \*\*0.05 > p ≥ 0.01; \*\*\*p < 0.01

To check for multi-collinearity issues we applied a correlation matrix of all explanatory variables used in the binary logistic regression analysis. Some of the explanatory variables are correlated. However with -0.390 as the maximum correlation coefficient (between age and tendency for internet use on vacation) multi-collinearity issues are not indicated.

Table 2 shows the results of our regression analysis. The results reveal that our control variables influence in some way the frequent mobile app use on vacation. Therefore, tourists with a degree of a university of applied science or coming from a residence with a population between 10,000 and 50,000 inhabitants show a significant higher propensity for frequent mobile app use on vacation. Model 2 in comparison to Model 1 shows an increase of R<sup>2</sup> of 0.207 indicating substantial explanatory power of the independent variables of our regression model.

*Hypothesis 1* suggests that the general tendency for internet use on vacation is positively related to frequent use of mobile apps on vacation. Our regression results show a strong positive relation between the general tendency for internet use on vacation and frequent use of mobile apps on vacation (p < 0.01). Our hypothesis 1 is thus fully confirmed by the data. The strong and significant effect indicates that mobile apps are seen as just a kind of information technology at all by many

tourists. Therefore, an overall pattern of information technology use on vacation can be derived including mobile apps as one specific kind of it.

*Hypothesis 2* states that being employed is positively related to frequent use of mobile apps on vacation. Our regression results show a weak significant influence for employment on frequent use of mobile apps on vacation ( $p < 0.1$ ). Correspondingly, our hypothesis 2 is supported. People, who are employed, get somehow in touch with recent information technology by trend and this also increases their propensity to apply mobile apps—as one specific information technology—in their holidays. However, this pattern may raise a causality issue. One could reverse the interpretation of the pertinent results and say that people who do not like to try new technologies in their spare time, tend to have fewer chances of employment (Schleife, 2006).

*Hypothesis 3* suggests that age is negatively related to frequent use of mobile apps on vacation. Our regression results show a strong negative relation between the age and frequent use of mobile apps vacation ( $p < 0.01$ ). Our hypothesis 3 is thus fully confirmed by the data. Older people generally tend to be less open for applications of new technologies. Therefore, this result can be interpreted as further empirical evidence in detail for a well-established general pattern.

*Hypothesis 4* states that males have a higher propensity to frequent use of mobile apps on vacation. Our regression results show no significant influence for gender on frequent use of mobile apps on vacation. Correspondingly, our hypothesis 4 is not supported. Thus, general gender related patterns of mobile app use on vacation should be neglected. However, future research should investigate more detailed patterns between gender and the use of concrete types of mobile apps on vacation (e.g. traffic apps, mobile games or weather apps).

*Hypothesis 5* states that foreign guests have a lower propensity to frequent use of mobile apps on vacation. Our regression results show a strong negative relation between the originating from a foreign country and frequent use of mobile apps on vacation ( $p < 0.01$ ). Our hypothesis 5 is thus fully confirmed by the data. However, this pattern could possibly be limited in time as the underlying technology providers tend to increase availability and to decrease costs of mobile use in foreign countries.

## 5 Conclusions

This study extends the state of research by analyzing empirically the influence of five person-related factors influencing the use of mobile apps of people on vacation. Therefore, it follows recent developments in the field by applying concrete variables in relation to the theoretical terms of the technology adoption model. The results are of special value for practical application as they support an enhanced development and implementation of mobile app based services in the tourism industry. Mobile apps are currently a promising tool for organizations in the industry to enhance their service provision and to increase the quality of relationships and interactions with their customers. The results of this study can be applied

by service providers to develop and implement new mobile apps in tourism on the basis of information about their current customer segments. However, further research should differentiate between general influences of person-related factors on mobile app use versus type-specific influences. Therefore, future studies should analyze more detailed influences on the use of concrete kinds of mobile apps in tourism.

## References

- Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication. *MIS Quarterly*, *16*(2), 227–247.
- Ahuja, M. K., & Thatcher, J. B. (2005). Moving beyond intentions and toward the theory of trying: Effects of work environment and gender on post-adoption information technology use. *MIS Quarterly*, *29*(3), 427–459.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. London: Sage.
- Anacleto, R., Figueiredo, L., Almeida, A., & Novais, P. (2014). Mobile application to provide personalized sightseeing tours. *Journal of Network and Computer Applications*, *41*, 56–64.
- Barbera, M., Kosta, S., Mei, A., Perta, V., & Stefa, J. (2014). *Mobile offloading in the wild: Findings and lessons learned through a real-life experiment with a New Cloud-Aware System*. Proceedings of the 33rd IEEE Conference on Computer Communications (INFOCOM), Toronto, (pp. 2355–2363).
- Bennett, S. J., & Maton, K. (2010). Beyond the ‘Digital Natives’ Debate: Towards a more nuanced understanding of students’ technology experiences. *Journal of Computer Assisted Learning*, *26* (5), 321–331.
- Bhave, K., Jain, V., & Roy, S. (2013). Understanding the orientation of Gen Y toward mobile applications and In-App advertising in India. *International Journal of Mobile Marketing*, *8*(1), 62–74.
- Bidmon, S., Terlutter, R., & Röttl, J. (2014). What explains usage of mobile physician-rating apps? Results from a web based questionnaire. *Journal of Medial Internet Research*, *16*(6), e.148.
- Bimber, B. (2000). Measuring the gender gap on the Internet. *Social Science Quarterly*, *81*(3), 868–876.
- Boiano, S., Bowen, J. P., & Gaia, G. (2012). Usability, design and content issues of mobile apps for cultural heritage promotion: The Malta culture guide experience. *arXiv preprint arXiv:1207.3422*.
- Brown, S. A., Dennis, A. R., & Venkatesh, V. (2010). Predicting collaboration technology use: Integrating technology adoption and collaboration research. *Journal of Management Information Systems*, *27*(2), 9–53.
- Chan-Olmsted, S., Rim, H., & Zerba, A. (2012). Mobile news adoption among young adults: Examining the roles of perception, news consumption, and media usage. *Journalism and Mass Communication Quarterly*, *90*(1), 126–147.
- Chen, Y., Taylor, W., Coxon, S., & Moore, J.H. (2012). isnac: Infrastructureless social networking at academic conferences. Demo at the 31st IEEE Conference on Computer Communications (INFOCOM), Orlando.
- Christensen, E. W., Anakwe, U. P., & Kessler, E. H. (2001). Receptivity to distance learning: The effect of technology, reputation, constraints, and learning preferences. *Journal of Research on Computing in Education*, *33*(3), 263–279.

- Conroy, S., & Williams, A. (2014). *Use of Internet, social networking sites, and mobile technology for volunteerism*, AARP Report, April 2014.
- Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–40.
- Dickinson, J. E., Ghali, K., Cherrett, T., Speed, C., Davies, N., & Norgate, S. (2014). Tourism and the Smartphone app: Capabilities, emerging practice and scope in the travel domain. *Current Issues in Tourism*, 17(1), 84–101.
- Featherman, M. S., & Pavlou, P. A. (2003). Predicting E-services adoption: A perceived risk facets perspective. *International Journal of Human-Computer Studies*, 59(4), 451–474.
- Fichman, R. G., Dos Santos, B. L., & Zheng, Z. (2014). Digital innovation as a fundamental and powerful concept in the information systems curriculum. *MIS Quarterly*, 38(2), 329–353.
- Fu, R., Farn, C., & Chao, W. (2006). Acceptance of electronic tax filing: A study of taxpayer intentions. *Information and Management*, 43(1), 109–126.
- Gainsbury, S., Wood, R., Russell, A., Hing, N., & Blaszczynski, A. (2012). A digital revolution: Comparison of demographic profiles, attitudes and gambling behavior of Internet and non-Internet gamblers. *Computers in Human Behavior*, 28(4), 1388–1398.
- Grosskopf, N. A., LeVasseur, M. T., & Glaser, D. B. (2014). Use of the Internet and mobile-based “Apps” for sex-seeking among men who have sex with men in New York City. *American Journal of Men’s Health*, 8(6), 510–520.
- Helsper, E. J., & Eynon, R. (2010). Digital natives: Where is the evidence? *British Educational Research Journal*, 36(3), 503–520.
- Holt, K., Shehata, A., Strömbäck, J., & Ljungberg, E. (2013). Age and the effects of news media attention and social media use on political interest and participation: Do social media function as leveller? *European Journal of Communication*, 28(1), 19–34.
- Kappor, K. K., Dwivedi, Y. K., & Williams, M. D. (2014). Conceptualising the role of innovation: Attributes for examining consumer adoption of mobile innovations. *Marketing Review*, 14(4), 407–430.
- Khalifa, M., & Shen, K. N. (2008). Explaining the adoption of transactional B2C mobile commerce. *Journal of Enterprise Information Management*, 21(2), 110–124.
- Kim, D.-Y., Park, J., & Morrison, A. M. (2008). A model of traveller acceptance of mobile technology. *International Journal of Tourism Research*, 10(5), 393–407.
- Kurniawan, S. (2008). Older people and mobile phones: A multi-method investigation. *International Journal of Human-Computer Studies*, 66(2), 889–901.
- Lai, C.-H. (2014). An integrated approach to untangling mediated connectedness with online and mobile media. *Computers in Human Behavior*, 31, 20–26.
- Law, R., Buhalis, D., & Cobangoglu, C. (2014). Progress on information and communication technologies in hospitality and tourism. *International Journal of Contemporary Hospitality Management*, 26(5), 727–750.
- Lee, J.-A., Nguyen, A. L., Berg, J., Amin, A., Bachman, M., Guo, Y., et al. (2014). Attitudes and preferences on the use of mobile health technology and health games for self-management: Interviews with older adults on anticoagulation therapy. *Journal of Medial Internet Research*, 2(3), e32.
- Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social media and mobile Internet use among teens and young adults. Washington, DC: Pew Research Center, <http://files.eric.ed.gov/fulltext/ED525056.pdf> (accessed August 18, 2015).
- Lim, S. L., Bentley, P. J., Kanakam, N., Ishikawa, F., & Honiden, S. (2015). Investigating country differences in mobile app user behavior and challenges for software engineering. *IEEE Transactions on Software Engineering*, 41(1), 40–64.
- MacKay, K., & Vogt, C. (2012). Information technology in everyday and vacation context. *Annals of Tourism Research*, 39(3), 1380–1401.
- Minazzi, R., & Mauri, A. G. (2015). Mobile technologies effects on travel behaviours and experiences: A preliminary analysis. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism*. Switzerland: Springer International Publishing.



- Nickerson, R. C., Austreich, M., & Eng, J. (2014). Mobile technology and Smartphone apps: A diffusion of innovation analysis. *Proceedings of the Twentieth Americas Conference on Information Systems* (pp. 1–12), Savannah.
- Oh, S., Lehto, X. Y., & Park, J. (2009). Travelers' intent to use mobile technologies as a function of effort and performance expectancy. *Journal of Hospitality Marketing and Management*, 18(8), 761–781.
- Parra-López, E., Bulchand-Gidumal, J., Gutiérrez-Taño, D., & Díaz-Armas, R. (2011). Intentions to use social media in organizing and taking vacation trips. *Computers in Human Behavior*, 27(2), 640–654.
- Pavlou, P. (2001). *Integrating trust in electronic commerce with the technology acceptance model: Model development and validation*. Proceedings of the 7th Americas Conference on Information Systems (AMCIS): 816–822.
- Peng, K.-F., Chen, Y., & Wen, K.-W. (2014). Brand relationship, consumption values and branded app adoption. *Industrial Management and Data Systems*, 114(8), 1131–1143.
- Piwek, L., Joinson, A., & Morvan, J. (2015). The use of self-monitoring solutions amongst cyclists: An online survey and empirical study. *Transport Research Part A*, 77, 126–136.
- Ravindranath, L., Agarwal, S., Padhye, J., & Riederer, C. (2014). *Procrastinator: Pacing mobile apps' usage of the network*. Proceedings of the 12th ACM Annual International Conference on Mobile Systems, Applications, and Services, Bretton Woods (pp. 232–244).
- Rickard, S., & Lloyd, C. (2012). Consuming apps: The Australian woman's slow appetite for apps. *Telecommunications Journal of Australia*, 62(4), 1–15.
- Riquelme, H. E., & Rios, R. S. (2010). The moderating effect of gender in the adoption of mobile banking. *International Journal of Bank Marketing*, 28(5), 328–341.
- Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications*, 9(3), 209–216.
- Schleife, K. (2006). Computer use and employment status of older workers. An analysis based on individual data. *Labour*, 20(2), 325–348.
- Taylor, D. G., & Levin, M. (2014). Predicting mobile app usage for purchasing and information-sharing. *International Journal of Retail and Distribution Management*, 42(8), 759–774.
- Teh, P.-L., Ahmed, P. K., Cheong, S.-N., & Yap, W.-J. (2014). Age-group differences in near field communication Smartphone. *Industrial Management and Data Systems*, 114(3), 484–502.
- Tse, M. M. Y., Chan, K. L., Wong, A. S. W., Tam, E. W. C., Fan, E. Y. L., & Yip, G. P. C. (2014). The use of smart phones and their mobile applications among older adults in Hong Kong: An exploratory study. *Journal of Nursing and Health Care*, 1(2), 118–122.
- Vatanparast, R., & Qadim, H. Z. (2009). A cross-cultural study on mobile Internet usage. *International Journal of Mobile Marketing*, 4(2), 14–27.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.
- Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 42(1), 115–139.
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157–178.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of Smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387.
- Whitley, B. E., Jr. (1997). Gender differences in computer-related attitudes and behavior: A meta-analysis. *Computers in Human Behavior*, 13(1), 1–22.
- Xu, Q., Erman, J., Gerber, A., Mao, Z.M., Pang, J., & Venkataraman, S. (2011). Identifying Diverse Usage Behaviors of Smartphone Apps. *Proceedings of the Internet Measurement Conference*, (pp. 329–341). Berlin: ACM.

- Yang, H. (2013). Bon Appétit for apps: Young American consumers' acceptance of mobile applications. *Journal of Computer Information Systems*, 53(3), 85–96.
- Yang, S., Lu, Y., Gupta, S., & Cao, Y. (2012). Does context matter? The impact of use context on mobile Internet adoption. *International Journal of Human-Computer Interaction*, 28(8), 530–541.

**Part V**  
**Semantic Technology and Recommender**  
**Systems**

# Correlating Languages and Sentiment Analysis on the Basis of Text-based Reviews

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**Abstract** Customer experiences, in the shape of online reviews, influence other customers and in general, contribute to build a perception of a destination. This work presents the conclusions of a survey to gather user text-based reviews about several categories of destination-related information (accommodation, restaurants, attractions and Points of Interest) from three well-known social media sources (Facebook, FourSquare and GooglePlaces) about eight worldwide destinations with a high overnight rate. Several hypotheses about the correlation between the language and sentiment features of the reviews have been validated over a large dataset of reviews. For example, the analysis detected that the highest number of reviews in a destination is written in the same official language spoken in that place. Furthermore, Dutch speaking people are more positive when writing a review. Finally, English, Italian and Spanish speakers seem to prefer FourSquare while German and French people are quite evenly distributed among FourSquare and GooglePlaces.

**Keywords** Social media • Tourist reviews • Destinations • Sentiment analysis

## 1 Introduction

Social media are “Internet-based applications that build on the ideological and technological foundations of the Web 2.0 and that allow the creation and exchange of user-generated content” (Kaplan & Haenlen, 2010, p. 61). Social media and user-generated content are completely reshaping the way tourism-related information is distributed and the way people make plans to travel. They continue growing and impacting the tourism and hospitality industry (Xiang & Gretzel, 2010).

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The huge growth of these sources has forced the emergence of new research approaches in a wide range of disciplines (Schuckert, Liu, & Law, 2015), as the content generated must be systematically gathered, analysed and aggregated in order to leverage it (Hvass & Munar, 2012). Recent examples have demonstrated that the analysis of the text-based reviews and comments from customers can unveil interesting patterns, information and behaviours. Social media interactions generate valuable information that, if properly handled, enables new business strategies like targeted marketing campaigns or customised services (Ng & Lien, 2014). While some of them may include curiosities, others may be used to improve the global vision of the market and to perform a better profiling of the customers.

When talking about text-based reviews, it is often necessary to use some automatic approach to obtain the desired information from the text. Currently, there are many free and Open Source tools to analyse text and provide different degrees of automatic natural language understanding. This work presents the conclusions of a survey to gather user text-based reviews about several categories of destination-related information (accommodation, restaurants, attractions and Points of Interest) from three well-known social media sources (Facebook,<sup>1</sup> Four-Square<sup>2</sup> and GooglePlaces<sup>3</sup>). Natural Language Processing tools have been used to perform a basic sentiment polarity analysis, assigning a polarity value from 0 to 10 to all the reviews. The analysis has been based on several hypotheses about the relationship among several variables (destinations, languages, polarities) extracted from the reviews.

Some of the most relevant results of our analysis consist of the discovery of a correlation between the language of a review and the destination the review is about. The highest number of reviews about a touristic location is written in the same language spoken in that location. Secondly, Dutch people leave the most positive reviews. Finally, Foursquare seems the most used social network for tourism, especially for people speaking English.

The rest of this paper is structured as follows. Section 2 describes the research background related to social media and electronic Word-of-Mount as well as text mining and sentiment analysis in the tourism sector. Section 3 defines the methodology employed to gather and analyse the data from the chosen social networks, as well as the research hypothesis. Section 4 analyses some of the results obtained during the validation campaign, and proposes some discussion about it. Finally, Section 5 proposes several conclusions and future work.

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<sup>1</sup> [www.facebook.com](http://www.facebook.com).

<sup>2</sup> [www.foursquare.com](http://www.foursquare.com).

<sup>3</sup> [plus.google.com/u/0/local](http://plus.google.com/u/0/local).

## 2 Research Background

### 2.1 Social Media And Electronic Word-of-Mouth

To reduce uncertainty and perceived risks, consumers often search for Word-of-Mouth (WOM) when making purchase decisions. Much previous research has presented extensive evidence showing the importance of WOM in purchase decision and choice behaviour. In the Internet era, the effect of WOM has been further enhanced in the form of electronic Word of Mouth (eWOM) (Hudson, Roth, Madden, & Hudson, 2015; Litvin, Goldsmith, & Pan, 2008). Advances in Information and Communication Technologies (ICT) have brought unprecedented opportunities and challenges to information-intensive industries (Munar, Gyimóthy, & Cai, 2013). Consumers can make their opinions easily accessible to other Internet users via message boards, Twitter, product review Websites or online communities.

The impact of eWOM is particularly important when it refers to experience goods, as the quality of those goods, such as accommodation or food&beverage services, is often unknown before consumption. Thus, consumers have to rely on eWOM to make inferences about the quality of such goods (Wirtz & Chew, 2002). Given the critical influence of eWOM on the hospitality industry, especially the hotel segment (Cantallops & Salvi, 2014), online text-based reviews have become a key component of hospitality management (Leung, Law, Van Hoof, & Buhalis, 2013). Hoteliers are increasingly aware of the need to develop strategies to address consumer reviews (Levy, Duan, & Boo, 2013).

Consumers write online reviews to indicate their level of satisfaction with the hotel (Liu, Law, Rong, Li, & Hall, 2013) and inform other consumers on the Internet about their hotel stay experience (Park & Allen, 2013). Online text-based reviews have become one of the most important information sources in consumers' lodging decision making (Ye, Law, Gu, & Chen, 2011) and are used considerably to inform consumers of accommodation quality (Filiari & McLeay, 2014). Consumers tend not to book a hotel without seeking online reviews (Kim, Mattila, & Baloglu, 2011).

A number of Websites specialized in tourism and hospitality has flourished on the Web (e.g., Trip-advisor, Hotels.com, Expedia, Yelp.com, Citysearch, Orbitz, Booking.com) and several social networks. Many of them enable users to exchange information, opinions or recommendations concerning certain destinations, hotels, and other tourist services (Liu & Park, 2015; O'Connor, 2008; Ye et al., 2011). These online platforms provide excellent tools for tourists to document and relive their travel experience such as expressing their satisfaction level with the hotel stay experience (Filiari & McLeay, 2014). Besides of the overall ratings, attribute ratings on hotel specific attributes such as service, location, price room and cleanliness are available to customers on social media platforms, and are commonly taken into account when customers evaluate a hotel (Ramanathan & Ramanathan, 2011; Zhang, Zhang, Wang, Law, & Li, 2013).

## 2.2 *Text Mining and Sentiment Analysis*

The tremendous growth of these data-generating sources has inspired the development of new approaches to understand these phenomena in a variety of disciplines. Sentiment Analysis and Opinion Mining are closely related fields which refer to the application of Natural Language Processing (NLP) techniques to extract subjective information about how a person expresses a sentiment (negative, positive or neutral) about something (Liu, 2010; Liu, 2012; Pang & Lee, 2008). These tasks are increasingly important to determine the opinion about products and services, and brand reputation on the Internet (Cambria, Schuller, Xia, & Havasi, 2013; Gräbner, Zanker, Fliedl, & Fuchs, 2012; He, Zha, & Li, 2013).

During the last years, many different approaches have appeared in the literature to mine information from customer-generated textual comments. Ghose, Ipeirotis and Li (2009) used a 4-grams Dynamic Language Model classifier to acquire a subjectivity confidence score for each sentence in a hotel review, and derived the mean and standard deviation of this score. The analysis of the content focused on polarity classification, sentiment classification of customer reviews, or the automated extraction of product attributes. Ye, Zhang and Law (2009) presented a study to analyse the existing approaches to perform automatic classifications based on the sentiment analysis of online reviews related to travel destinations. Furthermore, the study analyses different supervised machine learning algorithms and their effect on the different amount of training corpus to various performance measurements in terms of accuracy, precision, and recall in the sentiment classification of online reviews about tourist destinations.

Moreover, Lee, Singh and Chan (2011) used text mining techniques to extract keywords from descriptive comments of hotel customers in order to identify areas of service failures and recovery actions, and identify main topics based on the frequency of key terms. Finally, Kasper and Vela (2011) have implemented a service for hotel managers that collects customer reviews from various sites on the Web; analyzes and classifies the textual content of the review; and presents the results in a precise way.

The current research trend is focusing on micro-blogging messages, which include dealing with short texts with a very particular format and jargon (Martínez-Cámara, Martín-Valdivia, Urena-López, & Montejó-Ráez, 2014), and using the so-called topic models to detect the topics and sentiment expressed in customer reviews (Rossetti, Stella, Cao, & Zanker, 2015).

## 3 Methodology

This study focuses on customer text-based reviews about several types of destination-related information in eight different cities and regions worldwide (Amsterdam, Barcelona, Berlin, Dubai, London, Paris, Rome and the Tuscany

region in Italy). Most of them are capital cities of relevant countries of Europe and all of them are destinations with high overnights rates. The case of Rome and Tuscany, both from Italy, has been selected to observe if there are similar patterns in the same country.

### **3.1 Research Hypothesis**

The Natural Language Processing and sentiment analysis tools have been used to validate the following hypothesis.

**H1:** There is a correlation between the language used to write the reviews and the official language at the destination

This hypothesis will investigate if a destination receives more reviews from people of the same country or from abroad (i.e. national tourism vs. international tourism). This fact can be inferred from the language of the reviews. It is assumed that the official language of the destination is the mother language of the tourists.

**H2:** The sentiment towards destination-related information depends on the nationality of the tourist

Several assumptions have been made to answer this question using the gathered data. The perception with the detected polarity for the analysed customer reviews is detected. Furthermore, it is assumed that the nationality of the reviewer is the same as the language used for the review. For example, we are assuming that a review in French belongs to a French tourist, which could be a very rough generalisation.

**H3:** Different languages are evenly distributed across studied social networks

The answer to this question will analyse if the three monitored social networks have an evenly distributed penetration with regard to the languages/countries. This hypothesis also assumes that there is a high correlation between languages and countries.

### **3.2 Data Collection**

As mentioned previously, the data used in this study has been retrieved from three popular social networks: Facebook, Foursquare and Google Places. Facebook is a general social network where registered users can build their own profile, establish relations with other users, create new content or pages about a topic (recipes, health, activities etc.) and review or express likes about users and their pages. Destinations can create their Webpage (a virtual wall) and publish multimedia content in order to



retrieve feedback. In the case of FourSquare and GooglePlaces, they are more location-based social networks, allowing users to interact and comment about places they have visited (including any type of accommodation). Registered users in FourSquare can perform one or more check-ins in a place according to the places visited which may lead into a large availability of places. Furthermore, hoteliers can register and advertise their properties in Google Places, receiving reviews and feedback from customers.

For each social network, a tailored crawler was used to extract reviews about four types of categories or places within the destination-related information in the previously mentioned eight cities: accommodation, restaurants, Points of Interest (POI) and attractions. For this survey, accommodation refers to a place where people can sleep; a restaurant is a place where people can eat and drink; POI is a local service for tourists, such as an ATM or a library; and an attraction is a place which attracts tourists to a given location, such as a monument or a museum.

This process was done in two steps. First, each crawler searches for places within the geographical areas of the analysed destinations. A geographical area has been identified by a circle defined by a geographical coordinate (i.e. latitude and longitude), which represents its centre, and a radius. Secondly, reviews about the four types of places were retrieved using algorithms tailored for each social network.

The data gathering process extracted 553.347 places and 634.564 text-based reviews in total. Table 1 illustrates the number of extracted places and reviews for each destination, divided per social network. Due to some crawling problems, places in Tuscany were not extracted for Facebook.

Table 2 shows some examples of text-based customer reviews gathered from the monitored social networks. Although all the examples are in English for better understanding of the paper, reviews in French, Italian, Spanish, German and Dutch have also been collected. The sample included both positive and negative reviews, some of them being more verbose while others are shorter and more direct.

The data gathering campaign was able to retrieve customer reviews ranging from December 2009 to May 2014. Table 3 illustrates the gathering periods for each social network (i.e. the earliest and the latest retrieved customer review).

**Table 1** Tourpedia data content summary

Location	Facebook		Foursquare		Google places	
	Places	Reviews	Places	Reviews	Places	Reviews
Amsterdam	583	7.725	7.735	27.537	13.635	7.623
Barcelona	455	3.732	6339	46.445	18.499	14.092
Berlin	2.084	3.078	21.875	43.816	39.765	22.630
Dubai	1.052	3.124	14.469	38.347	7.301	3.844
London	4.893	3.263	47.148	137.749	121.723	75.973
Paris	832	4.227	6.545	46.431	51.665	36.572
Rome	4.465	384	16.913	35.503	31.455	15.094
Tuscany	n.a.	n.a.	43.844	40.389	70.072	16.986

**Table 2** Some examples of gathered customer reviews (the original content is respected, including misspellings and typos)

Source	Examples of customer reviews (misspellings included)
Facebook	<i>One of my favorite hotels! very kind staff and great location!!! In the evening, a warm fireplace in the lobby and a wonderful mood!</i>
	<i>Bar open until you decide to go to bed and largest towels ever !!!</i>
	<i>10 euros per day for wifi!... Not acceptable in Europe !</i>
Foursquare	<i>Perfect location.</i>
	<i>Nice hosting service. Decent breakfast and honest staff, excepts some night shift receptionists...</i>
	<i>Worst hostel ever! I could stay in better rooms with this money. Rooms are cold, there are bugs everywhere, sheets are not clean.</i>
Google Places	<i>VERY POOR - Back-packers hostel, not a hotel. over 200 euros for the "family room" - very noisy, dirty very dusty, stains on the carpet.</i>
	<i>Very noisy rooms. Cleaning staff continuously enter in the room despite of "do not disturb" cartel. Reception staff not so helpful.</i>
	<i>Awesome hotel. Nice views (get an upper room) and it has all the top shelf frills you'd expect from a hotel like this.</i>

**Table 3** Date ranges of the gathered content

Social media	Start date	End date
Facebook	Thu Dec 13 2012 09:44:29 GMT +0100 (CET)	Sat Feb 01 2014 21:07:46 GMT +0100 (CET)
Foursquare	Wed May 27 2009 11:10:11 GMT +0200 (CEST)	Wed Nov 13 2013 00:26:58 GMT +0100 (CET)
Google Places	Mon Dec 31 2009 01:00:00 GMT +0100 (CET)	Sun May 11 2014 22:52:21 GMT +0200 (CEST)

### 3.3 Data Analysis

The customer review analysis process includes two main tasks: the identification of the language of the review and the analysis of its sentiment. OpeNER<sup>4</sup> tools have been used to fulfil this analysis. OpeNER is a Natural Language Processing framework that allows performing several types of text processing tasks in multiple languages (Agerri Gascón, Cuadros Oller, Gaines, & Rigau Claramunt, 2013; Garcia-Pablos, Cuadros, & Linaza, 2015).

The aggregated polarity for a place has been calculated in the following way. Let  $M = (m_1, m_2, \dots, m_k)$  be a set of social media networks, let  $j$  be a place available on all elements of the set  $M$  and let be  $R_{ij}^{(m)} = (r_{1j}^{(m)}, r_{2j}^{(m)}, \dots, r_{nj}^{(m)})$  the set of reviews associated to the place  $j$  on social media network  $m$ . Let  $o_{ji}$  be the sentiment polarity extracted through the polarity-tagger module from the review  $r_{ji}^{(m)}$ . The

<sup>4</sup> [www.opener-project.eu](http://www.opener-project.eu).

overall sentiment  $s_j^{(m)}$  about the place  $j$  on social media  $m$  is calculated as the arithmetic mean of all opinions  $o_{ij}$  :

$$s_j^{(m)} = \sum_{i=1}^n \frac{O_{ij}}{n}$$

The overall sentiment  $s_j$  about the place  $j$  is calculated as a weighted arithmetic mean of all  $s_j^{(m)}$ .

$$s_j = \sum_{i=1}^k \frac{w_i s_j^{(i)}}{k}$$

where  $\sum w_k = 1$ . The sentiment  $s_j$  is then normalized on a range 1-10, where 1 indicates the lowest value and 10 the highest one.

### 4 Research Hypotheses and Discussion

The data gathered and processed has been analysed in order to validate the research hypotheses. The first one focuses on the correlation among the languages used to write the reviews and the official language at the destination. Figure 1 shows the distribution of reviews gathered for each of the targeted locations.

As it was foreseen, English has a strong presence in all destinations, probably due to its use as *lingua franca* (Truchot, 2002). Apart from the pervasive presence of reviews in English, it can be clearly observed that the official language (the major language for the destination) dominates over the rest, except in the case of Amsterdam, in which there are more reviews in English than in Dutch. According to several reports, about 94 % of Dutch people can maintain a fluid conversation in

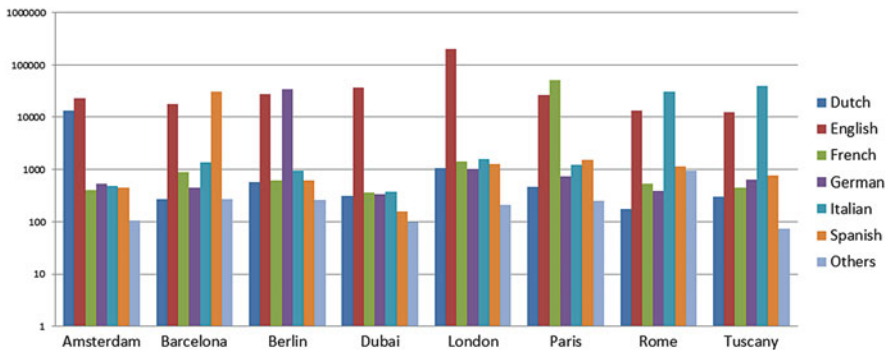


Fig. 1 Distribution of the language of the reviews per destination (logarithmic scale)

English,<sup>5</sup> a much higher percentage than people from other countries. This fact could explain the domination of English above Dutch in the reviews about Amsterdam.

In the case of Dubai, as Arabic has not been taken into account, English was expected to be the dominant language, as it is used for business, and around 75 % of the population in Dubai are expatriates, most of whom speak English apart from their mother language.<sup>6</sup>

It is worth observing that both Rome and Tuscany share very similar distribution of languages, something that is not a surprise since both are placed in Italy. However, Rome seems to have more other languages marked as “others”, probably due to its capital role, its historic relevance or being the placement for the Vatican.

Figure 2 shows the complementary distribution, destination reviews (from the all four categories of the destination-related information) across each of the analysed languages. As it was expected, English is more evenly distributed among all the destinations.

The relationship between the sentiment towards places and the nationality of the tourist was also analysed. Figure 3 displays the distribution of the detected polarity for each language. Unfortunately, it was not possible to detect sentiment for German due to a problem with the analysis tool. As it can be observed, there is a noticeable amount of Dutch reviews in the most positive side of the chart. Dutch people are known to be especially tolerant and open minded (Zick, Küpper, & Hövermann, 2011), a fact that may affect the severity with which they evaluate place when they are traveling.

On the other hand, the languages with more neutral reviews<sup>7</sup> are French, Italian and Spanish. Three of them are Romance languages (Italian, Spanish and French) in

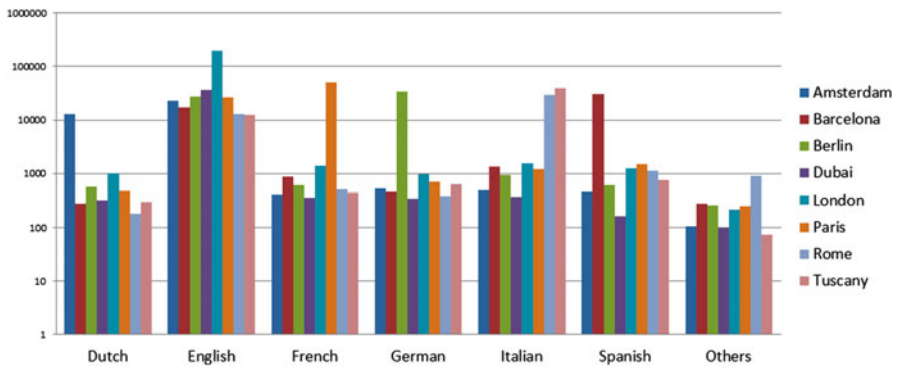
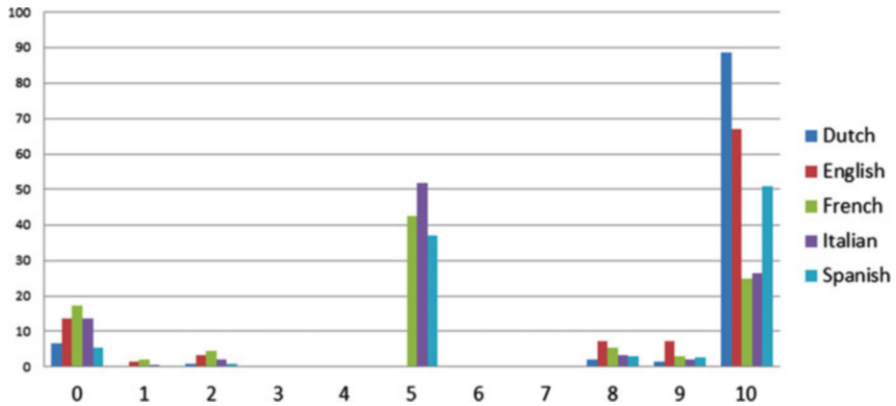


Fig. 2 Distribution of the destination reviews per language (logarithmic scale)

<sup>5</sup> Special Eurobarometer 386: Europeans and their languages, June 2012 [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_386\\_en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_386_en.pdf) Europeans and languages: [http://ec.europa.eu/public\\_opinion/archives/ebs/ebs\\_237.en.pdf](http://ec.europa.eu/public_opinion/archives/ebs/ebs_237.en.pdf).

<sup>6</sup> <https://www.justlanded.com/english/Dubai/Dubai-Guide/Language/Languages>.

<sup>7</sup> Always assuming the polarity given by our system and our metric.



**Fig. 3** Distribution of the language (percentage) of the reviews per detected polarity (polarity 0 means “very negative”, polarity 10 means “very positive”)

opposition to the other three non-Romance languages (English, German and Dutch). This may indicate a bias on how the language families (or the cultures behind those language families) explain their experiences when visiting a place or reviewing an accommodation. Germanic languages are historically known to use a more direct communication, while Romance languages usually use smoother expressions and euphemisms or more elaborated discourses to point out the same facts.<sup>8</sup> In any case, the bias on the sentiment distribution for the different languages may resemble the different ways of expressing emotions for different cultures.<sup>9</sup>

Furthermore, it can be observed that there are more reviews labelled as positives than negatives. This could be the actual tendency, although it is also known that negative opinions are more difficult to detect because of irony, sarcasm and other subtle ways to express dissatisfaction (Pang & Lee, 2008).

Finally, the distribution of the different languages across studied social networks was analysed (Fig. 4). It can be observed that FourSquare is very popular among English, Italian and Spanish speaking people. German and French people are quite evenly distributed among FourSquare and GooglePlaces. Facebook contains less content in general, probably because the interaction model is different and the content of the publication walls is more oriented to sharing multimedia content and special offers rather than to building a customer review ecosystem.

Also the distribution of other languages apart from the ones selected for this study can be observed. For a more detailed analysis, it would be interesting to include more languages to be detected and aggregated, to find out whether these languages are Asian (Chinese, Japanese), Russian, Arabic, or local languages.

<sup>8</sup> <http://www.cryptograph.com/englang.htm>.

<sup>9</sup> <http://news.stanford.edu/news/2015/march/cultural-differences-sympathy-032525.html>.

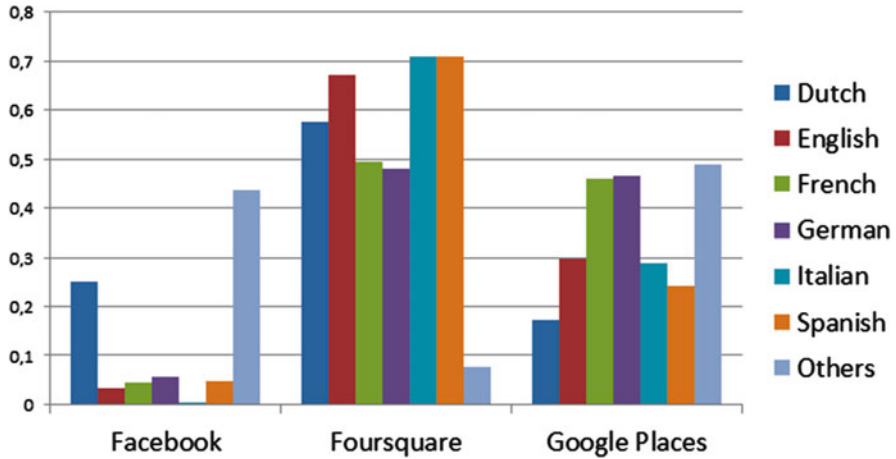


Fig. 4 Distribution of the language of the reviews per social network

## 5 Conclusions and Future Work

Social media and customer generated comments are become increasingly important to obtain relevant information about customers. This also applies to the several agents within the tourism value chain (destinations, accommodation, food&beverage), in which the customer generated opinions impact the perception of those agents and their associated products and services.

This paper deals an evaluation campaign in order to analyse with the correlation of the language and the sentiment analysis of multilingual text-based reviews from social media content. Three different social networks frequently used by destinations and tourists have been crawled in order to extract text-based reviews for eight relevant worldwide destinations. The language of the reviews has been automatically detected before performing a deep sentiment analysis to classify them into a sentiment scale.

Several research hypotheses have been defined and validated in order to motivate a discussion about the patterns detected and the generalization of the results to other destinations and languages. For example, the analysis detected that the highest number of reviews in a destination is written in the same official language spoken in that place. Furthermore, Dutch speaking people are more positive when writing a review. Finally, regarding the preference choices about the social media networks, English, Italian and Spanish speakers seem to prefer FourSquare while German and French people are quite evenly distributed among FourSquare and GooglePlaces.

Customer reviews can be further analysed to unveil more specific information, like the topics that are more frequently addressed, or to study the attributes of the categories that concern to different kind of tourists based on their language, behaviour and opinions.

## References

- Agerri Gascón, R., Cuadros Oller, M., Gaines, S., & Rigau Claramunt, G. (2013). Opener: Open polarity enhanced named entity recognition. *Procesamiento del Lenguaje Natural, Revista n° 51* (pp. 215–218)
- Cambria, E., Schuller, B., Xia, Y., & Havasi, C. (2013). New avenues in opinion mining and sentiment analysis. *IEEE Intelligent Systems*, 2, 15–21.
- Cantalops, A. S., & Salvi, F. (2014). New consumer behavior: A review of research one WOM and hotels. *International Journal of Hospitality Management*, 36, 41–51.
- Filieri, R., & McLeay, F. (2014). E-WOM and accommodation: An analysis of the factors that influence travelers' adoption of information from online reviews. *Journal of Travel Research*, 53(1), 44–57.
- García-Pablos, A., Cuadros, M., & Linaza, M. T. (2015, January). OpeNER: Open tools to perform natural language processing on accommodation. In *Information and Communication Technologies in Tourism 2015: Proceedings of the International Conference in Lugano, Switzerland* (p. 125). New York: Springer.
- Ghose, A., Ipeirotis, P., & Li, B. (2009, September). The economic impact of user-generated content on the Internet: Combining text mining with demand estimation in the hotel industry. In *Proceedings of the 20th workshop on information systems and economics (WISE)*.
- Gräbner, D., Zanker, M., Flieidl, G., & Fuchs, M. (2012). Classification of customer reviews based on sentiment analysis. *Conference on Information and Communication Technology in Tourism*. New York: Springer.
- He, W., Zha, S., & Li, L. (2013). Social media competitive analysis and text mining: A case study in the pizza industry. *International Journal of Information Management*, 33(3), 464–472.
- Hudson, S., Roth, M. S., Madden, T. J., & Hudson, R. (2015). The effects of social media on emotions, brand relationship quality, and word of mouth: An empirical study of music festival attendees. *Tourism Management*, 47, 68–76.
- Hvass, K. A., & Munar, A. M. (2012). The takeoff of social media in tourism. *Journal of Vacation Marketing*, 18(2), 93–103.
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 53(1), 59–68.
- Kasper, W., & Vela, M. (2011). Sentiment analysis for hotel reviews. In *Computational Linguistics-Applications Conference* (pp. 45–52).
- Kim, E. E. K., Mattila, A. S., & Baloglu, S. (2011). Effects of gender and expertise on consumers' motivation to read online hotel reviews. *Cornell Hospitality Quarterly*, 52(4), 399–406.
- Lee, M. J., Singh, N., & Chan, E. S. (2011). Service failures and recovery actions in the hotel industry: A text-mining approach. *Journal of Vacation Marketing*, 17(3), 197–207.
- Leung, D., Law, R., Van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel and Tourism Marketing*, 30(1–2), 3–22.
- Levy, S. E., Duan, W., & Boo, S. (2013). An analysis of one-star online reviews and responses in the Washington D.C., lodging market. *Cornell Hospitality Quarterly*, 54(1), 49–63.
- Litvin, S. W., Goldsmith, R. E., & Pan, B. (2008). Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*, 29(3), 458–468.
- Liu, B. (2010). Sentiment analysis and subjectivity. In *Handbook of natural language processing*. Boca: Taylor and Francis Group
- Liu, B. (2012). Sentiment analysis and opinion mining. *Synthesis Lectures on Human Language Technologies*, 5(1), 1–167.
- Liu, S., Law, R., Rong, J., Li, G., & Hall, J. (2013). Analyzing changes in hotel customers' expectations by trip mode. *International Journal of Hospitality Management*, 34, 359–371.
- Liu, Z., & Park, S. (2015). What makes a useful online review? Implication for travel product websites. *Tourism Management*, 47, 140–151.
- Martínez-Cámara, E., Martín-Valdivia, M. T., Urena-López, L. A., & Montejo-Ráez, A. R. (2014). Sentiment analysis in twitter. *Natural Language Engineering*, 20(01), 1–28.

- Munar, A., Gyimóthy, S., & Cai, L. (2013). Tourism social media: A new research agenda. *Tourism Social Media*. Tourism Social Science Series (Vol. 18, pp. 1–15). Bingley: Emerald Group Publishing Limited.
- Ng, E., & Lien, C. Y. (2014). Impact of social media in service innovations: An empirical study on the Australian hotel industry. In *Quality innovation: knowledge, theory, and practices* (pp. 390–405). Pennsylvania: IGI Global.
- O'Connor, P., 2008. User-generated content and travel: A case study on TripAdvisor.com. In: O'Connor, P., Höpken, W., Gretzel, U. (Eds.), *Information and communication technologies in tourism*, (Vol. 2008, pp. 47–58). Vienna, Austria: Springer.
- Pang, B., & Lee, L. (2008). Opinion mining and sentiment analysis. *Foundations and Trends® in Information Retrieval*, 2(1–2), 1–135.
- Park, S.-Y., & Allen, J. P. (2013). Responding to online reviews: Problem solving and engagement in hotels. *Cornell Hospitality Quarterly*, 54(1), 64–73.
- Ramanathan, U., & Ramanathan, R. (2011). Guests' perceptions on factors influencing customer loyalty: An analysis for UK hotels. *International Journal of Contemporary Hospitality Management*, 23(1), 7–25.
- Rossetti, M., Stella, F., Cao, L., & Zanker, M. (2015). Analysing user reviews in tourism with topic models. In *Information and Communication Technologies in Tourism 2015* (pp. 47–58). Switzerland: Springer International Publishing.
- Schuckert, M., Liu, X., & Law, R. (2015). Hospitality and tourism online reviews: Recent trends and future directions. *Journal of Travel & Tourism Marketing*, 32(5), 608–621.
- Truchot, C. (2002). *Key aspects of the use of English in Europe*. Unpublished Report, DGIV, Council of Europe, Strasbourg. Available at: <http://www.coe.int/t/dg4/linguistic/source/truchoten.pdf>
- Wirtz, J., & Chew, P. (2002). The effects of incentives, deal proneness, satisfaction and tie-strength on word-of-mouth behavior. *International Journal of Service Industry Management*, 13(2), 141–162.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179–188.
- Ye, Q., Zhang, Z., & Law, R. (2009). Sentiment classification of online reviews to travel destinations by supervised machine learning approaches. *Expert Systems with Applications*, 36(3), 6527–6535.
- Ye, Q., Law, R., Gu, B., & Chen, W. (2011). The influence of user-generated content on traveler behavior: An empirical investigation on the effects of e-word-of-mouth to hotel online bookings. *Computers in Human Behavior*, 27(2), 634–639.
- Zhang, Z., Zhang, Z., Wang, F., Law, R., & Li, D. (2013). Factors influencing the effectiveness of online group buying in the restaurant industry. *International Journal of Hospitality Management*, 35, 237–245.
- Zick, A., Küpper, B., & Hövermann, A. (2011). *Intolerance, Prejudice and Discrimination-A European Report*.



# Contextual Information Elicitation in Travel Recommender Systems

Matthias Braunhofer and Francesco Ricci

**Abstract** Context-Aware Recommender Systems are advisory applications that exploit users' preference knowledge contained in datasets of context-dependent user ratings, i.e., ratings augmented with the description of the contextual situation detected when the user experienced the item and rated it. Since the space of context-dependent ratings increases exponentially in size with the number of contextual factors, and because certain contextual information is still hard to acquire automatically (e.g., the user's mood or the travellers' group composition), it is fundamental to identify and acquire only those factors that truly influence the user preferences and consequently the ratings and the recommendations. In this paper, we propose a novel method that estimates the impact of a contextual factor on rating predictions and adaptively elicits from the users only the relevant ones. Our experimental evaluation, on two travel-related datasets, shows that our method compares favorably to other state-of-the-art context selection methods.

**Keywords** Context-Aware Recommender Systems • Travel Recommender Systems • Context Acquisition

## 1 Introduction

Decision-making is part of our everyday lives. However, often the presence of too many choices, the lack of complete knowledge of the decision space, and pressing time constraints make decision-making hard. Recommender Systems (RSs) help to overcome this problem by providing users with selected (information) items that are relevant to their personal needs and preferences (Ricci, Rokach, & Shapira, 2011). The generated suggestions are typically obtained by comparing the user's profile, which models the user's preferences based on her past behavior (e.g., items previously viewed and/or numerical ratings given to these items), with the descriptions of items (content-based approach) or with the profiles of other users (collaborative-filtering approach).

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Context-Aware Recommender Systems (CARSS) are special RSs that generate more relevant recommendations by adapting to the specific contextual situations of the user and the recommended items (e.g., weather, temperature, season, and companion) (Adomavicius, Mobasher, Ricci, & Tuzhilin, 2011). For instance, Foursquare<sup>1</sup> and Yelp<sup>2</sup> consider not only the user's past behavior (i.e., previous browsing history, ratings and check-in history) but also the user's current geographic location in order to deliver more useful points of interest (POIs) recommendations to their users. The design and development of successful CARSS must address many challenges (Baltrunas, Ludwig, Peer, & Ricci, 2012). First, it requires to discover the contextual factors that could potentially influence the users' individual preferences (ratings) and the decision-making process, and hence are worth to be collected from the users along with the ratings, either automatically (e.g., the time, or the location), or by querying the user. This can be viewed as a reinforcement learning problem where the goal is to learn which actions to perform (what contextual factors to ask) in order to maximize a reward – in this case the recommendation performance. The second challenge is to develop an effective predictive model that, using a small number of samples of the user evaluations of items in certain contexts, can predict how the ratings change as a function of the different contextual situations. Finally, the design of a proper human-computer interaction layer on top of the predictive model is the last but not least challenge of building a CARSS.

In this paper, focusing on tourism applications, we tackle the first and last challenge which are quite interrelated since the knowledge of the relevant contextual factors that truly influence the user's rating for a point of interest enables the implementation of simpler and more convenient rating user interfaces and recommender systems. In order to address these tasks, we apply a novel context relevance identification method that we have recently proposed in a workshop paper (Braunhofer, Fernández-Tobías, & Ricci, 2015).

Unlike current state-of-the-art context selection strategies, which measure the relevance of contextual factors on a global basis and a posteriori (selecting relevant contextual information after all the information is acquired), our strategy dynamically and adaptively selects the contextual factors to be elicited from the user when she enters a rating for an item. We believe that our method suits particularly tourism applications that are characterized by a large number of potentially relevant contextual factors and by very sparse ratings data sets. We compare our proposed method with several state-of-the-art context selection strategies in an offline experiment on two context-dependent tourism rating datasets, i.e., datasets of ratings for items tagged with the contextual situations of the user while experiencing the rated item. The results show that the proposed parsimonious and personalized acquisition of relevant contextual factors is efficient, effective, and allows to elicit information

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<sup>1</sup> <https://foursquare.com/>

<sup>2</sup> <http://www.yelp.com/>

that best improve the recommendation performance in terms of accuracy and precision.

The rest of the paper is structured as follows. In Sect. 2, we review the related work. Section 3 introduces our main application scenario. Section 4 presents in detail the proposed context acquisition method. Then, we describe the experimental evaluation in Sect. 5, and detail the obtained results in Sect. 6. Finally, conclusions are drawn and future work directions are described in Sect. 7.

## 2 Related Work

Previous research on identifying relevant contextual information in CARS has explored two types of methods: (a) identifying a priori the factors that should be considered by the system, or (b) selecting, a posteriori, after the ratings and context data is acquired, the factors most influential for computing rating predictions.

The first method is exemplified in (Baltrunas et al., 2012), where the authors present a survey-based approach aimed at identifying the contextual information that is relevant for a mobile tourism recommender system. They first estimated the dependency of the user preferences from an initial candidate set of contextual factors. This was achieved through a web tool, in which users were requested to evaluate if a particular contextual condition (e.g., “you are on a wellness trip”, “it is a cold day”, “it is raining”) has a positive, negative or no influence on the user’s rating of a particular type of POI (e.g., spa, cycling, museum). Using the obtained data, they were able to select the most important contextual factors for different types of POIs. Then, ratings and contextual information for the selected factors that were obtained in the second step were used to train a context-aware matrix factorization model and to provide users with context-dependent recommendations in a mobile application for iPhone.

Odić, Tkalčić, Tasić, & Košir, 2012 identify two approaches to deal with both of these tasks: the first one is defined as “assessment” and it is based on surveying the users, while the second is denoted as “detection” of the context relevance and is performed by mining the rating data. In order to determine which of these two approaches is better, they used real movie rating data, and survey data in which users were asked to rate the influence of each contextual condition on their rating behaviour. Based on the obtained results, they concluded that the detection method performs better than the assessment one for identifying the contextual factors to be exploited in the rating prediction model.

In a related paper (Odić, Tkalčić, Tasić, & Košir, 2013) the same authors investigated in more detail the “detection” approach and provided several statistical measures for relevant-context detection, i.e., unalikeability, entropy, variance,  $\chi^2$  test and Freeman-Halton test. Among these measures, they found the Freeman-Halton test as the most useful and flexible measure to identify the relevant and irrelevant contextual factors in the LDOS-CoMoDa rating database. Moreover, the authors showed that the rating prediction performance was significantly better by

using the relevant contextual factors rather than by using the contextual factors detected as irrelevant.

Another example of a posteriori selection of the most relevant contextual factors can be found in (Vargas-Govea, González-Serna, & Ponce-Medellin, 2011). In this paper, the authors focus on a CARS for restaurants, and show that its efficiency and predictive accuracy can be improved by using a reduced subset of contextual factors. To select contextual factors, the Las Vegas Filter (LVF) algorithm was chosen. LVF repeatedly generates random subsets of factors, computes their evaluation measure based on an inconsistency criterion, which tests the extent to which a reduced subset can still predict the rating values, and finally returns the subset yielding the best evaluation measure.

We note that the idea of parsimoniously and adaptively selecting the relevant contextual factors to be elicited from the user when she enters a rating for an item has been initially developed in our previous workshop paper (Braunhofer et al., 2015). Here, we focus on the tourism domain. Moreover, we update the evaluation procedure so that it can also be used on datasets of context-dependent ratings for which only a subset of the contextual factors is known.

### 3 Application Scenario

Our target application is a mobile CARS called STS (South Tyrol Suggests) (Braunhofer, Elahi, & Ricci, 2014)—available on Google Play Store—that recommends POIs to visit in the South Tyrol region of Italy. STS can generate recommendations (Fig. 1 left) adapted to the user's and items' current contextual situation by exploiting a total of 14 contextual factors whose conditions (values) are either acquired automatically by the system (e.g., weather at the POI, season, daytime) or (optionally) entered by the user through an appropriate screen (e.g., user's budget, companion, feeling), as shown in Fig. 2 (right). More information about the used contextual factors and their possible values, which are called contextual conditions, can be obtained from Table 1. The user's preference model is learned using a set of in-context ratings that the system actively collects from the users and that describe the users' evaluations for the POIs together with the contextual situations in which the users visited the POIs (see Fig. 2). However, in our application scenario, given the relatively large number of contextual factors we faced the problem of choosing which contextual factors to definitely ask to the user upon rating a POI. This is an important and practical problem: asking the value of all the contextual factors is not possible, as it would take too much time and effort for the user to specify them. Moreover, asking the wrong subset of contextual factors may jeopardize the prediction model and result in poor recommendations.

Hence, in this paper we propose a novel method that is able to dynamically and adaptively identify the most important contextual factors to be elicited from a specific user upon rating a particular POI. Referring to Fig. 2, by means of our proposed method, we can identify for instance the three most relevant contextual

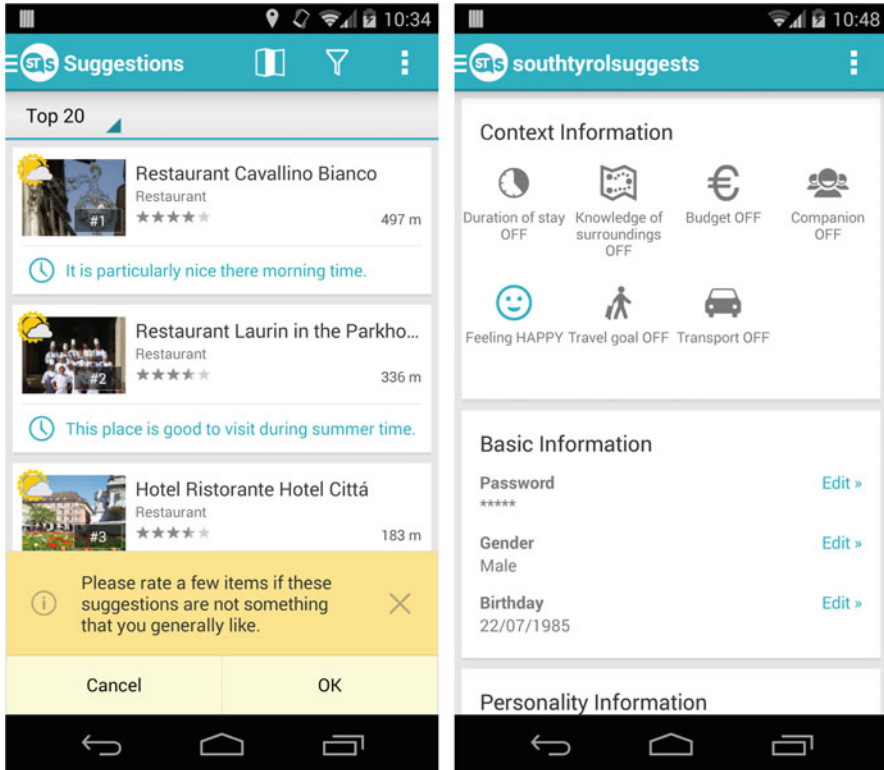


Fig. 1 Context-aware suggestions in STS

factors for the restaurant “Paulaner Stuben” (i.e., distance, crowdedness and time of day) and then present the user with three screens only, that step-by-step elicit the contextual conditions for these factors. Otherwise, the user would be required to go through 14 screens, one for each available contextual factor.

#### 4 Parsimonious and Adaptive Context Acquisition

CARSs can generate recommendations only after having gathered ratings augmented with information about the contextual conditions (values of the contextual factors) observed at the time the item was experienced and rated by the user. This is where parsimonious and adaptive context acquisition comes in. It tries to predict, for a given user-item pair, the most useful contextual factors, i.e., those that when elicited together with the rating from the user improve more the quality of future recommendations, both for that user and for other users of the system. “Parsimonious” means that it selectively requests and possibly elicits only the most relevant

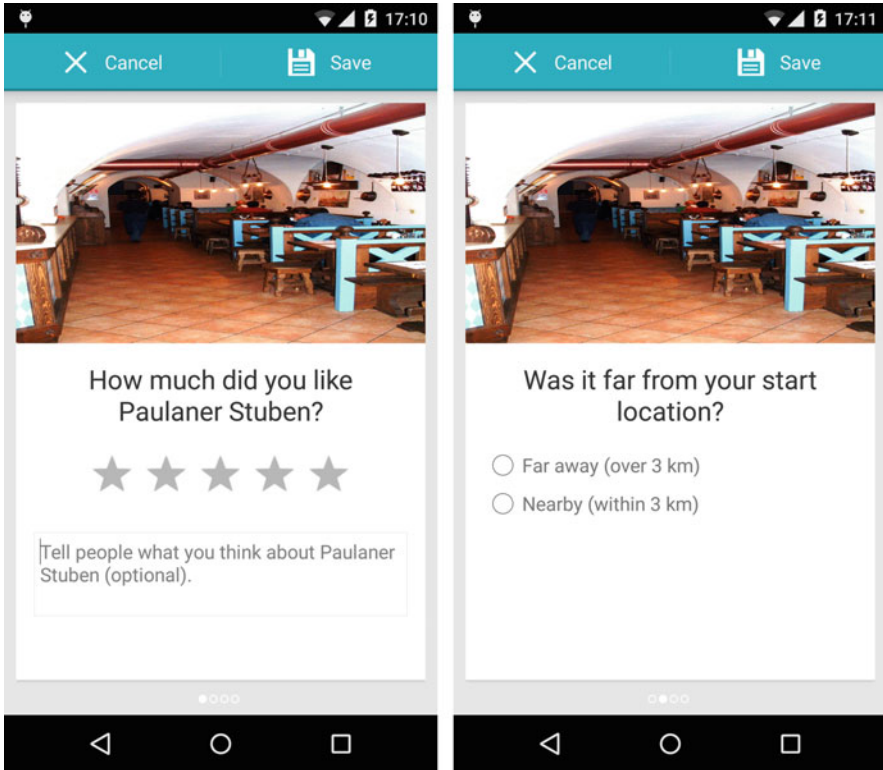


Fig. 2 Rating interface of STS

contextual factors, whereas “adaptive” means that it personalizes the selection of the most relevant contextual factors to each individual user and item.

Before presenting the proposed selective context acquisition method we introduce the CARS rating prediction model it relies on. It is a new variant of the Context-Aware Matrix Factorization (CAMF) model that treats contextual conditions similarly to either item or user attributes and uses a distinct latent factor vector corresponding to each user- and item-associated attribute. More specifically, a contextual condition is treated as a user attribute if it corresponds to a dynamic characteristic of a user, e.g., the mood, budget or companion of the user, whereas it is considered as an item attribute if it describes a dynamic characteristic of an item, e.g., the weather and temperature at a POI. The model is scalable and flexible, and is able to capture latent correlations and patterns between a potentially wide range of knowledge sources (e.g., users, items, contextual conditions, demographics, item categories), making it ideal to derive the usefulness of contextual factors in rating prediction.

Given a user  $u$  with user attributes  $A(u)$ , an item  $i$  with item attributes  $A(i)$  and a contextual situation consisting of the conjunction of individual contextual conditions  $c_1, \dots, c_k$  that can be decomposed into the subset of user-related contextual

**Table 1** Contextual factors used in STS

Contextual factors	Associated contextual conditions
Weather	Clear sky, sunny, cloudy, rainy, thunderstorm, snowing
Season	Spring, summer, autumn, winter
Budget	Budget traveler, high spender, none of them
Daytime	Morning, noon, afternoon, evening, night
Companion	Alone, with friends/colleagues, with family, with girlfriend/boyfriend, with children
Feeling	Happy, sad, excited, bored, relaxed, tired, hungry, in love, loved, free
Weekday	Working day, weekend
Travel goal	Visiting friends, business, religion, health care, social event, education, scenic/landscape, hedonistic/fun, activity/sport
Transport	No transportation means, a bicycle, a motorcycle, a car, public transport
Knowledge of the travel area	New to area, returning visitor, citizen of the area
Crowdedness	Crowded, some people, almost empty
Duration of stay	Some hours, one day, more than one day
Temperature	Burning, hot, warm, cool, cold, freezing
Distance	Far away (over 3 km), nearby (within 3 km)

conditions  $C(u)$  and the subset of item-related contextual conditions  $C(i)$ , the CARS model predicts a rating using the following rule:

$$\hat{r}_{uic_1, \dots, c_k} = \left( q_i + \sum_{a \in A(i) \cup C(i)} x_a \right)^T \left( p_u + \sum_{b \in A(u) \cup C(u)} y_b \right) + \bar{r}_i + b_u, \quad (1)$$

where  $q_i$  is the latent vector associated to item  $i$ ,  $p_u$  is the latent vector associated to user  $u$ ,  $x_a$  is the latent factor vector associated to an attribute of item  $i$ , that may either describe a conventional attribute (e.g., genre, item category) or a contextual attribute (e.g., weather, temperature),  $y_b$  is the latent factor vector associated to an attribute of user  $u$ . Finally,  $\bar{r}_i$  is the average rating for item  $i$ , and  $b_u$  is the bias associated to user  $u$ , which indicates the observed deviation of user  $u$ 's ratings from the global average.

The proposed context selection strategy is called *Largest Deviation*. Differently from the state-of-the-art context / feature selection strategies, it personalizes the selection of the contextual factors to ask to the user when rating an item by computing a personalized relevance score for a contextual factor  $C_j$  and user-item pair  $(u, i)$ . To achieve this, for each user  $u$  and item  $i$  pair (whose rating is acquired) it first measures the ‘‘impact’’ of each contextual condition  $c_j \in C_j$ , denoted as  $\hat{w}_{uic_j}$ , by calculating the absolute deviation between the rating prediction when the condition holds (i.e.,  $\hat{r}_{uic_j}$ ) and the predicted context-free rating (i.e.,  $\hat{r}_{ui}$ ):

$$\hat{w}_{uic_j} = f_{c_j} \left| \hat{r}_{uic_j} - \hat{r}_{ui} \right|, \quad (2)$$

where  $f_{c_j}$  denotes the normalized frequency of the contextual condition  $c_j$ , and is calculated as the fraction of ratings in the entire dataset that are tagged with contextual condition  $c_j$  (i.e.,  $\frac{|R_{c_j}|}{|R|}$ ). The normalized frequency adjusts the raw absolute deviation by taking into account that the contextual conditions with largest frequency are more reliable. For example, suppose that you want to estimate the impact of Sunny weather on the user-item pair (*Alice*, *Skiing*). Now, say that the rating prediction for Alice of Skiing is 5 under Sunny weather (i.e.,  $\hat{r}_{Alice\ Skiing\ Sunny} = 5$ ), and that the corresponding context-free rating prediction is 3.5 (i.e.,  $\hat{r}_{Alice\ Skiing} = 3.5$ ). Furthermore, assume that 20 % of the ratings in the rating dataset are tagged with Sunny weather. Then, the impact of Sunny weather on the user-item pair (*Alice*, *Skiing*), i.e.,  $\hat{w}_{Alice\ Skiing\ Sunny}$ , would be 0.3 ( $0.2 \cdot |5 - 3.5|$ ).

Finally, these individual scores for the contextual conditions are then aggregated into a single relevance score for the contextual factor  $C_j$  by simply computing the arithmetic mean of the scores of the various conditions/values for that contextual factor. We conjectured that the contextual factors with the largest estimated deviation are more useful to optimize the system performance.

## 5 Experimental Evaluation

### 5.1 Datasets

In order to evaluate the proposed selective context acquisition method, we have considered two context-dependent POI rating datasets with different characteristics. Table 2 provides some descriptive statistics of both datasets.

- The *STS* dataset was collected via our STS app that we mentioned in Sect. 3. It contains ratings acquired in contextual situations described by the conjunction of several conditions from up to 14 different factors, such as weather, temperature, weekday and companion. In addition to the ratings data, this dataset also includes general user information (i.e., age, gender and the Big-5 personality trait scores) as well as content (POI) metadata in the form of category information.

**Table 2** Datasets' characteristics

Dataset	STS	TripAdvisor
Rating scale	1–5	1–5
Ratings	2534	4147
Users	325	3916
Items	249	569
Contextual factors	14	3
Contextual conditions	57	31
Avg. # of conditions/rating	1.49	3
User attributes	7	2
Item attributes	1	12



- The *TripAdvisor* dataset is a dataset that we crawled from the TripAdvisor website. It contains ratings for POIs in the South Tyrol region of Italy that are tagged with contextual situations described by the conjunction of contextual conditions coming from three contextual factors, namely, type (e.g., couple, family or business trip), month (e.g., January, February) and year (e.g., 2015, 2014) of the trip. Additionally, also the TripAdvisor dataset has well-defined user (e.g., user location, member type) and POI attributes (e.g., item type, amenities, item locality).

It is important to note that the STS dataset, differently from the TripAdvisor dataset, contains ratings augmented with the knowledge of only a *subset* of all the contextual factors. Indeed, in STS when a user rates a POI she commonly specifies only the values of maximum four of the fourteen contextual factors that the system manages. As we will describe in Sect. 5.2, the lack of knowledge of all the contextual factors for each rating implied that during the simulated interactions not always all the values of the contextual factors identified by the proposed method could be acquired.

## 5.2 Evaluation Procedure

We have performed an offline evaluation aimed at matching as closely as possible the user interaction with a context selection strategy when it will be deployed in our STS system. In particular, in this offline evaluation we have simulated system/user interactions where the users rate items specifying only the values of contextual factors (contextual conditions) that have been identified by a context selection strategy. To achieve this, we adapted a procedure that was employed to evaluate active learning strategies for RSs (Elahi, Ricci, & Rubens, 2013).

This procedure first randomly partitions all the available ratings into three subsets in the ratio 25:50:25 %, respectively: (i) *training set*, which contains the ratings that are used to train the context acquisition strategies; (ii) *candidate set*, containing the ratings that can be potentially transferred into the training set with the contextual conditions matched by the context acquisition strategies; and (iii) *testing set*, which contains the share of the ratings (not considered in system training) that is used for calculating various performance metrics (see below). Secondly, for each user-item pair  $(u, i)$  in the candidate set, the  $N$  most relevant contextual factors according to a context usefulness strategy are computed, with  $N$  (in different experiments) varying from 1 to the total number of contextual factors in the rating dataset, and the corresponding rating  $r_{uic}$  in the candidate set is transferred to the training set as  $r_{uic'}$  with  $c' \subseteq c$  containing the associated contextual conditions for these contextual factors, if any. Finally, the evaluation metrics are measured on the testing set, after training the rating prediction model on the new extended training set. The above process is repeated 20 times with different random seeds and the results were averaged over the splits to yield more robust estimates (i.e., repeated random sub-sampling validation (Kohavi, 1995)).

For exemplifying the selective acquisition of contextual factors, consider the case that the top 2 contextual factors for the user-item pair (*Alice*, *Skiing*) are *Season* and *Weather*, and *Alice*'s rating was  $r_{\text{Alice Skiing Winter,Sunny,Warm,Morning}} = 5$ , then  $r_{\text{Alice Skiing Winter,Sunny}} = 5$  was added to the training set. In order to assess the system performance on the test set we have used the following evaluation measures: user-averaged MAE (U-MAE) and Precision@10. U-MAE is an error metric that measures the capability of the system to accurately estimate the ratings users would give to items, whereas Precision@10 is an accuracy metric that measures the effectiveness of top-10 recommendation, i.e., the capability of the system to accurately select ten items that the user will like (Herlocker, Konstan, Terveen, & Riedl, 2004).

We also note that in the TripAdvisor dataset we could always acquire the contextual conditions for the top contextual factors since here all the considered contextual factors are specified for each rating. Conversely, in the STS dataset each rating is augmented with the knowledge of only a (rating dependent) subset of the contextual factors that the system manages. Hence, in the evaluation process it often happens that only a subset of the top contextual factors identified by the method could be really acquired and transferred to the training set along with the rating. This is a more realistic scenario since in the actual system/user interaction one cannot assume that the user will always enter all the requested contextual factors.

### 5.3 Baseline Methods for Evaluation

We have compared the performance of our proposed *Largest Deviation* method with the following three state-of-the-art context/feature selection strategies: (i) *Mutual Information*, which, given a user-item pair ( $u, i$ ), computes the relevance for contextual factor  $C_j$  as the normalized mutual information between the ratings for items belonging to  $i$ 's category and  $C_j$  (Baltrunas et al., 2012); (ii) *Freeman-Halton Test*, which calculates the relevance of a contextual factor  $C_j$  using the Freeman-Halton test (Odić et al., 2013); and (iii) *Minimum Redundancy Maximum Relevance (mRMR)*, which ranks each contextual factor  $C_j$  according to its relevance to the rating variable and redundancy to other contextual factors (Peng, Long, & Ding, 2005).

Table 3 gives an overview of all the tested methods. As can be seen, *Largest Deviation* is the only strategy that personalizes the selection of the most relevant

**Table 3** Overview of the tested context acquisition strategies

Strategy	User Personalization	Item Dependence
Largest deviation	✓	✓
Mutual information	□	✓
Freeman-Halton Test	□	□
mRMR	□	□

contextual factors to each individual user and item. *Mutual Information* depends on the item category but is not personalized to the user, i.e., the same  $N$  contextual factors are asked to be specified by any user upon rating an item belonging to a particular category. Finally, *Freeman-Halton Test* and *mRMR* are calculated on a global basis without considering rating differences between users and items.

## 6 Evaluation Results

Figures 3 and 4 show the U-MAE and Precision@10 results of the CARS algorithm obtained by applying the various context acquisition strategies on the STS and TripAdvisor dataset, respectively. In the figures, the x-axis represents the number of

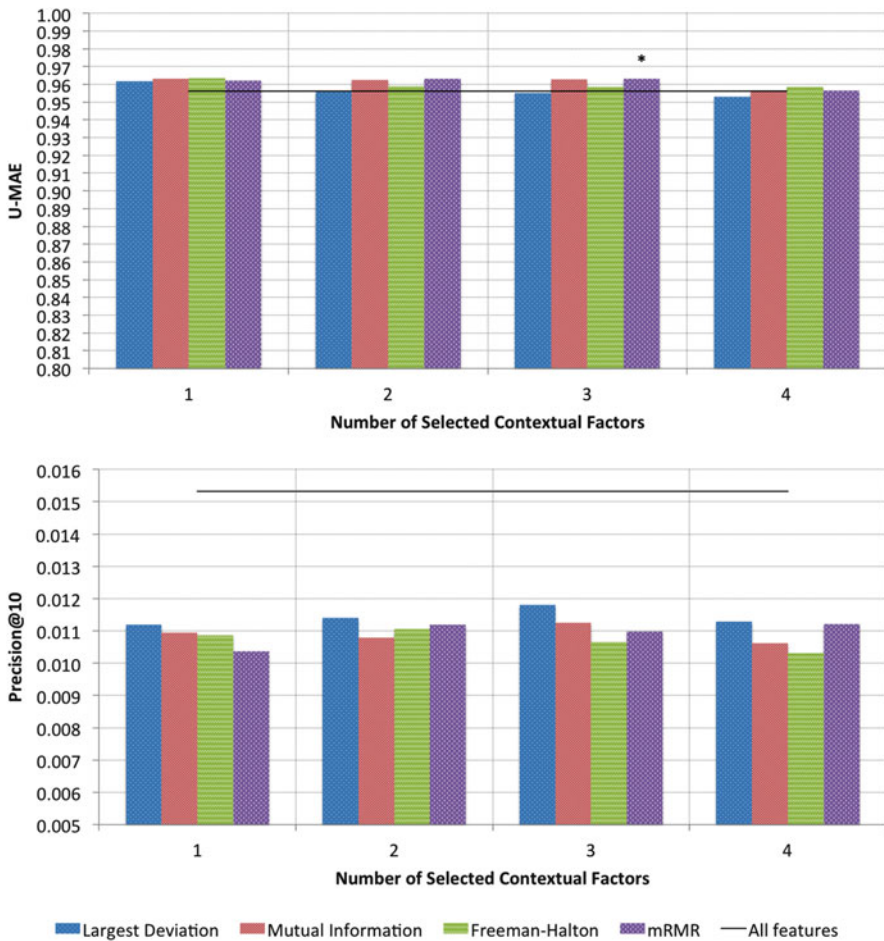


Fig. 3 Accuracy and precision results for the STS dataset

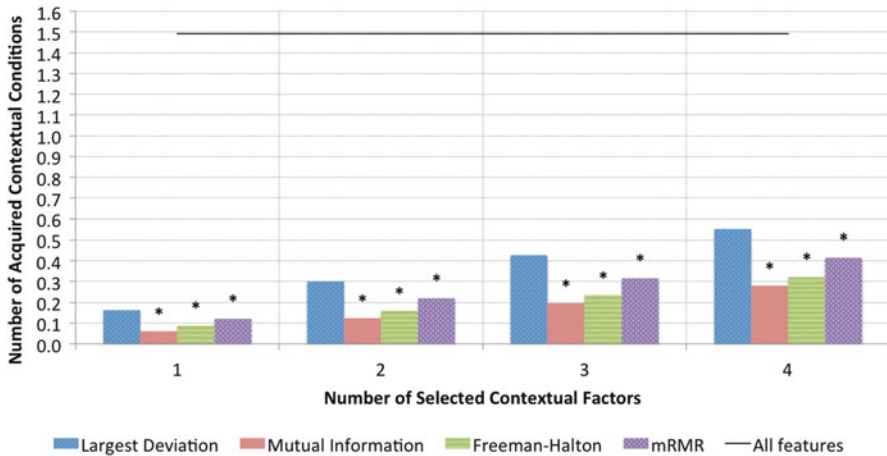


Fig. 4 Number of acquired contextual conditions for the STS dataset

acquired contextual factors, and statistically significant improvements (paired  $t$ -test,  $p < 0.05$ ) of the proposed *Largest Deviation* strategy over the other considered strategies are indicated by asterisks on top of the bars. For the STS dataset, the best U-MAE (lower is better) and Precision@10 (higher is better) results were achieved for *Largest Deviation*, even though these improvements were not statistically significant. We note that in the graph the number of selected contextual factors goes only up to 4 (out of 14) in order to focus the presentation on the selection of a small subset of factors.

An interesting observation in the STS dataset can be made by looking at the average number of contextual conditions acquired by the considered context acquisition strategies. This is shown in Fig. 5. We can observe that the best context acquisition strategy is *Largest Deviation*, which is able to acquire 0.16, 0.30, 0.43 and 0.55 contextual conditions, on average for each rating, when the top 1, 2, 3 and 4 contextual factors are asked from the user to specify, respectively. Hence, it clearly outperforms all the other state-of-the-art context selection strategies, which acquire significantly less contextual conditions. Thus, there is some evidence that our proposed *Largest Deviation* strategy can better estimate which contextual factors are truly relevant and can be acquired from the user upon rating an item.

Looking at the results for the TripAdvisor dataset, one can find that here only minor differences (especially in Precision@10) between the considered context acquisition strategies are present, which is due to the fact that in this dataset in total only three contextual factors are available, thus providing only little potential for personalization in contextual factor selection. Nevertheless, it can be seen that *Largest Deviation* achieves a very good accuracy for the tested number of selected contextual factors (1–3), proving the efficiency and effectiveness of adapting the selection of the relevant contextual factors to the target user-item pair. Similarly, good accuracy results can also be observed for the Freeman-Halton Test when two factors are selected.

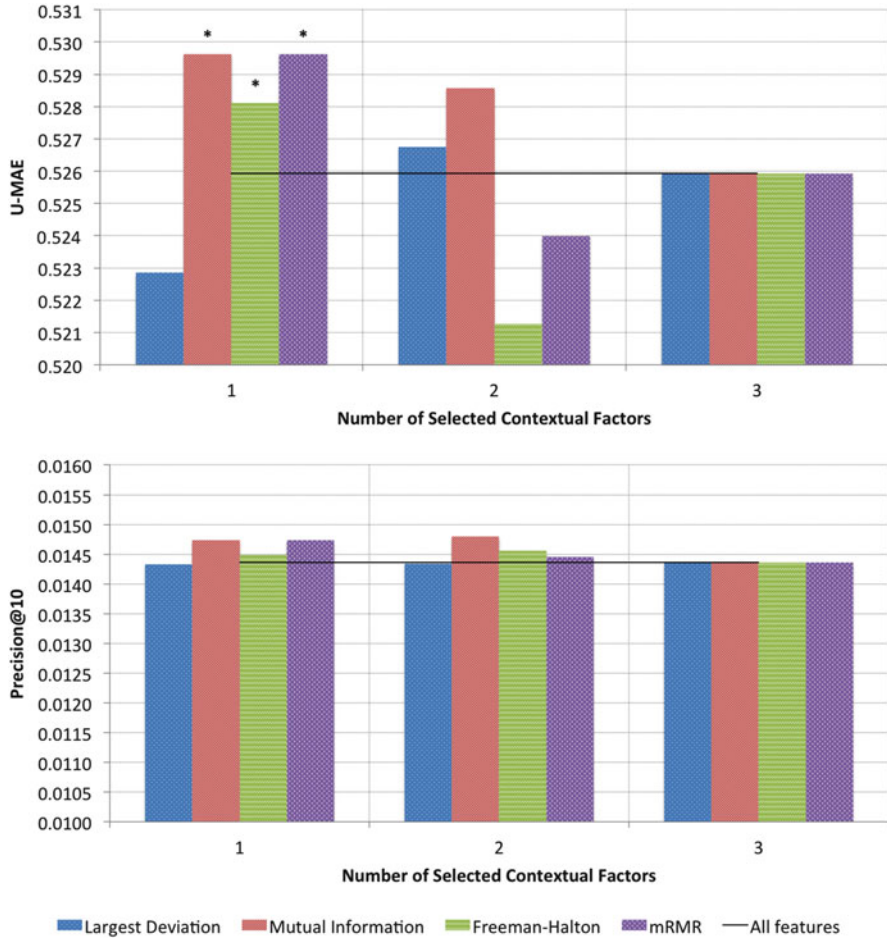


Fig. 5 Accuracy and precision results for the TripAdvisor dataset

## 7 Conclusions and Future Work

In this paper, we have proposed a new method for parsimonious context acquisition, i.e., for identifying, for a given user-item pair, the contextual factors that when acquired together with the rating from the user let the system to generate better predictions. This is an important and challenging problem for CARSs, since usually many contextual factors may be available, but only a small subset may be useful and should be asked to the user to avoid an unnecessary waste of time and effort as well as to avoid degradation of the recommendation model performance. We have formulated the experimental hypothesis that the proposed parsimonious and personalized context acquisition strategy elicits ratings with contextual information that improve more the recommendation performance, and compares favorably with

state-of-the-art alternatives. In an offline experiment we were able to confirm these hypotheses.

Parsimonious context acquisition is still a new topic, and there are some research questions that deserve future work. Firstly, one could analyze the effect on system performance of employing an active learning method for adaptively selecting both the items to rate and the contextual information to add. Secondly, it is interesting to understand how the proposed method can be improved, e.g., by considering possible correlations between contextual factors or using more sophisticated normalization techniques to normalize the raw absolute deviations of contextual conditions. Finally, we plan to perform a live user study by integrating the developed method into STS.

## References

- Adomavicius, G., Mobasher, B., Ricci, F., & Tuzhilin, A. (2011). Context-aware recommender systems. *AI Magazine*, 32(3), 67–80.
- Baltrunas, L., Ludwig, B., Peer, S., & Ricci, F. (2012). Context relevance assessment and exploitation in mobile recommender systems. *Personal and Ubiquitous Computing*, 16(5), 507–526.
- Braunhofer, M., Elahi, M., & Ricci, F. (2014). Usability assessment of a context-aware and personality-based mobile recommender system. In *E-commerce and web technologies* (pp. 77–88). Switzerland: Springer International Publishing.
- Braunhofer, M., Fernández-Tobias, I., & Ricci, F. (2015). Parsimonious and adaptive contextual information acquisition in recommender systems. In *Proceedings of IntRS'15*.
- Elahi, M., Ricci, F., & Rubens, N. (2013). Active learning strategies for rating elicitation in collaborative filtering: A system-wide perspective. *ACM Transactions on Intelligent Systems and Technology (TIST)*, 5(1), 13.
- Herlocker, J. L., Konstan, J. A., Terveen, L. G., & Riedl, J. T. (2004). Evaluating collaborative filtering recommender systems. *ACM Transactions on Information Systems (TOIS)*, 22(1), 5–53.
- Kohavi, R. (1995). A study of cross-validation and bootstrap for accuracy estimation and model selection. In *Ijcai* (Vol. 14, No. 2, pp. 1137–1145).
- Odić, A., Tkalcic, M., Tasic, J. F., & Košir, A. (2012). Relevant context in a movie recommender system: Users' opinion vs. statistical detection. *ACM RecSys*, 12.
- Odić, A., Tkalčič, M., Tasič, J. F., & Košir, A. (2013). Predicting and detecting the relevant contextual information in a movie-recommender system. *Interacting with Computers*, 25(1), 74–90.
- Peng, H., Long, F., & Ding, C. (2005). Feature selection based on mutual information criteria of max-dependency, max-relevance, and min-redundancy. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 27(8), 1226–1238.
- Ricci, F., Rokach, L., & Shapira, B. (2011). *Introduction to recommender systems handbook* (pp. 1–35). New York: Springer.
- Vargas-Govea, B., González-Serna, G., & Ponce-Medellin, R. (2011). Effects of relevant contextual features in the performance of a restaurant recommender system. In *ACM RecSys*, 11.

# Can We Predict Your Sentiments by Listening to Your Peers?

Julia Neidhardt, Nataliia Rümmele, and Hannes Werthner

**Abstract** Web sources of tourism services provide valuable resources of knowledge not only for the travellers but also for the companies. Tourism operators are increasingly aware that user related data should be regarded as an important asset. In this paper, user activities and interactions in the tourism domain are analysed. In particular, the emotions of the users regarding their forthcoming trips are studied with the objective to characterize interdependencies between them. Social network analysis is applied to characterize the interactions between the users. To capture their emotions, text mining techniques and sentiment analysis are applied to construct a measure, which is based on free-text comments in a travel forum. The experimental outcome provides some evidence that social influence between the users in the network exists.

**Keywords** Social Network Analysis • Social Influence • Sentiment Analysis • Travel Forum

## 1 Introduction

In recent years, the impact of the Web on almost all areas of modern society has tremendously increased. The tourism landscape has been also profoundly affected by the Web, giving rise to new directions of research in eTourism (Werthner et al., 2015). Together with this development, a number of online communities and their importance have grown. Today, they serve as platforms for people to communicate and to interact—both in people’s private lives and in business environments. As a consequence, the amount of available data and user generated content has exploded. Thus, this high quantity of data is a valuable resource for research because it enables to study the behaviour of people as well as their interactions. Furthermore, the huge amount of data has become an important asset of tourism companies. The advantages of properly handling data are manifold: from improving customer relationship management, both in terms of attracting new travellers and maintaining the existing ones, to identifying points for improvement and existing issues in the

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business. However, new challenges arise: how to manage data and to ensure its quality, how to preserve privacy of the customers, and how to mine valuable knowledge from it. With the development of new computational, mathematical and statistical methods that are able to process and to analyse large amounts of data, there are now a high number of techniques to analyse textual and relational data.

In this paper, user activities and interactions in the tourism domain are analysed. The objective of the study is to determine whether the users are influencing each other. Here, in particular, the emotions of the users are taken into consideration. Thus, the goal is to find out whether these emotions are interdependent. This leads to the following research question: Am I happy because my peers are happy?

To study this question, a travel related online forum is used where users are discussing their forthcoming trips. Social network analysis is applied to characterize the interactions between the users. To capture their emotions, a measure, which is constructed based on free-text comments in the forum, is assigned to the users. Here, text mining techniques and sentiment analysis are applied.

The main results of the study are: (1) A measure to capture the emotions of the user generated text is constructed. (2) A social influence model is built upon the network of users to capture interdependency between user emotions. (3) The experimental outcome provides some evidence that the users are influenced by the sentiments of their peers.

The rest of the paper is structured as follows. The state-of-the-art is discussed in the next section. In Sect. 3 the travel online forum, which provided data for the experimental setup, is described. In Sect. 4 the construction of the network of users of this forum is explained. The calculation of the measure to capture the sentiments in the text is presented in Sect. 5. Statistical models to evaluate the interdependency between the calculated measures are described in Sect. 6 together with the discussion of the experimental results. Finally, conclusions are drawn and directions for future work are outlined.

## 2 State-of-the-Art

Social network analysis has become a key method to analyse data that is generated online, e.g., by user interactions. Often questions of social influence are studied (Sun & Tang, 2011). Social influence occurs when individuals adapt their behaviour according to the behaviour of others in the network. In terms of social network analysis this means that given the edges (i.e., *connections*) between the nodes (i.e., *actors*) in the network, the nodal attributes (i.e., *behaviour* of the actors, or their *opinions* or *sentiments*) are influencing one another (i.e., the behaviour is *contagious*). It is quite challenging to verify whether social influence mechanisms in fact occur in a network. If the outcome behaviour is binary (e.g., a user is smoker or non-smoker) and longitudinal data exists, *SIENA models* can be applied (Steglich, Snijders, & Pearson, 2010). If cross-sectional data exists, *Autologistic Actor Attribute Models* can be used (Daraganova & Robins, 2013). The latter can be seen as a



generalization of logistic regressions for networks. However, if the outcome behaviour is continuous (e.g., a user is smoking  $n$  days a month), *Linear Network Autocorrelation Models* are appropriate. Those models are related to spatial regression methods. They can be considered as extensions of ordinary least squares (OLS) for networks since they can incorporate local effects (covariates) and interaction effects (network structure) (Leenders, 1997; Leenders, 2002). In literature, they are also called *Network Effects Models* (Doreian, 1989). However, all these models are very complex and/or do not scale.

There is a branch of research that addresses the influence maximization problem in social networks: the goal is to maximize the adoption of a product or the spread of an opinion by identifying appropriate seed users. Typically diffusion models and other computational models are used (e.g., Kempe, Kleinberg, & Tardos, 2003). However, statistical inference is usually not possible in such models. There is also research that aims at identifying influential users in online discussion forums. Here, typically users with high network centrality measures such as PageRank are considered as influential. Forum threads are used to derive user interaction networks as a basis for the analysis (Zhang, Ackerman, & Adamic, 2007).

The role of emotions in online forums and micro-blogging Web sites is in the focus of several studies. Connected users on Weibo, for example, show a strong sentiment correlation, especially if they interact a lot. However, negative emotions seem to have a higher impact than positive emotions (Fan, Zhao, Chen, & Xu, 2014).

To quantify the emotionality of a text or a user, often lexical-based sentiment analysis is chosen. The term *sentiment analysis* refers to approaches that aim at extracting subjectivity from text either to decide whether a text is objective or subjective or whether a subjective text is positive or negative. The lexicon-based approach utilizes sentiment dictionaries to quantify the subjectivity of a text by aggregating the sentiments assigned to the words in that text (Taboada, Brooke, Tofiloski, Voll, & Stede, 2011).

In (Gräbner, Zanker, Fliedl, & Fuchs, 2012) a lexicon-based approach is applied to relate tourism related reviews to their numerical rating. Using such an approach, the authors are able to classify reviews as “good” or “bad” in a quite accurate way. In (Schmunk, Höpken, Fuchs, & Lexhagen, 2013) statements about product properties of hotel reviews are extracted. Then it is tested whether those statements are subjective, and if so, whether they are positive or negative. The authors show that for subjectivity recognition the lexical based approach performs best compared to machine learning. In (Garcia, Gaines, & Linaza, 2012) an approach is introduced that makes use of lexical data bases to calculate sentiment scores for tourism related reviews. Unlike the mentioned studies above, the goal of this work is to extract sentiments from online travel forum and to identify the inter-dependency between them. Moreover, the suggested approach considers the emoticons as well as negation present in the text.

### 3 The Data

The analysis is done within a project with a start-up company. The name of the company cannot be disclosed due to contractual commitments.<sup>1</sup> This company is an online marketplace where group tours to over 200 countries of the world can be compared, booked and discussed. Details about a tour including the points of interests that are visited, the length of the tour, etc. are provided by the respective tour operator. After the tour, a traveller can leave a tour review on the platform. These reviews contain free-text and a five-stars rating for several categories (see also Neidhardt, Pobiedina, & Werthner, 2015).

An important feature of the platform is the discussion within *meets*. In these meets users are given the opportunity to engage online with co-travellers before the tour starts. Typically tour related questions are discussed here. The messages are usually short and are often written in moments when users are excited, i.e., after booking a tour or before the departure. Meets are organized as threads, i.e., sequences of messages that are posted as replies to one another. Every user can start a meet and several meets related to one tour can exist. Meets provide the opportunity to study interactions and possible influence between users, thus they are the focus of the work presented here.

The data for the study was received from the company as a dump of their MySQL database. Apart from the user generated free-text within the meets and reviews, the database contains meta-information about meets, tours and users of the platform. For each meet it is known when it was started, the comments it includes, when and by whom these comments were posted. Here the IP-addresses of the users are also stored. Furthermore, it is known to which tour the meet is assigned to as well as the date when the respective tour started. However, the latter has to be indicated by the users themselves with no restrictions and is, thus, a bit noisy. The available information about tours encompasses a number of attributes including tour length, destination, tour operator, maximum possible group size, and preferable age of the participants. User attributes include gender, location, birth date and language. Except for gender, these details are missing for the majority users. It is also known how active users are overall on the platform.

For the study that is presented here, all meets that were posted on the platform within a 30 days period, i.e., April 2013, are analysed. After dealing with some inconsistencies in the database and cleaning the data, the resulting sample has 3066 comments posted in 789 meets by 1270 distinct users. Thus, on average, each meet has 3.9 comments and each user posts 2,4 comments. Furthermore, 789 meets are related to 286 tours, i.e., per tour there are on average 2.8 meets taking place.

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<sup>1</sup> In order to ensure reproducibility, the disclosure for interested researches is possible.

### 4 The User Network

To study interactions and influence between the users on the platform, an undirected network is constructed the following way: the vertices of the network represent all users that were writing a comment in a meet in the selected period. Two users are connected by an edge if they were engaged in the same meet. Furthermore, a weight is assigned to the edge, which represents the number of different meets two connected users were part of. This process is illustrated in Fig. 1.

In the resulting network, 1270 users are connected by 2055 edges. Thus, on average, each user interacted with 3.2 others. This is also the average degree in the network. The highest degree is 22, i.e., there is one user who interacted with 22 others. On the other hand, there are 345 isolates (27.2 %) in the network. These users tried to initiate a conversation but nobody replied. Overall, the degree distribution resembles a power-law. Almost all edges have a weight equal to one; eleven edges have a weight equal to two, and one edge has a weight equal to three. This implies that only eleven pairs of users met in two different meets; and one pair of users even met in three different meets.

The network has a high number of small connected components. There are 228 connected components that consist of at least two nodes, and the largest component has 51 nodes. Thus, different regions of the network are hardly connected, but the nodes within a region are densely connected. This can clearly be seen in Fig. 2, where the global structure of the network is displayed. This is not surprising and only reflects the semantics of the constructed network, namely, that each user is typically going only on one tour in a certain period and is, thus, participating only in those meets which are related to that specific tour.

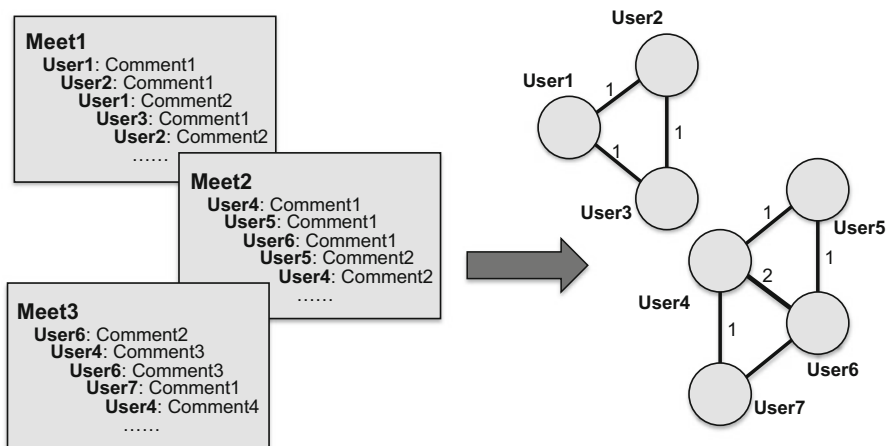
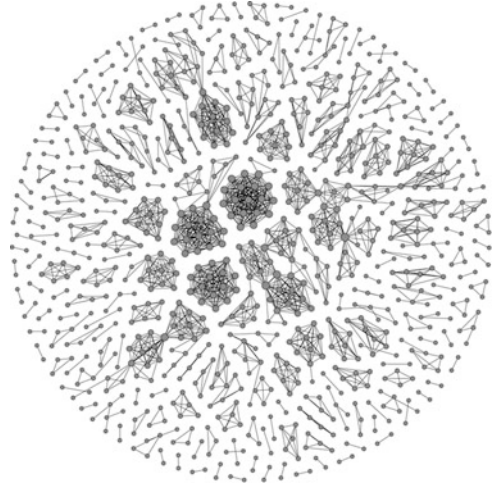


Fig. 1 Construction of a user network based on the meets

**Fig 2** Global structure of the user network (without isolates)



Due to the design of the network, the average clustering coefficient is very high (0.95). The clustering coefficient captures the probability that two randomly selected neighbours of a node (i.e., nodes that share an edge with the node) are also connected by an edge, and thus characterizes the local structure of a network. In the sample of this work, the female/male ratio is almost 3/1: among 1270 users 941 are female and 329 are male. There is no significant difference between the average degree of male and female users in the network, although men have a slightly higher average degree (3.37 vs. 3.18).

The country of origin of the users is not explicitly known. However, since users typically participate in a meet before a tour starts, the IP-addresses of the users when posting the comments are used to determine their country. For the vast majority of users (i.e., 1234 or 97.2 %) all their comments have the same country-code. For four users (0.3 %) the IP-addresses are missing, thus their country-code is unknown. For the rest (i.e., 32 or 2.5 %), different country-codes are assigned to their comments. Here, the country-code of her/his first comment is assigned to a user. Most of the users (492 or 38.7 %) were posting from Australia, 311 or 24.5 % from the United Kingdom, 143 or 11.3 % from Canada, 85 or 6.7 % from New Zealand, 70 or 5.5 % from the US, 25 or 2.0 % from South Africa and 13 or 1.0 % from Ireland. There are 47 further countries occurring in the sample but less than 1 % of the users were located in each of them so they are not considered further. The resulting distribution of countries shows that back in 2013 mainly Australians and people from other English speaking countries were using the platform. This clearly makes sense since the company was founded in Australia and only later moved to Europe.

## 5 Sentiment Scores

Focus of this work is the analysis of the emotions of the users and the interdependencies between those emotions. Thus, a measure, called *sentiment score*, is constructed with the aim to capture the state of mood of each user. This sentiment score is obtained with the help of a text mining procedure and is based on all free-text comments a user posted in April 2013.

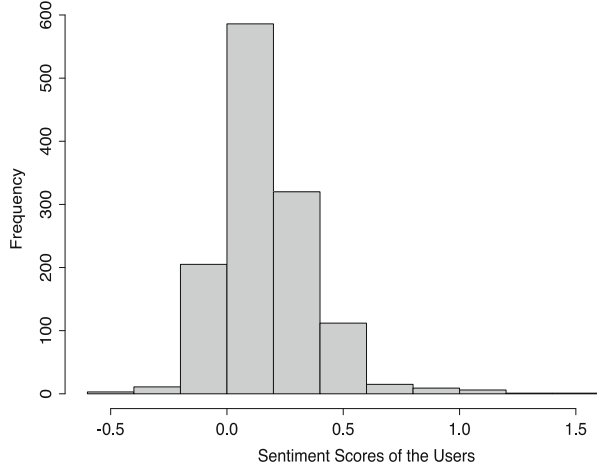
The procedure is as follows. Firstly, tokenization and part-of-speech (POS) tagging of the comments are performed (Bird, Klein, & Loper, 2009); afterwards, SentiWordNet (Baccianella, Esuli, & Sebastiani, 2010; Esuli & Sebastiani, 2006) is applied. However, note that in SentiWordNet a word with a specific meaning and POS tag is represented as a synset. Since a word can have different meanings depending on the context, a word can have several synsets, and all of them can have different positive and negative scores. For example, an adjective “poor” has three synsets. All of them have positive score equal to 0, but the first one has a negative score 0, the second one has 0.125, and the last one has 0.5. To resolve this issue, the average of the scores of all synsets is used (Taboada et al., 2011).

Furthermore, the presence of negation in the text is addressed as follows. Once a negation is encountered in the sentence, positive and negative scores for the rest of the tokens in the sentence are swapped (Miller, Sathi, Wiesenthal, Leskovec, & Potts, 2011). In this approach, emoticons are also taken into account. A sentiment score of 1.0 is assigned to positive emoticons and  $-1.0$  to negative emoticons. Their values are not swapped after a negation. For each sentence the sentiment score is calculated as a difference between positive and negative scores per each word and then summed up. Such approach allows to accurately capturing the overall sentiment in the sentence. For example, a sentence with an overall negative sentiment is “Sorry guys I’ve had to postpone my trip to Africa due to some unforeseen circumstances.” whereas “Woo can’t wait :)” has an overall positive sentiment score. “How’s everyone’s packing lists going?”, on the other hand is a rather neutral sentence.

Now, for each user her/his sentiment score is determined as an average of the scores of all sentences in all her/his comments posted in April 2013. The sentiment score of user 6 in Fig. 1, e.g., is the average of the sentiment score of the sentences in her/his comment 1, comment 2 and comment 3. In Fig. 3 the overall distribution of the sentiment scores is displayed. The average sentiment score is 0.17, the minimum sentiment score is  $-0.6$ , the maximum 1.63 and the median 0.13. Thus, most of the sentiment scores are positive. When considering female and male users separately, it turns out that there is a significant difference between their average sentiment scores (0.19 vs. 0.11,  $p$ -value  $< 0.001$ ). The reason for the positivity of the posted messages might be explained by the fact that future travellers are usually excited about their forthcoming tour.

Regarding the origin of users, the average sentiment scores of users from the US are significantly lower than those of users not from the US (0.10 vs. 0.17,  $p$ -value  $< 0.001$ ); the same holds for Canadians (0.12 vs. 0.18,  $p$ -value  $< 0.001$ ).

**Fig 3** Distribution of the users' sentiment scores



On the other hand, the average sentiment scores of users from the UK are significantly higher than the average sentiment scores of users not from the UK (0.20 vs. 0.16, p-value < 0.05). For the other countries there are no significant differences.

## 6 Influence Models and Results

To test whether the users influence each other regarding their emotions, *Linear Network Autocorrelation Models* are developed. These models are defined by the following equation:

$$y = \rho W y + X \beta + \varepsilon \quad (1)$$

Here, the vector  $y$  represents the outcome variable, i.e., the sentiment scores of the users in the network. However,  $y$  also appears on the right hand side of the equation as predictor variable. This captures the idea that the sentiment score of a user is influenced by the sentiment scores of all users that user is connected to. Thus, these scores are outcome and predictor variable at the same time. The weighted matrix  $W$  represents the structure of the network. This implies that only users can influence each other that are connected. The scalar  $\rho$  is called *autocorrelation* or *network effects parameter* and represents the strength of the social influence in the network. Thus, the first term in Eq. 1 captures the *contagion effect*. Furthermore, matrix  $X$  contains other predictor variables (covariates) and the vector  $\beta$  the corresponding parameters. Thus, the second term in Eq. 1 captures the *intrinsic opinion* of the users. The error term is represented by  $\varepsilon$ . If there are no network effects, i.e., the first

term equals 0, the model is equivalent to OLS (Doreian, 1989; Leenders, 1997; Leenders, 2002).

As discussed in Sect. 4, there is a difference in sentiment scores for females and males. Thus, gender is included as a predictor variable. Furthermore, two dummy variables are constructed: the first indicates whether a user is from the US or Canada and the second whether a user is from the UK. Those dummy variables are included into the model as predictor variables since users from these countries have on average a significant smaller (and respectively larger) sentiment score compared to the other users. The length of a tour (in weeks) and the number of comments written by a user are included as control variables.

In Table 1 the results of the models are displayed. In Model 1, the matrix  $W$  is set to zero; i.e., there are no network effects. This model is equal to OLS. Model 1 summarizes the previously discussed effects: females and users from the UK are more likely to have a higher sentiment score. On the other hand, users from the US and Canada have typically a lower sentiment score. The model also shows that users who plan a longer trip are more likely to have a higher sentiment score.

Model 2 takes network effects on the users' sentiment scores into consideration. The results show that a positive influence between the users' sentiment scores exists, since the network effects parameter  $\rho$  is clearly significant. Thus, the sentiment score of a user is influenced by the weighted linear combination of the sentiment scores of her/his peers. This implies that the more connections a user has, the higher the contribution of the network on her/his sentiment scores. Also, if two users meet in more than one discussion, the influence through this connection gets more important. All the other predictor variables show the same effects as in Model 1 (only being from the UK has slightly less impact and the length of a tour becomes less significant). This implies that the influence mechanism is an additional effect that impacts the sentiment score of a user. Thus, your sentiment scores can in fact be predicted by looking at your peers!

**Table 1** Linear Network Autocorrelation Models

	Model 1	Model 2
Gender Female	<b>0.14 (0.01)***</b>	<b>0.14 (0.01)***</b>
User from USA or Canada	<b>-0.04 (0.02)*</b>	<b>-0.04 (0.02)*</b>
User from the UK	<b>0.07 (0.01)***</b>	<b>0.06 (0.01)***</b>
Length of Tour in Weeks	<b>0.01 (0.00)***</b>	<b>0.01 (0.00)**</b>
Number of Comments by User	0.00 (0.00)	0.00 (0.00)
Network Effects		<b>0.02 (0.01)**</b>
R <sup>2</sup>	0.11	0.11
AIC	-377,11	-382,30
N	1270	1270

\*\*\* p < 0.001, \*\* p < 0.01, \* p < 0.05

## 7 Conclusions

The goal of this study is to determine whether the emotions of a user are influenced by the emotions of her/his peers. Based on the communication threads of the users, a network is constructed. To capture the influence between the users, statistical models for networks are used. The results imply that the emotions of the users are interdependent; a user seems to be influenced by the emotions of all her/his network connections. In future work, further techniques and refined modelling approaches will be applied to confirm these findings.

Since the outcome variable, i.e., the sentiment score of a user, is continuous, Linear Network Autocorrelation Models are appropriate. However, these models do not scale well, thus the observation period is quite short. For robustness tests other observation periods have been used, and there are no significant differences in the results. The assumption in this study is that all users in a thread are interacting with each other, i.e., their interactions are represented by an undirected network. This assumption is reasonable because of the short observation period. However, in this analysis it is not taken into account how many messages are posted within one thread. In a next step this will be taken into consideration when constructing the weighted network as more interactions might reinforce the influence.

The sentiment scores are extracted and assigned using an automated procedure. Although this approach has its limitations, it is state-of-the-art and well-accepted. However, compared to other studies, positive emotions are prevalent in the presented setting. In BBC online forums where political discussions are taking place, negative emotions are dominating (Chmiel et al., 2011). This clearly makes sense as people are typically in a good mood and excited when thinking about upcoming vacations. Here, no controversial discussions usually take place. The positive mood seems even reinforced by peers and co-travellers. Thus, the results imply that in the context of tourism positive emotions can be seen as an asset that influences others. However, the same is true for negative emotions. Future work will further deal with such questions, e.g., if bad mood in a forum can be changed by positive influence. Another issue is how sentiments in discussions before the tour influence the formation of the destination image and affect the overall satisfaction from the travel experience. This would enhance the study of destination branding and image (Költringer & Dickinger, 2015).

## References

- Baccianella, S., Esuli, A., & Sebastiani, F. (2010). SentiWordNet 3.0: An enhanced lexical resource for sentiment analysis and opinion mining. *LREC*, 10, 2200–2204.
- Bird, S., Klein, E., & Loper, E. (2009). *Natural language processing with Python*. California: O'Reilly.



- Chmiel, A., Sobkowicz, P., Sienkiewicz, J., Paltoglou, G., Buckley, K., Thelwall, M., et al. (2011). Negative emotions boost user activity at BBC forum. *Physica A: Statistical mechanics and its applications*, 390(16), 2936–2944.
- Daraganova, G., & Robins, G. (2013). Autologistic actor attribute models. In D. Lusher, J. Koskinen, & G. Robins (Eds.), *Exponential random graph models for social networks: Theory, methods and applications* (pp. 102–114). Cambridge: Cambridge University Press.
- Doreian, P. (1989). Models of network effects on social actors. In *Research methods in social network analysis* (pp. 295–317). Fairfax: George Mason University Press.
- Esuli, A., & Sebastiani, F. (2006). Sentiwordnet: A publicly available lexical resource for opinion mining. In *Proceedings of LREC* (Vol. 6, pp. 417–422).
- Fan, R., Zhao, J., Chen, Y., & Xu, K. (2014). Anger is more influential than joy: Sentiment correlation in Weibo. *PLoS ONE*, 9(10), e110184.
- Garcia, A., Gaines, S., & Linaza, M. T. (2012). A lexicon based sentiment analysis retrieval system for tourism domain. *e-Review of Tourism Research (eRTR)*, 10, 35–38.
- Gräbner, D., Zanker, M., Fliedl, G., & Fuchs, M. (2012). Classification of customer reviews based on sentiment analysis. In *Information and communication technologies in tourism* (pp. 460–470). Vienna, New York: Springer.
- Kempe, D., Kleinberg, J., & Tardos, É. (2003). Maximizing the spread of influence through a social network. In *Proceedings of the ninth ACM SIGKDD international conference on Knowledge discovery and data mining* (pp. 137–146). New York: ACM.
- Költringer, C., & Dickinger, A. (2015). Analyzing destination branding and image from online sources: A web content mining approach. *Journal of Business Research*, 68(9), 1836–1843.
- Leenders, R. T. A. J. (1997). Longitudinal behavior of network structure and actor attributes: Modeling interdependence of contagion and selection. In *Evolution of social networks* (pp. 165–184). London: Routledge.
- Leenders, R. T. A. J. (2002). Modeling social influence through network autocorrelation: Constructing the weight matrix. *Social Networks*, 24(1), 21–47.
- Miller, M., Sathi, C., Wiesenthal, D., Leskovec, J., & Potts, C. (2011). Sentiment flow through hyperlink networks. In *ICWSM*.
- Neidhardt, J., Pobiedina, N., & Werthner, H. (2015). What can we learn from review data? e-Review of Tourism Research (eRTR). In *ENTER 2015* (Vol. 6).
- Schmunk, S., Höpken, W., Fuchs, M., & Lexhagen, M. (2013). Sentiment analysis: Extracting decision-relevant knowledge from UGC. In *Information and Communication Technologies in Tourism 2014* (pp. 253–265).
- Steglich, C., Snijders, T. A., & Pearson, M. (2010). Dynamic networks and behavior: Separating selection from influence. *Sociological methodology*, 40(1), 329–393.
- Sun, J., & Tang, J. (2011). A survey of models and algorithms for social influence analysis. In *Social network data analytics* (pp. 177–214). New York: Springer.
- Taboada, M., Brooke, J., Tofiloski, M., Voll, K., & Stede, M. (2011). Lexicon-based methods for sentiment analysis. *Computational linguistics*, 37(2), 267–307.
- Werthner, H., Alzua-Sorzabal, A., Cantoni, L., Dickinger, A., Gretzel, U., Jannach, D., et al. (2015). Future research issues in IT and tourism. *Information Technology & Tourism*, 15(1), 1–15.
- Zhang, J., Ackerman, M. S., & Adamic, L. (2007). Expertise networks in online communities: structure and algorithms. In *Proceedings of the 16th WWW Conference*. New York: ACM.

**Part VI**  
**Augmented Reality and Virtual Reality**

# Augmented Reality at Cultural Heritage sites

Frances Tscheu and Dimitrios Buhalis

**Abstract** The heritage industry often seeks new ways to attract and engage new visitors. However, managers of Cultural Heritage sites face a lack in marketing and competitiveness. One of the ways to obtain competitive advantage is the investment and implementation of Augmented Reality on-site. This study investigates how value is created by this new and cutting-edge technology and provides a practical guide for enhancing customer value. An increased understanding of the topic should result in a growing adaption. Although there is research in the field of Augmented Reality and Cultural Heritage, the papers focus only on certain factors of value creation. The purpose of this study was however to provide a holistic overview of the whole value creation process. This represents a completely new area of research and opens a wide range of further research opportunities.

**Keywords** Augmented Reality • Cultural Heritage sites • Value creation • Service-dominant logic • Co-creation experience

## 1 Introduction

In the beginning of the twenty-first century, new adaptive and interactive technologies emerged, changing the tourism industry and sub-sectors completely (Buhalis & Law, 2008). Information and Communication Technologies (ICT), if used in a proper way, can provide enormous opportunities for urban and rural areas (Mariani, Baggio, Buhalis, & Longhi, 2014). The development of ICT in the Cultural Heritage (CH) sector shows this huge impact. Advances in computer technologies have led to a modification of several procedures, methods and applications (Owen, Buhalis, & Pletinckx, 2004). ICT changed the way analysing ancient places of CH was conducted (Brogni, Avizzano, Evangelista, & Bergamasco, 1999). Besides entailing benefits for the supply side, visitors of CH sites took advantage of ICT to enhance their CH experience. Audio tour guides (e.g. Gebbensleben, Dittmann, & Vielhauer, 2006), mobile device-based tour guides (e.g. Bellotti, Berta, De Gloria, & Margaroni, 2002) or virtual museums (e.g. Jacobson & Vadnal, 2005)

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changed the experience of a CH site completely. Although the heritage industry often seeks new ways to attract and engage new visitors, managers of CH sites face great challenges (Richards, 2007). A lack in marketing and competitiveness constitutes one of the main issues (Buhalis, 2000). As Jung and Han (2014, p.1) claim: “One of the ways for destinations to obtain competitive advantage is the investment and implementation of new technology”. As Augmented Reality (AR) is one of the most promising and cutting-edge technologies of modern times, its development and implementation in CH might be an opportunity for increasing competitiveness (Attila & Edit, 2012; Jung & Han, 2014).

Since AR is regarded as a tool for gaining a competitive advantage in the CH sector, it is questionable how this advantage is generated. What benefits exactly emerge through AR at CH sites? What stakeholder requirements exist? What needs to be considered in the development process? Knowledge of these aspects, which are important for understanding the value creation process and eventually the source of competitive advantage, is crucial. Only with the knowledge of how and where value is created can developers and providers create and implement a successful solution. However, an exploration of the topic has not been found in the literature yet. This is why this study aims to investigate how value is created by AR in CH sites and provides a practical guide for enhancing customer value.

## 2 Theoretical Background

### 2.1 *Value Creation in a Service Environment*

While traditional models of value creation claim that the producer creates value and exchanges with the consumer in the market (e.g. Levitt, 1960), the Service-dominant logic (SDL) views value creation as co-created by multiple stakeholders (Vargo & Lusch, 2004). All actors jointly integrate their resources in the process and thus create value, “the core purpose and central process of economic exchange” (Vargo, Maglio, & Akaka, 2008, p.145), together. This process orientation of value creation, in contrast to the output orientation, emphasizes how several actors exchange service simultaneously during a service provision. This service-for-service exchange takes place for the benefit of each other (Chandler & Vargo, 2011). As Akaka and Vargo (2013, p.370) suggest, the “service-centred view of SDL provides a broader and more encompassing view for studying value creation and thus innovation”.

Similar to the paradigm shift from Goods-dominant logic to SDL, the view on the creation of experiences changed from being created by the producer and forwarded to the consumer to a process of co-creation by both sides (e.g. Prahalad & Ramaswamy, 2004). This is due to consumers being increasingly more connected, informed and educated (Neuhofer, Buhalis, & Ladkin, 2013). Empowered consumers want to play an active role in the market place and therefore

determine value and their own experiences (Neuhofer et al., 2013; Prahalad & Ramaswamy, 2004). According to Neuhofer, Buhalis, and Ladkin (2012), who explored technology as a source of innovation to co-create enhanced destination experiences, consumers play an active role in co-creating their own experiences and technology is increasingly mediating those experiences. The researchers suggest that experience co-creation can reach new levels through the utilisation of technology. An integration of ICT combined with an active role of the customer results in enhanced experiences and an increase in value (Neuhofer et al., 2012). As a constant growth of value for the tourist is the highest priority in experience creation, tourism organisations need to find new ways to progress (Neuhofer et al., 2013). As AR belongs to one of the most innovative and engaging technologies (Attila & Edit, 2012; Jung & Han, 2014), an argument can be made to suggest that it will drive the creation of high customer value and fully technology-empowered experiences (Neuhofer et al., 2013).

## ***2.2 Augmented Reality at Cultural Heritage Sites***

AR is “a technique that combines a live view in real-time with virtual computer-generated images, creating a real-time augmented experience of reality” (Kleef, Noltes, & Spoel, 2010, p.1). It is not a new concept, but improvements in hardware, bandwidth and technological capabilities, as well as the growing demand for mobile devices, have accelerated the development (Bernados & Casar, 2011; Johnson, 2012). AR is able to create new value at CH sites (Cranmer & Jung, 2014). Visitors can explore the unfamiliar surroundings in an enjoyable and thrilling way (Fritz, Susperreguu, & Linaza, 2005). This represents one of the most significant benefits from a supply perspective because an increasing amount of tourists are looking out for unique and memorable on-trip experiences (Yovcheva, Buhalis, & Gatzidis, 2013). Besides enjoyment, researchers argue that the interaction between visitor and AR systems contributes to a richer CH experience (e.g. Han, Leue, & Jung, 2014). This indicates an experience co-creation, i.e. user and provider jointly create a valued outcome (e.g. Vargo, Maglio, & Akaka, 2008; Neuhofer et al., 2013).

One reason why AR is considered to be a feasible technology, for the heritage sector, is that it is now possible to develop applications for consumer-level mobile technology (Rigby & Smith, 2013). Since 2010, an increasing amount of AR applications in the CH domain is recorded. While AR applications, such as ‘Time Traveler’, are developed for smartphone devices, ‘Past View’ offers the visitor an AR experience through smart glasses and therefore represents a realistic and practical response to the trend of wearables. However, as Jung and Han (2014) states, AR at CH sites needs further academic exploration in order to increase the number of successful case studies. AR can convert CH into something that people can utilize for discovering the CH site and experiencing it. This study sheds light on the transformation of a CH asset into a CH product, i.e. the value creation process by AR at CH sites.

### 3 Method

Primary research is particularly important for the area of AR at CH sites because there are only a few academic papers available in this subject area. Therefore, a collection of primary data was required, which helped to provide new data about how value is created and a practical guide for enhancing customer value. The qualitative approach seemed to be the most suitable research method, due to the fact that this study is aimed at obtaining various opinions and valuable responses for a much deeper understanding, rather than examining numbers. It provides insights that represent the basis for finding out how value is created and eventually giving managerial implications. One-on-one interviews have proved to be a valuable method because of its greater detail and the possibility to discuss more complex and timely engaging issues. They are furthermore better qualified than focus groups due to the ability to foster the relationship between both the interviewer and interviewee and thus elicit more genuine opinions (Wiid & Diggines, 2010). This was of great importance for this study because the identification of value creation required, among others, the specification of costs and probably confidential information for CH sites.

A non-probability sampling was chosen for this study as the providers, industry experts and developers of AR at CH sites were not selected randomly and only represent a small sample. With regard to the sampling technique, the purposive sampling was considered to be the best method because participants were selected based on criterion or purposive attributes (Mason, 2002). This enabled the researcher to explore and understand the central themes and questions of the sample unit with similar features (Bryman, 2012). Interviewees of the study were carefully chosen according to specific characteristics and their leading position within the industry. In order to get rich data from the supply perspective, providers, developers and industry experts were interviewed. Table 1 demonstrates further details.

The data collection of 11 interviews took place twofold: Firstly, via Skype with all of the providers and some of the experts between 25.05.15 and 30.06.15. Secondly, face-to-face interviews were held with AR developers as well as some of the experts at the Augmented Reality World Expo (ARWE) in Santa Clara, CA, between 08.06.15 and 10.06.15. Whereas the latter was recorded with the help of an Olympus voice recorder, Skype allowed the researcher to record the interview additionally with the help of a free video call recorder.

Within the course of this study, interviews were transcribed and field notes were taken in order to collect the main ideas of the participants. While listening, reading and reviewing the notes and collected material for each section, the researcher became familiarized with the content. Afterwards, data were coded, so themes/categories could be built. The coding process included the marking of sections, such as sentences, phrases or paragraphs, whereas these sections received names/labels. This provided a better overview and manageable sections.

**Table 1** Selection interviewees

Sampling Criteria	Company	Job role/Name	Data collection
Provides AR for CH site	Time Traveler	CEO, Robin von Hardenberg	Skype
	Past View Seville	CEO, Jorge Robles del Salto Innovation and Business Development, Arthur Clark	Skype
	Streetmuseum Londinium	Marketing manager, Vicky Lee	Skype
Develops AR solution	Wikitude	CMO, Andy Gstoll	AR World Expo
	DAQRI	CTO, Philip Lamb	AR World Expo
	Augmented Pixels	CEO, Vitaliy Goncharuk	AR World Expo
	Flairio	CEO, Bob Saffari	AR World Expo
	Cedar Media	CEO, Mark Celletti	AR World Expo
Represents industry expert for AR at CH sites	Visual dimension	CEO, Daniel Pletinckx	Skype
	ETT spa	New Media Consultant, Giovanni Landi	AR World Expo
	ETT solutions	Digital Project Manager, Valerio Rossi	Skype

Although the study did not include vulnerable or disabled groups, it involved an interaction with human participants as the primary source of data. A participant consent form provided the opportunity to receive a confirmation of the data usage, whereas a summary sheet informed the interviewees about the main points of the research project. The consent form is extremely important because it contains the consent for audio recording, which represents a crucial component for analysing the data and the consent for mentioning the participants’ name within the course of the study.

## 4 Value Creation Framework and Practical Guide

The complexity of the value creation process, by AR at CH sites, can be simplified by visually conceptualizing a value creation framework. The value creation framework, including the key findings of the study, gives a holistic overview of value

**Table 2** Key findings in relation to objectives

Objectives	Key findings
Objective 1: To identify the most important stakeholder requirements of AR at CH sites	Developer requirement: Profit Provider requirements: Reasonable costs, Accessible, Preservation/ Being sustainable, Robust User requirements: Easy-to-use, Personalisation
Objective 2: To explore outstanding factors in the product development process of AR at CH sites	–Continuously research (Co-creation of content, Feedback, Evaluation and Product optimization) –Drivers of value are Storytelling and Engagement/ Interaction –Co-creation of AR experience (B2B and C2C Co-creation; Degree of Co-creation depends on application type, i.e. SST mobile AR application/ Accompanied mobile AR application)
Objective 3: To investigate the benefits and costs of AR at CH sites for providers and users	Provider benefits: Differentiation, Enhancement attention span, Visualisation of complex things in scientific correctness, User data Provider costs: Monetary = Development/ Production, Research; Non-monetary = Getting it wrong, Responsibility, Theft User benefits: Education, Time Travelling, Understanding, Immersive User costs: Monetary = Purchase; Non-monetary = Safety, Time consuming, Limited functionality, Level of knowledge inadequate; Privacy, Embarrassing look

creation and provides a practical guide for enhancing customer value. In order to create it, a summary of the key themes in relation to the objectives is required. Table 2 illustrates a summary.

The findings can be divided into three stages, namely ‘Requirements’ (before), ‘On-going development process’ (during) and ‘Benefits/Costs of Providers & Users’ (after). The whole value creation process by AR at CH sites is driven by an integration of all actors.

#### **4.1 Stage One: ‘Requirements’ (Before)**

Earning profit represents the most important requirement of AR at CH sites from a developer’s perspective. Varying business models are currently available on the market. Due to limited budgets at CH sites, the study recommends a shared revenue



model, i.e. developers take over initial investments and revenue is shared by CH sites and developers.

More significant requirements were identified from a provider’s perspective. In contrast to developers, providers of AR at CH sites do not just aim to make profit but also to preserve the fragile environment and build an application, which is accessible for a large audience and is robust in terms of provided hardware. Reasonable costs represent the most important requirement, as a lack of finance often exists in CH sites. This supports the recommendation of entering a shared revenue model, which does not require any initial investments.

According to ETT solutions, particular attention must be paid to user requirements as their satisfaction takes up a central part in increasing customer value. The findings imply that ‘easy-to-use’ and a ‘personalisation’ feature should be taken into consideration. This user-centred firm-activity indicates a SDL orientation, where the customer plays as a co-creator or co-producer, which is a crucial component within the value creation process (Vargo & Lusch, 2004, 2008) of experiences (Neuhofer et al., 2013; Prahalad & Ramaswamy, 2004).

Requirements play a crucial role in the value creation process. If the stakeholder requirements cannot be met, the stakeholder does not perceive benefits and thus value cannot be created. In the beginning, all main stakeholder requirements must be considered at once as some requirements might contradict (e.g. user requirement ‘Personalisation’ evokes higher development costs and stays in contrast to the provider requirement ‘Reasonable costs’).

### 4.2 Stage Two: On-going Development Process (During)

The identification of the main stakeholder requirements represents the starting point of the product development process and thus the value creation process. The process is on-going and each actor fulfils its own tasks as demonstrated in Fig. 1.

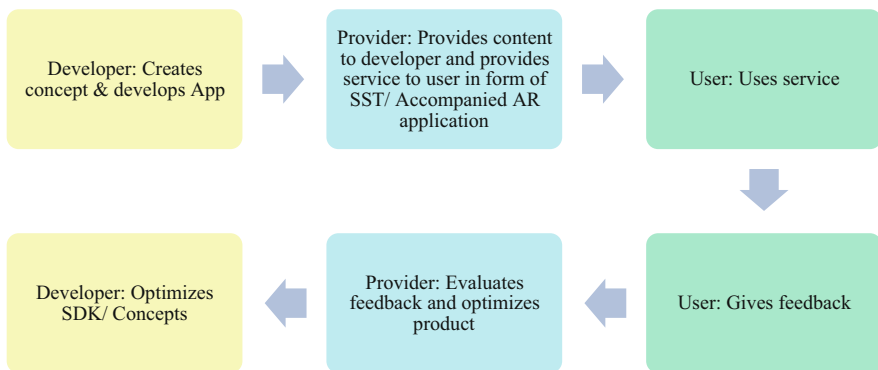


Fig. 1 Tasks actors in on-going development process

Besides concentrating on its own tasks, each actor needs to be aware that he/ she undergoes a special relationship. Developer and provider co-create the content of AR at CH sites. This study defines 'Co-creation of content', a new term which has not been found in the literature yet, as a management initiative that brings a variety of stakeholders (e.g. historians, archaeologists, architects, engineers and staff) together, in order to create a mutually valued content.

Provider and user co-create the experience. Self-Service Technology (SST) AR applications and Accompanied AR applications involve the user on a different level and provide a different experience. The researcher defines SST AR applications as applications, which the user operates completely by himself without any provided hardware and help of the provider on-site. Customers using Accompanied AR applications get support (e.g. in form of employees) and usually a hardware device from the provider. Developer and Provider must consider the type of application right in the beginning as the user feasibility belongs to a crucial factor for increasing customer value. While SST AR applications might need much more in-depth instructions in the application itself, Accompanied AR applications might have limited instructions in the application but require support by employees. These need to be trained.

Two aspects have been identified to drive the value within the product development process, namely Storytelling and Engagement/Interaction. Both are part of the entire value creation process because the Story/Interaction feature is made up within the initial content creation process; it is proposed by the provider and eventually co-created with the customer who uses the application. It is strongly recommended to integrate both features in the AR application. As the interviewee of Visual dimension stated, Storytelling can be implemented as 'Storytelling in a flow' (from station one to station two to station three and so on) or 'Storytelling at each station' (each station contains an own story irrespective of the others). A suitable type needs to be selected according to the degree of fascinating content (high degree = 'Storytelling in a flow') and the degree of user engagement (high degree targeted = 'Storytelling at each station' = Interactive Storytelling).

Engagement is the whole concept of co-creation (Jaakkola & Alexander, 2012). It has been found that the user plays an active role in the value creation process, i.e. he/she co-creates or even co-produces his/her own AR experience. Besides B2C Co-creation of AR experiences, an involvement of C2C Co-creation has been revealed. This demonstrates the increasing importance of the visitor who plays an active role and strives for empowerment. According to ETT solutions, a crowd sourced AR experience, i.e. a visitor-to-visitor-approach, could satiate this customer need on the highest level. As such an experience has not been developed specifically for the CH industry yet; a CH site could act as a pioneer and gain a

competitive advantage. AR serves therefore as a source of innovation to co-create enhanced CH experiences. However, the degree of engagement and therefore co-creation varies, depending on the type of application. SST AR applications require a higher user engagement, in comparison to Accompanied AR applications, as the user is left alone. SST AR applications are therefore regarded as technology-empowered experiences due to a higher level of engagement and technology (employee is replaced by technology), representing the highest stage in the Experience typology matrix of Neuhofer et al. (2013). Although the user is engaged on the highest level, higher monetary costs arise for providers and users. Each CH site needs to consider advantages and disadvantages of both application types and choose the most suitable.

### ***4.3 Stage Three: Benefits/Costs of Providers and Users (After)***

With the use of AR at CH sites, providers perceive benefits and costs. Value is however not created up to this point because the user, who stays in the centre of firm activity, has not used the service yet. The provider just proposes value to the user. Once the user utilises the service, value and eventually the experience are co-created by both parties. Providers need to keep user benefits high and the user costs low in order to maximize the customer value.

The research showed that CH sites see enormous benefits in AR. 'Being excellent, being different' belongs to one of the most important aspects for gaining a competitive advantage. Even though monetary costs are higher compared to other mobile applications, benefits outweigh costs. Hence, the proposed value is positive from a provider perspective.

An investigation of user benefits and costs resulted in an identification of educational advantages, a deeper understanding and benefits such as time travelling and an immersive experience. However, non-monetary user costs are still numerous. Aspects, such as safety risks, time management issues and an embarrassing appearance reduce the customer's perceived-value. Although AR represents a promising and cutting-edge technology, it is still in its infancy and technology issues might evoke a limited functionality from time to time. Developer and Provider therefore need to be aware of benefits and costs and try to increase benefits and minimize costs. Figure 2 illustrates the three stages building the value creation framework.

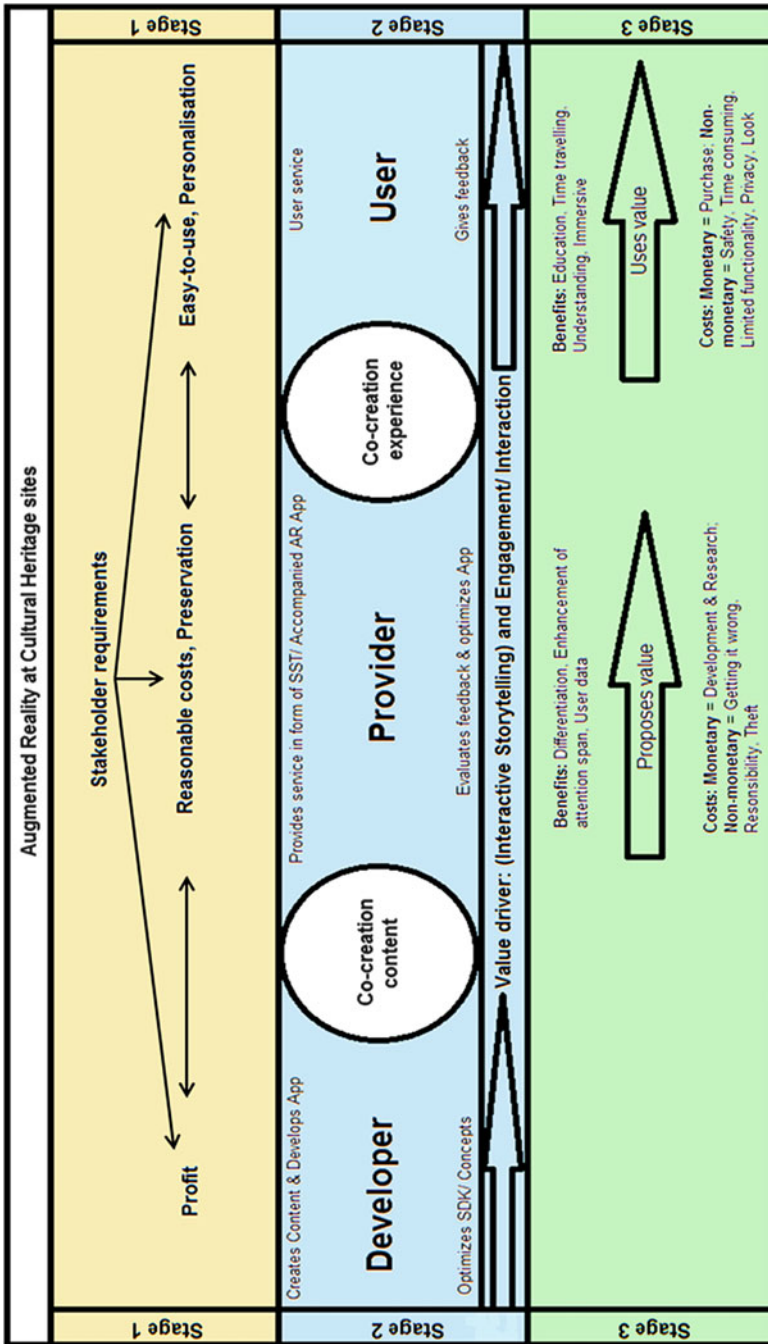


Fig. 2 Value creation framework

## 5 Conclusion

The findings of this study indicate that numerous factors influence the value creation process by AR at CH sites. A consideration of the main stakeholder requirements plays an important role in the initial development process. Diverse factors, such as the co-creation of the AR experience, make-up a central role in the product development process and value represents the outcome of benefits and costs. A description of these specific aspects was crucial for understanding the whole value creation process and delivering a practical guide for creating a competitive advantage and enhancing customer value.

The development and implementation of AR represents an opportunity for increasing the competitiveness. Industries, such as retail or manufacturing, have already recognized the potential. Successful examples in the heritage industry are few in addition to service availability on the market. The chances and capabilities for CH sites are not fully understood yet (Jung & Han, 2014). An investigation of the different stages of the value creation process by AR at CH sites and a visual illustration in form of a value creation framework shed light on the topic. The management of CH sites can see, at a glance, which requirements they have to focus on in the initial development process (before), which outstanding factors they have to consider in the product development process (during) and which benefits and costs occur for them as well as for the user (after).

Although there is research in the field of AR and CH, the papers focus only on certain factors of value creation. The purpose of this study was however to provide a holistic overview of the whole value creation process. This represents a completely new area of research and opens a wide range of further research opportunities for the academic community.

The fast development of AR might modify certain results of the study. For instance, user costs, such as an embarrassing appearance or privacy issues, may be limited in the future due to an increased adoption of AR applications by users. Hence, there is a need for additional studies in the next 5–10 years, investigating the same aspects of value creation by AR at CH sites and updating the value creation framework to ensure its future credibility. It is advisable to include further stakeholders, such as archaeologists and historians, so the needs and wants of more than three main stakeholders are considered. Also an investigation of value creation, especially requirements, benefits and costs, from a user perspective is highly recommended. These studies might confirm or contradict the results discovered from a supply perspective. Although the value creation framework was developed particularly for the purpose of CH sites, and all interviewees were related to the heritage industry, other tourist sites might use it as an indicator for implementing AR. However, it is recommendable to conduct own studies as the requirements, product development process or benefits and costs might differ.

Several limitations are acknowledged which could be addressed in further studies. Although the researcher could assure a broad perspective from the supply side, i.e. provider, developer and experts, the customer perspective was not taken

into consideration. This could have been mainly important for the description of data related to the benefits and costs. However, the supply side could provide these data as well, whereas further research from the customer side might reveal differences in perception.

Finally, the study explored the value creation for the whole industry, i.e. AR in the heritage industry, rather than for a single CH site. The value creation accounts as a key source for competitive advantage and might be slightly different for each CH site. The approach of this study might therefore seem somewhat vague. Nevertheless, this research project aimed to provide a holistic overview and practical guideline for enhancing customer value. Each provider could review the suggested guideline and adjust it accordingly.

## References

- Akaka, M. A., & Vargo, S. L. (2013). Technology as an operant resource in service (eco)systems. *Information Systems and e-Business Management*, 12(3), 367–384.
- Attila, K., & Edit, B. (2012). Beyond reality: The possibilities of augmented reality in cultural and heritage tourism. In: *2<sup>nd</sup> International Tourism and Sport Management Conference*, Debrecen 5–6 September 2012. Debrecen: University of Debrecen.
- Bellotti, F., Berta, R., De Gloria, A., & Margarone, M. (2002). User testing a hypermedia guide. *Pervasive Computing*, 1(2), 33–41.
- Bernados, A. M., & Casar, J. R. (2011). Analysing business models for mobile augmented reality. In: *15th International Conference on Intelligence in Next Generation Networks*, Berlin 4–7 October 2011. Madrid: Universidad Politécnica de Madrid.
- Brogni, A., Avizzano, C. A., Evangelista, C. & Bergamasco, M. (1999). *Technological Approach for Cultural Heritage: Augmented Reality* [online]. Pisa: Scuola Superiore S. Anna. Available from: [http://www0.cs.ucl.ac.uk/staff/ucacaxb/publicdownload/1999\\_Brogni\\_TAF.pdf](http://www0.cs.ucl.ac.uk/staff/ucacaxb/publicdownload/1999_Brogni_TAF.pdf) [Accessed 30 May 2015].
- Bryman, A. (2012). *Social research method* (4th ed.). Oxford: Oxford University Press.
- Buhalis, D. (2000). Marketing the competitive destination of the future. *Tourism Management*, 21(1), 97–116.
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management*, 29(4), 609–623.
- Chandler, J. D., & Vargo, S. L. (2011). Contextualization and value-in-context: How context frames change. *Marketing Theory*, 11(1), 35–49.
- Cranmer, E., & Jung, T. (2014). Augmented reality (AR): Business models in urban cultural heritage tourist destinations. In: *APacCHRIE Conference*, Malaysia 21–24 May 2014. Manchester: Manchester Metropolitan University.
- Fritz, F., Susperregu, A., & Linaza, M. (2005). Enhancing cultural tourism experiences with augmented reality technologies. In: M. Mudge, N. Ryan, and R. Scopigno (Eds.), *The 6th International Symposium on Virtual Reality, Archaeology and Cultural Heritage*, Pisa November 2005. San Sebastian: Asociación VICOMTech.
- Gebbensleben, S., Dittmann, J., & Vielhauer, C. (2006). Multimodal audio guide for museums and exhibitions [online]. In: *Proceedings of SPIE Electronic Imaging – Multimedia on Mobile Devices II*, Bellingham, Washington, February 2006. Bellingham: SPIE.

- Han, D., Leue, C., & Jung, T. (2014). A tourist experience model for augmented reality applications in the urban heritage context. In *APacCHRIE Conference, 21–24 May 2014 Kuala Lumpur*. Manchester: Manchester Metropolitan University.
- Jaakkola, E., & Alexander, M. (2012). The role of customer engagement behavior in value co-creation—A service system perspective. *Journal of Service Research*, 17(3), 247–261.
- Jacobson, J., & Vadnal, J. (2005). The Virtual Pompeii Project. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare and Higher Education, Vancouver 24–28 October 2005*. Chesapeake: AACE.
- Johnson, M. (2012). *Business consulting: What you need to know for IT Operations Management*. Newstead, Australia: Emereo Publishing.
- Jung, T., & Han, D. (2014). *Augmented reality (AR) in urban heritage tourism—eReview of tourism research*. Manchester: Manchester Metropolitan University.
- Kleef, N., Noltes, J., & Spoel, S. (2010). *Success factors for augmented reality business models*. Enschede: University Twente.
- Levitt, T. (1960). Marketing Myopia. *Harvard Business Review*, 38 (July–August), 26–44.
- Mariani, M. M., Baggio, R., Buhalis, D., & Longhi, C. (2014). *Tourism management, marketing and development (The Importance of Networks and ICTs, Vol. 1)*. New York: Palgrave MacMillan.
- Mason, J. (2002). *Qualitative researching* (2nd ed.). London: Sage.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2012). Conceptualising technology enhanced destination experiences. *Journal of Destination Marketing and Management*, 1(1–2), 36–46.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2013). A typology of technology-enhanced tourism experiences. *International Journal of Tourism Research*, 16(4), 340–350.
- Owen, R., Buhalis, D., & Pletinckx, D. (2004). Identifying technologies used in Cultural Heritage. In: Y. Chrysanthou, K. Cain, Silberman and F. Niccolucci (Eds.), *The 5th International Symposium on Virtual Reality, Archaeology and Cultural Heritage VAST 2004*. Oudenaarde 7–10 December 2004. Geneve: Eurographics Association.
- Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5–14.
- Richards, G. (2007). *Cultural tourism: Global and local perspectives*. New York: Routledge.
- Rigby, J., & Smith, S. P. (2013). *Augmented reality challenges for cultural heritage*. Newcastle: Applied Informatics Research Group University of Newcastle.
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1–17.
- Vargo, S. L., & Lusch, R. F. (2008). From good to service(s): Divergences and convergences of logics. *Industrial Marketing Management*, 37(3), 254–259.
- Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26(3), 145–152.
- Wiid, J., & Diggines, C. (2010). *Marketing research*. Cape Town: Juta and Company Ltd.
- Yovcheva, Z., Buhalis, D., & Gatzidis, C. (2013). Engineering augmented reality tourism experiences. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism 2015*. Vienna: Springer International Publishing.

# Effects of Virtual Reality and Augmented Reality on Visitor Experiences in Museum

Timothy Jung, M. Claudia tom Dieck, Hyunae Lee, and Namho Chung

**Abstract** This study aims to investigate the impact of Virtual Reality (VR) and Augmented Reality (AR) on the overall visitor experience in the context of museum. In tourism research, few attempts have been made to examine factors which enhance visitor experience using new and emerging technologies such as VR & AR respectively, however research on visitor experience in the mixed environment by combining both VR & AR is scarce. In particular, this study examined the impact of social presence on visitor experience in the mixed (VR & AR) environment by applying social presence theory and experience economy theory. Questionnaires administered to 163 museum visitors revealed that social presence in mixed (VR & AR) environments is a strong predictor of four realms of experience economy. Furthermore, all aspects of experience economy, except for esthetic experience, have a significant influence on visitor experience, which consequently induce the tourists' intention to revisit Geevor museum. The results of this study provide theoretical and managerial implications for adoption of VR & AR technologies in museum.

**Keywords** Virtual reality • Augmented reality • Visitor experience • Experience economy • Social presence • Users' intention to revisit museum

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## 1 Introduction

Many cultural tourism organisations tried to use Augmented Reality (AR) and Virtual Reality (VR) to enhance the visitor experience (Jung, Chung, & Leue, 2015). Particularly AR started to be picked up by tourism practitioners as a tool for the provision of tourism information and creation of an enjoyable and interactive tourism experience as examples such as Dublin AR (Han et al., 2013), AR at Deoksugung palace in South Korea (Lee, Chung, & Koo, 2015) or Manchester Art Gallery (Leue, Jung, & tom Dieck, 2015) show. VR has a number of implementations within the tourism context, according to Guttentag (2010), ranging from planning and management, marketing, entertainment and education to the preserving of history and accessibility of tourism attractions and destinations. However, in tourism research, little attempts have been made to examine factors enhancing visitor experience using both AR and VR technologies.

Social presence is referred to “the extent to which other beings (living or synthetic) also exist in the virtual environment” (Schuemie, Van Der Straaten, Krijn, & Van Der Mast, 2001, p. 184) and it is considered as one of the key factors which influences on experiences. The role of social presence was previously investigated focusing on the VR environment and with an increase in importance of VR & AR within the tourism context, tourists are increasingly immersed in the real and virtual environment. Thus, social presence is gaining importance in the tourism context (Lee, 2002). According to Kang and Gretzel (2012), the less tourists perceive their experience to be artificial or mediated, the more strongly social presence occurs. While most studies about social presence have focused on the VR environment, only limited studies focused on the roles of social presence in the context of AR environment or in the mixed (VR & AR) environment. Therefore, the aim of this paper is to examine whether the visitor’s overall experience could be enhanced by social presence in the mixed (VR & AR) environment and further inducing revisit intention to visitor attraction.

## 2 Theoretical Background

### 2.1 *Augmented Reality and Virtual Reality*

The potential of AR to enhance immediate surroundings through the projection of digital content into users’ real environment has been discussed in various research contexts (Jung, Kim, & Kim, 2013). For the tourism industry, an increasing number of scholars recognise the potential of AR for the enhancement of the tourism experience (Jung et al., 2015; Dieck, M. C & Jung, 2015). Through the use of marker or location-based AR applications, tourists are able to receive instant information on unknown surroundings (Han, Jung, & Gibson, 2013). Especially for cultural heritage sites, AR allows for the provision of digital signage and content

without compromising on the original architecture or landscape (Han et al., 2013). Furthermore, Leue et al. (2015) revealed that the availability of enjoyable and engaging AR applications can contribute to a tourism learning experience.

In contrast to VR, AR allows tourists to naturally experience attractions and destinations with the enhancement of overlaid digital content (Jung et al., 2015). VR is the full immersion in a digital created environment (Guttentag, 2010). Guerra, Pinto, and Beato (2015, p. 50) suggested that the “difference between augmented reality and virtual reality is that the first digital information is added to images and real-life contexts, while the second offers the user a new world in which he is immersed allowing, for example, to fly over a city without taking his feet off the ground”. With the development of highly powerful, low-cost and user-friendly VR devices such as Samsung Gear or Oculus Rift, use cases and prototype application are starting to become publically and commercially available. Hotel companies such as Marriott recognised the opportunity to show potential customers destinations and hotel facilities to decrease uncertainty and facilitate the booking decision (Marriott, 2014). In addition, VR offers the opportunity to tourists to visit endangered sites as a substitute to the real visitation in order to sustain heritage attractions and destinations for generations to come (Guttentag, 2010). Likewise, difficult-accessible sites can be made available to tourists using VR. According to Guerra et al. (2015), AR and VR are two technologies that open new opportunities for the tourism industry and academia and industry needs to identify and exploit these new technological possibilities. However, research investigating mixed-reality, both AR and VR, is scarce and therefore, future research is needed to understand the full potential of AR and VR in the tourism and visitor attraction context.

## 2.2 *Social Presence Theory*

Presence is defined as “the sense of being in an environments” (Steuer, Biocca, & Levy, 1995) and has been regarded as a crucial component for improving performance of medium by providing users with experience of “being there” (Steuer et al., 1995). Presence is multidisciplinary concept and numerous researchers have tried to define or classify it. Heeter (1992) classified presence into three types: personal, social and environmental presence. Among them, social presence has been treated as a crucial component of technology experience (Kang & Gretzel, 2012; Schuemie et al., 2001).

According to social presence theory posited by Short, Williams, and Christie (1976), the amount of social cues allowed in media are able to increase the degree of social presence. In other words, social presence defined as “the extent to which other beings (living or synthetic) also exist in the virtual environment” (Schuemie et al., 2001, p. 184). With technology advance, numerous information systems used in tourism destinations (e.g. VR & AR) have increasingly provided tourists with more real and immersive virtual environments, which conveys strong social

presence (Lee, 2002). In other words, the less technology users perceive artificial or mediated experience, the more strongly social presence occurs (Kang & Gretzel, 2012; Lee, 2002). Therefore, it is natural that social presence has been actively investigated in the context of virtual environment provided by information communication technologies (e.g. Kang & Gretzel, 2012; Lee, Lee, & Ham, 2013; Schuemie et al., 2001). Kang and Gretzel (2012) investigated the impact of social characteristic of podcast on social presence and tourists' experience. The results showed that social presence ultimately influences on tourists' experience. Lee et al. (2013) examined the impact of social presence in smartphone applications on tourists' experience (educational, entertainment and escape) and satisfaction. However, in the context of AR, little has been done to study the roles of social presence. In contrary to VR providing complete virtual environment, AR provides virtual images that superimposed on the real world view captured from the camera of device (Kounavis, Kasimati, & Zamani, 2012), thus, social presence in AR environments can be different from that in VR environments. Therefore, this study extended research territory to the AR environment by including both social presence in VR & AR environments.

### 2.3 *Experience Economy*

The paradigm of tourism business have been shifted from focusing the product or service itself to enhancing tourists' experience and making it memorable (Oh, Fiore, & Jeoung, 2007; Pine & Gilmore, 1998). A tourist's life is filled with mixed experiences which are not simply classified bad or good (Löfgren, 2008). According to previous literature (e.g. Kang & Gretzel, 2012; Urry, 2002), tourists' experiences have socially and culturally originate in various sensescapes. Recently, numerous technologies also have been found to play important roles of enriching a tourist's experience by facilitating interactions between the tourists and the destination (Kang & Gretzel, 2012). The attempts to extend a tourist's experience to technology-originated by investigating mixed experience of VR & AR is needed.

Pine and Gilmore (1998)'s experience economy has been regarded as a predominant concept in experience area. Pine and Gilmore (1998) insisted the importance of 'stage experience', which is core product of tourism industry (Sternberg, 1997), and classified 'staged experience' into four realms of experience economy by two spectrums of participation (passive and active participation) and connection (absorption and immersion): entertainment, education, esthetic, and escape experience.

In an education experience, tourists tend to participate in activities in tourism destination in order to increase their skills and knowledge (Oh et al., 2007). For instance, tourists are able to acquire information and knowledge about destination by using VR or AR. In this vein, numerous studies have focused on the role of VR from the education perspective (e.g. Mintz, Litvak, & Yair, 2001). In entertainment experience, the most prevalent concept of today's tourism environments (Pine &

Gilmore, 1999), tourists are able to enjoy activities in destination for pleasure. Enjoyment experience has been regarded as a crucial component of hedonic information system adoption (e.g. Van der Heijden, 2004). Finally, esthetic and escapist experience have a feature of immersion, which is defined as “becoming physically or virtually a part of the experience itself” (Pine & Gilmore, 1999, p. 31). In this vein, esthetic and escapist experience have been actively investigated by numerous research about VR (e.g. Marković, 2010) and AR (e.g. Lee, Chung, & Jung, 2015; Lee, Chung & Koo, 2015). In these experiences, tourists are able to be immersed in VR’s virtual world or AR’s virtually enhanced real world (Di Serio, Ibáñez, & Kloos, 2013). In other words, well-designed VR & AR’s environments enable tourists to perceive authenticity (Guttentag, 2010), or to enjoy from their tedious routine lives (Urry, 2002).

### 3 Research Model and Hypotheses Development

This study mainly investigates the relationship between social presence on the visitor experience through VR & AR mixed experience. Taking into consideration the previous literature, we conceptualize the research model of this study in Fig. 1.

#### 3.1 Social Presence and Experience Economy

The importance of social presence on the IS (Information System) learning, education and escape experience in the tourism context has been thoroughly investigated by Kang and Gretzel (2012). In addition, esthetics and entertainment are considered important dimensions of the experience economy (Mehmetoglu &

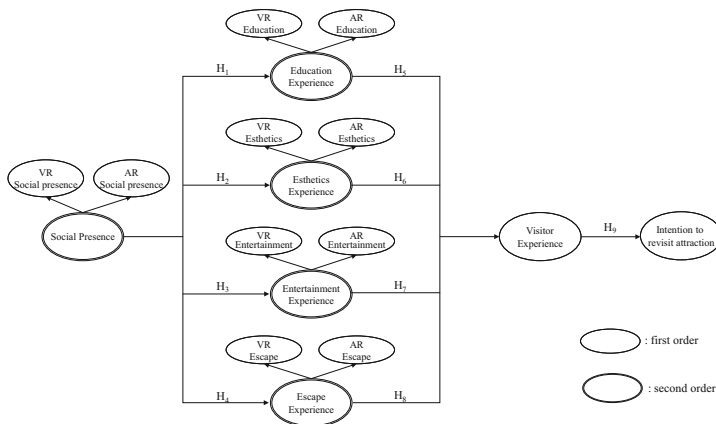


Fig. 1 Proposed research model

Engen, 2011; Oh et al., 2007; Pine & Gilmore, 1998) and esthetics was found to influence AR acceptance (Lee, Chung & Jung, 2015). Integrating the AR and VR experience in all dimensions, the following hypotheses are proposed:

- H<sub>1</sub>: Social presence has a positive impact on education experience
- H<sub>2</sub>: Social presence has a positive impact on esthetic experience
- H<sub>3</sub>: Social presence has a positive impact on entertainment experience
- H<sub>4</sub>: Social presence has a positive impact on escape experience

### ***3.2 Experience Economy and Visitor Experience***

According to Pine and Gilmore (1998), the four realms of experience are essential components for developing memorable experiences. Particularly in the tourism context, staging of educational, entertaining, esthetic and escaping experiences are considered important for satisfying vacations (Morgan, Elbe, & de Esteban Curiel, 2009). In addition, VR & AR are technologies that facilitate learning and entertainment (Leue et al., 2015), offer esthetics (Lee, Chung & Jung, 2015) and contribute to the escaping of reality (Jung et al., 2015) and therefore, the following hypotheses are proposed:

- H<sub>5</sub>: Education experience has a positive impact on visitor experience
- H<sub>6</sub>: Esthetic experience has a positive impact on visitor experience
- H<sub>7</sub>: Entertainment experience has a positive impact on visitor experience
- H<sub>8</sub>: Escape experience has a positive impact on visitor experience

### ***3.3 Visitor Experience and Intention to Revisit Visitor Attraction***

The strong effect of experience towards behavioural intentions has been well proven within previous research (Keng, Huang, Zheng, & Hsu, 2007). According to Hosany and Witham (2010), also in the tourism context, a well-staged experience leads to satisfied customers and intentions to re-visit which is particularly important in the intangible tourism industry and thus, the following hypothesis is proposed:

- H<sub>9</sub>: Visitor experience has a positive impact on intention to revisit the visitor attraction

## 4 Methods

### 4.1 Data Collection

Geevor Tin Mine Museum is a UNESCO World Heritage Site in Cornwall, UK. Geevor was chosen as an example for its unique visitor offering and its aim to engage more in latest technologies to enhance the visitor experience. The museum has earned international recognition as a museum and heritage centre due to its fundamental role in mining. The data was collected at Geevor Tin Mine Museum from 15th to 16th of July 2015. Every visitor visiting the museum during the days of experiments was asked to participate in the research and 163 agreed to participate. The reason to approach every visitor is due to small visitor numbers. As part of the experiment, participants tried the Geevor AR application which provided overlaid text, video and audio as well as 3D animations and avatars to further explain the museum and aspects of its history. In addition, participants tried a Samsung Gear VR application which allowed them to experience the lift ride down the mining shaft to re-enact how miners originally started their work. As the lift is currently not accessible to visitors, this experience was unique for those using VR. Therefore, VR can be regarded as not only a substitute for tourism experience but also a useful tool for enhancing tourists' experience. After visiting the museum using AR and VR, the 163 participants completed a questionnaire. According to Gefen, Straub, and Boudreau (2000), a minimal sample size is required to outnumber ten times the number of items in the most complex construct in order use PLS. In our study, the most complex constructs have four items, thus, our sample size should outnumber 40. Therefore, our sample size (163) is well above this minimum.

More than half of the respondents were male (94, 57.7 %), and rest of them were female (69, 42.3 %). Out of the total respondents, 49 (30.1 %) respondents were between 45 and 54, 39 (23.9 %) were between 35 and 44, 26 (16.0 %) were between 55 and 64. About half of respondents were full-time employees (77, 47.2 %) and UK tourists (92, 56.4 %) accompanying with family and friends (105, 64.4 %).

### 4.2 Measures

Measurement items of this study were adopted from previous literature (Table 1). Social presence and 4Es experiences were measured as first-order constructs which have reflective measurements of VR & AR. This procedure yields 47 items which are summarized by each construct (Table 1). All items were rated from 1 (strongly disagree) to 7 (strongly agree) by using 7-point-likert scale.

**Table 1** Measurement model

Constructs and measurement			Mean	S.D	C.R	Alpha	AVE
EDU	VR	I learned something new during VR use	5.95	0.81	0.883	0.823	0.654
		The experience made me more knowledgeable					
		It stimulated my curiosity to learn new things					
		VR provided a good experience for learning					
	AR	I learned something new using AR	6.01	0.84	0.930	0.899	0.769
		The experience has made me more knowledgeable					
		It stimulated my curiosity to learn new things					
		AR provided a good experience for learning					
EST	VR	Using VR was very attractive	5.79	0.86	0.848	0.718	0.651
		VR demo played close attention to detail					
		Using VR was very pleasant					
	AR	Using AR was very attractive	5.70	0.99	0.923	0.874	0.799
		The setting of AR paid close attention to details					
		Using AR was very pleasant.					
ENT	VR	Using VR was amusing	6.10	0.92	0.936	0.903	0.786
		Using VR was captivating					
		Using VR was entertaining					
		Using VR was fun					
	AR	Using AR was amusing	5.51	1.09	0.942	0.916	0.802
		Using AR was captivating					
		Using AR was entertaining					
		Using AR was fun					
ESC	VR	I felt I played a different character when using VR	4.95	1.29	0.923	0.887	0.749
		I felt like I was living in a different time or place					
		The VR experience let me imagine being someone else					
		I completely escaped from reality					
	AR	I felt I played a different character when using AR	3.84	1.46	0.966	0.952	0.876
		I felt like I was living in a different time or place.					
		The AR experience let me imagine being someone else					
		I completely escaped from reality					

(continued)

**Table 1** (continued)

Constructs and measurement			Mean	S.D	C.R	Alpha	AVE
SCP	VR	There is a sense of human contact in VR	4.33	1.27	0.946	0.914	0.853
		There is a sense of sociability in VR					
		There is a sense of human warmth in VR					
	AR	There is a sense of human contact in AR	4.73	1.46	0.965	0.945	0.902
		There is a sense of sociability in AR					
		There is a sense of human warmth in AR					
EXP	Using VR & AR contributed positively to my overall visitor experience.		5.79	0.99	0.959	0.935	0.886
	Using VR & AR helped me to enjoy my travel.						
	Using VR & AR assisted me in gaining a meaningful visitor experience.						
VST	I will visit Geevor again after experiencing VR & AR		4.55	1.18	0.917	0.881	0.738
	I intend to visit Geevor frequently after experiencing VR & AR						
	I will continue to visit Geevor in the future after experiencing VR & AR						
	I want to recommend Geevor to others after experiencing VR & AR						

Note: *EDU* Education experience, *EST* Esthetics experience, *ENT* Entertainment experience, *ESC* Escape experience, *SCP* Social presence, *EXP* Visitor experience, *VST* Intention to revisit attraction

## 5 Analysis and Results

### 5.1 Measurement Model

In order to test the proposed research model (Fig. 2), we used a partial least squares (PLS) regression analysis, using PLS-Graph version 3.0. According to, PLS regression analysis has several advantages such as small sample size, and a few assumptions about measurement scale and normal distribution. With PLS-Graph, the analyses were implemented by taking two steps: measurement model analysis and structural equation modelling (SEM).

Chin (1998) suggested that before conducting the SEM, reflective constructs should be validated through composite reliability, Cronbach’s alpha and AVE (Average Variance Extracted). To be more specific, composite reliabilities and Cronbach’s alphas are required to be greater than the threshold value of 0.7, and AVEs are required to exceed threshold value of 0.5. Moreover, square roots of AVE for each constructs are required to exceed correlation between that construct and other constructs (Fornell & Larcker, 1981). These procedures establish composite





**Fig. 2** Snapshot of VR & AR experience in Geevor Tin Mine Museum

reliability and discriminant/convergent validity of each constructs. It was found that composite reliabilities, Cronbach's alphas, and AVEs of each constructs satisfied the requirements (Table 1).

Furthermore, we examined the relationships between the latent variables and their corresponding constructs by checking cross-loadings. And all items have high loadings and cross-loadings on their corresponding constructs. Moreover, as shown in Table 2, the diagonal elements in boldface in the "correlation of constructs" matrix are the square root of the average variance extracted (AVE). For adequate discriminant validity, the diagonal elements should be greater than the corresponding off-diagonal elements. Based on these procedures, reliability and convergent/discriminant validity of our measurement model were established.

## 5.2 Structural Model

Structural equation modelling was conducted in order to assess hypothesized relationships. The size of bootstrapping was 500. The results were shown in Fig. 3.

Social presence was found to have strong influence on all of the 4Es: education ( $\beta = 0.552$ ,  $t = 9.429$ ,  $p < 0.001$ ), esthetic ( $\beta = 0.626$ ,  $t = 12.487$ ,  $p < 0.001$ ), entertainment ( $\beta = 0.604$ ,  $t = 11.496$ ,  $p < 0.001$ ) and escape experience ( $\beta = 0.690$ ,  $t = 16.321$ ,  $p < 0.001$ ), thus, the hypotheses  $H_1$  to  $H_4$  were supported. Education ( $\beta = 0.302$ ,  $t = 3.412$ ,  $p < 0.001$ ), entertainment ( $\beta = 0.452$ ,  $t = 5.036$ ,  $p < 0.001$ ) and escape experience ( $\beta = 0.096$ ,  $t = 1.842$ ,  $p < 0.1$ ) were found to have impact on visitor experience, and especially entertainment showed the strongest impact. Therefore, Hypotheses  $H_5$ ,  $H_7$  and  $H_8$  were supported. In contrast, esthetic experience was not found to have a significant influence on visitor experience ( $\beta = 0.085$ ,  $t = 0.918$ , n.s), thus, Hypothesis  $H_6$  was not supported.

**Table 2** Correlations among constructs

Construct	Correlations												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
(1) VR_EDU	<b>0.809</b>												
(2) AR_EDU	0.689	<b>0.877</b>											
(3) VR_EST	0.680	0.549	<b>0.807</b>										
(4) AR_EST	0.605	0.740	0.586	<b>0.894</b>									
(5) VR_ENT	0.545	0.568	0.699	0.558	<b>0.887</b>								
(6) AR_ENT	0.565	0.673	0.532	0.777	0.603	<b>0.896</b>							
(7) VR_ESC	0.539	0.493	0.555	0.484	0.519	0.424	<b>0.865</b>						
(8) AR_ESC	0.403	0.358	0.384	0.428	0.282	0.510	0.601	<b>0.936</b>					
(9) VR_SCP	0.489	0.425	0.541	0.477	0.449	0.457	0.570	0.634	<b>0.924</b>				
(10) AR_SCP	0.380	0.471	0.411	0.518	0.426	0.539	0.438	0.498	0.514	<b>0.950</b>			
(11) EXP	0.663	0.701	0.676	0.657	0.727	0.687	0.528	0.461	0.538	0.474	<b>0.941</b>		
(12) VST	0.521	0.492	0.480	0.532	0.524	0.587	0.481	0.478	0.509	0.403	0.566	<b>0.855</b>	

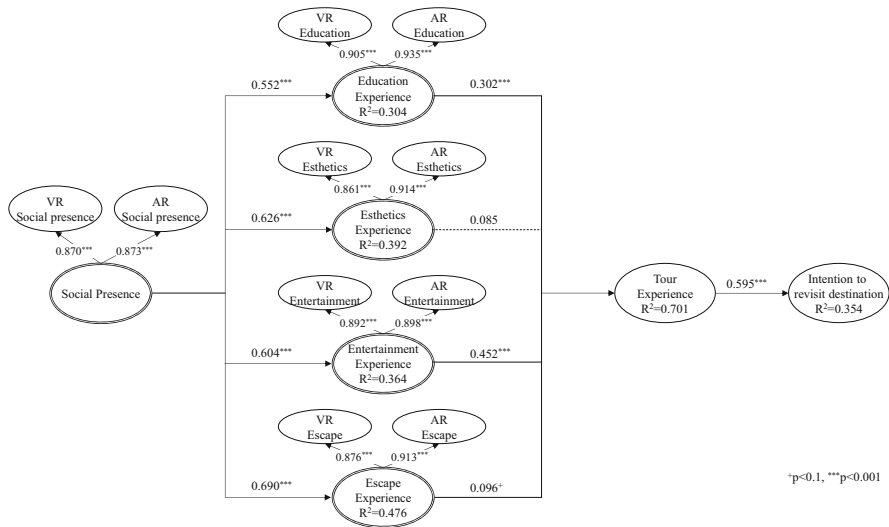


Fig. 3 Path estimates by PLS analysis

## 6 Discussion and Conclusion

The results showed that social presence in mixed (VR & AR) environments is a strong predictor of four realms of experience economy. This result is partially similar with Kang and Gretzel (2012)’ study which showed strong relationships between social presence and experiences (e.g. enjoyment and escape experiences). Moreover, except for esthetic experience, all of experience economy have significant influence on visitor experience, which consequently induce tourists’ intention to revisit visitor attraction. Especially, entertainment experience was found to be the strongest predictor of tourist experience. This phenomenon can be explained by carry-over effect which means that pleasure or arousal evoked from an initial experience continues in subsequent experience (Menon & Kahn, 2002). In our context, entertainment experience from VR and AR can lead to enhanced overall tourist experience.

Based on these results, the present study provides theoretical and practical implications. One of the theoretical implications is that we extended the territory of social presence research to AR environments. While numerous studies have focused on social presence in VR environments, little study has been done in the context of AR environments. However, because AR plays an important role of enhancing tourist’s social awareness and experience as well as historical and geological knowledge (Jung et al., 2015), it is meaningful to broaden the research territory of social presence to AR environments. Moreover, the present study tried to investigate whether individual’s experience enhanced by technologies such as VR and AR can contribute to improving overall tourist experience and even

inducing intention to revisit tourism destination. Since only a small number of studies (e.g. Kang & Gretzel, 2012) have put emphasis on the role of enhanced experience by technologies in inducing visitors to return to physical destination, this study can be regarded as worthwhile. Further, while VR can be regarded as just a substitute for tourism experience, the present study consider both VR and AR as a useful tool for enhancing tourists' experience which can ultimately induce intention to visit actual destination. Finally, the results of the present study provide VR and AR developers, tourism institutions and organizations with practical implications. In order to enrich tourists' experience and ultimately attract them to revisiting the destinations, it is required to have more focus on tourists' social presence and experience in VR and AR environments. To be more specific, by offering high quality of resolution or sound, more authentic VR and AR environments in which tourists can be fully immersed should be provided. Moreover, they should consider providing captivating factors such as avatars and 3D animations in order to enhance tourists' entertainment experience which are crucial factors of the tourists' overall experience and intention to revisit destination.

However, the present study has some limitations. First of all, we conducted the experiment with participants who were asked to use both VR and AR. Therefore, it is possible that the design and functional differences between VR and AR were ignored. Although we focused mixed experience of VR and AR, it can be also meaningful to investigate tourists' social presence and experience in VR and AR environments separately. Second, although experience economy of Pine and Gilmore (1998) has been regarded as an eminent theoretical framework, other factors (e.g. technological, demographical, perceptual, and so forth) to influence or be influenced by social presence also should be investigated.

## References

- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, 295(2), 295–336.
- Dieck, M. C., & Jung, T. (2015). A theoretical model of mobile augmented reality acceptance in urban heritage tourism. *Current Issues in Tourism*, online first: 1–21.
- Di Serio, Á., Ibáñez, M. B., & Kloos, C. D. (2013). Impact of an augmented reality system on students' motivation for a visual art course. *Computers & Education*, 68, 586–596.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Gefen, D., Straub, D., & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, 4(7), 1–70.
- Guerra, J. P., Pinto, M. M., & Beato, C. (2015). Virtual reality-shows a new vision for tourism and heritage. *European Scientific Journal*, 11(9), 49–54.
- Guttentag, D. A. (2010). Virtual reality: Applications and implications for tourism. *Tourism Management*, 31(5), 637–651.
- Han, D. I., Jung, T., & Gibson, A. (2013). Dublin AR: Implementing augmented reality in tourism. In *Information and Communication Technologies in Tourism 2014* (pp. 511–523). Springer International Publishing.

- Heeter, C. (1992). Being there: The subjective experience of presence. *Presence: Teleoperators and Virtual Environments*, 1(2), 262–271.
- Hosany, S., & Witham, M. (2010). Dimensions of cruisers' experiences, satisfaction, and intention to recommend. *Journal of Travel Research*, 49(3), 351–364.
- Jung, T., Chung, N., & Leue, M. C. (2015). The determinants of recommendations to use augmented reality technologies: The case of a Korean theme park. *Tourism Management*, 49, 75–86.
- Jung, S., Kim, S., & Kim, S. (2013). Augmented reality-based exhibit information personalized service architecture through spectator's context analysis. *International Journal of Multimedia and Ubiquitous Engineering*, 8(4), 313–320.
- Kang, M., & Gretzel, U. (2012). Effects of podcast tours on tourist experiences in a national park. *Tourism Management*, 33(2), 440–455.
- Keng, C. J., Huang, T. L., Zheng, L. J., & Hsu, M. K. (2007). Modeling service encounters and customer experiential value in retailing: An empirical investigation of shopping mall customers in Taiwan. *International Journal of Service Industry Management*, 18(4), 349–367.
- Kounavis, C. D., Kasimati, A. E., & Zamani, E. D. (2012). Enhancing the tourism experience through mobile augmented reality: Challenges and prospects. *International Journal of Engineering Business Management*, 4(10), 1–6.
- Lee, K. M. (2002). *Social responses to synthesized speech: Theory and application*. Stanford, CA: Stanford University.
- Lee, H., Chung, N., & Jung, T. (2015). Examining the cultural differences in acceptance of mobile augmented reality: Comparison of South Korea and Ireland. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism* (pp. 477–491). Heidelberg: Springer.
- Lee, H., Chung, N., & Koo, C. (2015). Moderating effects of distrust and social influence on aesthetic experience of augmented reality: Motivation—Opportunity—Ability model perspective. In *Proceedings of the 17th International Conference on Electronic Commerce 2015* (p. 22). New York: ACM.
- Lee, K., Lee, H. R., & Ham, S. (2013). The effects of presence induced by smartphone applications on tourism: Application to cultural heritage attractions. In *Information and communication technologies in tourism 2014* (pp. 59–72). Vienna: Springer.
- Leue, M. C., Jung, T., & tom Dieck, D. (2015). Google glass augmented reality: Generic learning outcomes for art galleries. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 463–476). Vienna: Springer.
- Löfgren, O. (2008). The secret lives of tourists: Delays, disappointments and daydreams. *Scandinavian Journal of Hospitality and Tourism*, 8(1), 85–101.
- Marković, S. (2010). Aesthetic experience and the emotional content of paintings. *Psihologija*, 43(1), 47–64.
- Marriott. (2014). #GetTeleported. Available at: <http://news.marriott.com/2014/09/getteleported-the-most-immersive-4-d-virtual-travel-experience-arrives-taking-guests-to-parts-known-and-unknown-as-marri.html>
- Mehmetoglu, M., & Engen, M. (2011). Pine and Gilmore's concept of experience economy and its dimensions: An empirical examination in tourism. *Journal of Quality Assurance in Hospitality & Tourism*, 12(4), 237–255.
- Menon, S., & Kahn, B. (2002). Cross-category effects of induced arousal and pleasure on the Internet shopping experience. *Journal of Retailing*, 78(1), 31–40.
- Mintz, R., Litvak, S., & Yair, Y. (2001). 3D-virtual reality in science education: An implication for astronomy teaching. *Journal of Computers in Mathematics and Science Teaching*, 20(3), 293–305.
- Morgan, M., Elbe, J., & de Esteban Curiel, J. (2009). Has the experience economy arrived? The views of destination managers in three visitor-dependent areas. *International Journal of Tourism Research*, 11(2), 201–216.

- Oh, H., Fiore, A. M., & Jeung, M. (2007). Measuring experience economy concepts: Tourism applications. *Journal of Travel Research*, 46(2), 119–132.
- Pine, B. J., & Gilmore, J. H. (1998). Welcome to the experience economy. *Harvard Business Review*, 76, 97–105.
- Pine, B. J., & Gilmore, J. H. (1999). *The experience economy: Work is theatre & every business a stage*. Boston: Harvard Business Press.
- Schuemie, M. J., Van Der Straaten, P., Krijn, M., & Van Der Mast, C. A. (2001). Research on presence in virtual reality: A survey. *CyberPsychology & Behavior*, 4(2), 183–201.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London, England: Wiley.
- Sternberg, E. (1997). The iconography of the tourism experience. *Annals of Tourism Research*, 24(4), 951–969.
- Steuer, J., Biocca, F., & Levy, M. R. (1995). Defining virtual reality: Dimensions determining telepresence. In F. Biocca & M. R. Levy (Eds.), *Communication in the age of virtual reality* (pp. 33–56). Mahwah, NJ: Lawrence Erlbaum Associates.
- Urry, J. (2002). *The tourist gaze*. London, UK: Sage.
- Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly*, 28(4), 695–704.

# Understanding the Acceptance of Augmented Reality at an Organisational Level: The Case of Geevor Tin Mine Museum

Eleanor Cranmer, Timothy Jung, M. Claudia tom Dieck,  
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**Abstract** Augmented Reality (AR) has recently emerged as a popular tool for tourism organisations to enhance visitors' experiences through its ability to overlay information into the real world environment. Cultural heritage attractions such as museums have begun exploring the potentials and benefits of AR, but it remains a largely new field of research. The importance of user acceptance and adoption studies are well established; however, research into the implementation of AR from an organisational perspective is scarce. This study therefore aims to understand the perception towards AR implementation at an organisational level using semi-structured interviews with nine internal stakeholders at Geevor museum. Interviews were analysed using content analysis and findings demonstrate positive support for AR implementation, identifying a variety of potential ways it could enhance the experience of both visitors and staff.

**Keywords** Augmented reality • Technology adoption • Museum • Organisational perspective

## 1 Introduction

In recent years, there has been an increasing pressure for tourism organisations to find new ways to deliver enhanced and unique tourist experiences (Yovcheva, Buhalis, & Gatzidis, 2013). Technology has now become a part of our everyday lives (Palumbo, Dominci, & Basile, 2013), growing the need for organisations to provide access to information available anytime, anywhere (Kounavis, Kasimati, & Zamani, 2012). As a result, it has become increasingly necessary for tourism organisations to adopt new technologies in order to stay competitive and attractive to tourists (Han, Jung, & Gibson, 2014). Hence AR, because of its ability to overlay information in the real environment (Leue, Jung, & tom Dieck, 2015), has emerged

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as a popular tool to enhance the visitor experience (Hume & Mills, 2011). Despite the newness of the field, numerous studies recognise the opportunities and potential of using AR in tourism and a number of AR applications were developed for cultural heritage attractions such as museums and art galleries.

An important part of implementing a new technological innovation is to assess and understand the organisational perspective and adoption among users. Numerous studies evaluate the determinants of IT adoption to understand the factors that influence acceptance and use (e.g. Bharadwaj & Soni, 2007; Fuller, 1996; Irvine & Anderson, 2008; Thong, 1999). Ultimately, if there is no support from the organisation and users are not ready or willing to accept new technologies, implementation would be a waste of time, money and resources. Models such as TAM (Technology Acceptance Model), DOI (Diffusion of Innovation theory) and Technology, Organisation, Environment (TOE) framework are widely applied to evaluate user and firm-level intention to accept and adopt technologies. Such models are important for developers and managers to understand what factors influence effective and successful technology use. However, despite its growing importance, little research has attempted to understand user satisfaction, intention to use and accept AR applications in tourism (Haugstvedt & Krogstie, 2012; Jung, Chung, & Leue, 2015). Likewise, limited research has tried to understand user acceptance of AR, but even more scarce are studies assessing organisations' perceptions towards AR implementation. Despite the fact understanding an organisations' willingness to adopt and accept new technologies like AR is recognised as fundamental for the success and longevity of implementations. This study aims to contribute to knowledge by understanding how the introduction of AR is perceived at an organisational level. Geevor Tin Mine Museum, a UNESCO World heritage site and cultural mining heritage tourism attraction in Cornwall is used as a case example.

## 2 Literature Review

### 2.1 *Augmented Reality in Tourism*

AR technology “represents a system where a view of a live real physical environment is supplemented by computer-generated elements such as sound, video, graphic or location data” (Taqvi, 2013, p. 11). Therefore, it immerses its users in a virtually enhanced world (Di Serio, Ibanez, & Kloos, 2013), improving their perception of, or interaction with, the real world (Roesner, Kohno, & Molnar, 2014). Based upon these characteristics, it is widely praised for its educational and entertainment potential (Wu, Lee, Chang, & Liang, 2013), creating new possibilities to deliver richer, more immersive content (Leue, tom Dieck, & Jung, 2014), changing the users' view of their immediate surroundings (Wang, Kim, Love, & Kang, 2013; Wasko, 2013).



The practical ability of AR to allow tourists with limited knowledge of an area to naturally and realistically experience their surroundings has excelled AR to become a widely accepted and valuable tool in tourism (Chung, Han, & Joun, 2015; Martínez-Graña, Goy, & Cimarra, 2013; von der Pütten et al., 2012). However, contrary to expectations, AR is still not being widely and actively used as adoption has been slower than anticipated (Chung et al., 2015). Nonetheless, a small number of applications (e.g. ArcheoGuide, Museum Zoom) have been developed to begin exploring the potential AR presents to cultural heritage attractions such as museums and art galleries. Such apps aim to create 'info-cultural-tainment' experiences, combining leisure, entertainment, cultural, educational and social experiences (Palumbo et al., 2013). Despite the limited number of studies, they demonstrate a positive response to AR and recognise its potential as a tool for education and interpretation (Casella & Coelho, 2013). One of AR's great strengths is identified in its ability to tailor information to an individual's preferences and knowledge level (Garcia-Crespo et al., 2009; Kounavis et al., 2012). This is recognised as particularly important because high-quality interpretation can add considerable value to an attraction, giving it competitive edge and increasing the potential of repeat visits (Timothy, 2011).

The increased availability of AR applications enables visitors to construct personal and context-aware experiences (Chou & ChanLin, 2012; Yovcheva et al., 2013). In some cases, Chung et al. (2015) believe the availability of AR applications may be the sole reason people visit attractions. However, introducing AR apps to a tourist destination does not always bring positive experiences (Yovcheva et al., 2013). Research by Lanir, Kuflik, Dim, Wecker, and Stock (2013) demonstrates AR applications affect users' behaviour and interactions. Their research indicates when using a mobile guide visitors stayed longer, were attracted to and spent longer at each exhibit. Although it had also had negative affect by reducing interaction among groups and proximity to exhibits. These affects combined with implementation costs create complex decisions for organisations considering introducing AR into their visitor experience.

## ***2.2 AR Acceptance at an Organisational Level***

Despite large investments into new technologies, many attempts to implement IT innovations in organisations fail because internal stakeholders do not use and accept it (Mitchell, Gagné, Beaudry, & Dyer, 2012). Studies attempting to understand the acceptance of new technologies propose IT usage is explained by the beliefs and attitudes that employees hold towards technology (Mitchell et al., 2012). Therefore, it is of considerable importance to understand organisational characteristics in the adoption and acceptance of new technologies (Thong, 1999).

Thus, in the last 20 years a number of technology adoption models have emerged attempting to understand IT usage and adoption (Venkatesh, Morris, Davis, & Davis, 2003). Perhaps the most well-known is TAM developed by Davis (1989)

which looks at perceived ease of use and usefulness of individuals towards new technologies, in attempt to explain acceptance (Lippert & Govindarajulu, 2015). However, TAM is used to identify user acceptance and is therefore not directly relevant at an organisational level. The DOI theory and TOE framework are the only significant models that focus on technology acceptance and adoption at an organisational firm level and most other relevant models are derived from them (Oliveira & Martins, 2011). DOI theory, proposed by Rogers (1995), suggests the diffusion of an innovation is based upon two principles; (1) characteristics of the technology, (2) users' perception of the technology. It assumes adoption decisions are chosen with the hope they will improve or increase operational efficiency. This diffusion is related to three independent variables; individual characteristics (e.g. the leaders attitude towards change), internal characteristics of an organisations structure (e.g. centralisation, complexity, formulisation, interconnectedness, organisational slack and size) and external characteristics (e.g. the organisations openness).

On the other hand, TOE, developed in 1990 by Tomatzky and Fleischer (1990), identifies three elements of an organisations context that influence the process by which it adopts and implements a technological innovation. Firstly, technological context, which analyses elements such as, perceived direct/indirect benefits/barriers, technology readiness. Secondly, organisational context that looks at factors like perceived financial costs, technical competence, consumer readiness, firm size, financial commitment. Thirdly, environmental context which assess the arena in which the organisation conducts business, analysing competitors, fear and uncertainty and acceptance of internal employees (Oliveira & Martins, 2011). Both DOI and TOE have been extensively applied to understand the adoption of new technologies such as e-business and e-commerce in organisations, however their association with AR implementation is nominal. All organisations have different structures, strategies and goals thus, substantial variations have been identified between large firms and small to medium sized enterprises (SMEs), thus firm size and scope have a powerful influence on technology adoption (Rogers, 1995; Tomatzky & Fleischer, 1990). Large organisations have more resources, economies of scale and the ability to take greater risks with regard to innovation and technology adoption (Gibbs & Kraemer, 2004; Thong, 1999; Zhu, Kraemer, & Xu, 2003). In comparison, SMEs, such as Geevor have resource and funding limitations so tend to be more cautious in the adoption of new technologies. But, SMEs do have an advantage of increased agility and flexibility toward change (Lippert & Govindarajulu, 2015). Despite this, Nguyen, Newby, and Macaulay (2015) suggest it is not clear whether SMEs see technology adoption as an opportunity or threat. Initial contact with Geevor demonstrates a positive perception towards the implementation of AR. Geevor Museum is a small council owned and publically funded organisation, thus the overall acceptance of AR at Geevor depends heavily upon the acceptance and full support of the organisation. This makes it crucial to understand and evaluate the perception of a range of internal stakeholder towards AR adoption, to guide implementation and development processes, whilst also increasing the success and longevity of implementing AR at Geevor.

### 3 Methods

Existing research attempting to understand the implementation of AR from an organisational perspective is scarce. The case of Geevor Tin Mine Museum is explored to understand the perception towards AR implementation at an organisational level. As a new area of research the study is exploratory, permitting the identification of key themes, promotes understanding and highlights avenues requiring further research. Nine semi-structured interviews were held during March 2015 with a range of internal stakeholders. A semi-structured approach enabled the freedom to add to, and extend questions to provide enriched data (Gillham, 2005; Saunders, Lewis, & Thornhill, 2012; Veal, 2006). Non-probability sampling was employed principally for practical and resource reasons, but equally it is recognised as common in the exploratory stages of studies (Saunders et al., 2012). The selected respondents are considered the most knowledgeable and well-informed people in the organisation (Greenfield, 2002), possessing the highest ability to provide the richest data (Garrod, Wornell, & Youell, 2006). The small organisational scope of Geevor is beneficial; having a small staff base it was possible to gain insight from a variety of perspectives to generate a more complete overview involving the entirety of the organisation. The variety of respondents' roles within Geevor from management to operations creates a more complete picture, their variety of perspectives helps to capture and understand the complexity of elements that combine to produce a tourist product. Subsequent to interviews, respondents were provided with an introductory letter, information sheet and short video clip example of an AR application in a museum. This ensured all respondents had a proficient and un-influenced understanding of ARs potential and limitations to adequately answer questions. It was considered that providing an application prototype would have introduced an element of bias, influencing and inflicting concepts. Whereas limiting the explanation and demonstration of AR promoted discussion by allowing respondents to interpret their own understanding of ARs use and potential at Geevor. Interview questions contained a variety of prompts, topics and open questions as suggested by Harding (2013), to produce the greatest data and understanding of the context. Interviews were recorded and transcribed. Data was then analysed using content analysis to allow the identification of patterns within data to be categorised, compared and contrasted (Cavana, Delahaye, & Sekaran, 2001). A profile of respondents is presented in Table 1 demonstrating their levels of understanding of AR prior to interviews (44 % low, 44 % moderate, 12 % high).

**Table 1** Respondent profile

Code	Position	Time at Geevor (Years)	Prior understanding of AR
TR	Trustee	3	Moderate
CT	Chair of Trustees	2.5	Moderate
MA	Marketing Assistant	3	Low
LDO	Learning Development Officer	8	Moderate
MDO	Mine Development Officer	20 +	Low
MG	Mine Guide	10+	Low
CU	Curator	8	Low
IT	Information Technology Manager	10	High
MM	Mine Manager	11	Moderate

## 4 Findings

### 4.1 Potential of AR at Geevor

It was suggested using AR could create a multi-sensory environment delivering a better experience to all visitors, but especially those visiting without a guide and children (LDO). The educational side of Geevor is a large part of the business and respondents believed AR has the potential to increase Geevor's appeal to visitors of all ages by enhancing its learning facilities (TR, CT, MA, MG, LDO and CU). MM summarised "the educational side of things is extremely important because if we don't engage with the youngsters as they grow up they aren't going to engage with a site like this. . .when they have kids, they are the future visitor". Similarly, CT agreed, "children love it. . .visits are driven by children and their reaction to it". Likewise using AR, CT believed there is potential to improve visitors' pre, during and post visitor experience, helping get the message out there to attract more visitors and encourage repeat visits.

Respondents identified problems during peak months when staff availability is limited, however AR was recognised as a potential tool to alleviate pressure on staff, thus avoiding additional hiring costs whilst also delivering an enhanced experience to visitors. IT recognised that especially during summer "staff are in fixed positions, so the site basically has nobody on it to tell tourists what they are looking at, so AR could help people interpret what they are looking at. . .AR is the perfect substitute for people". Similarly, LDO suggested "it could take over our job for the informal visitors that we are not accessible to".

Respondents (TR, LDO, IT and MM) agreed AR would modernise Geevor, raising its profile to "bring it more into the modern age, make it more up to date and bring it into this century" (TR). MA suggested this would make the site more attractive, shifting the focus onto being a tourist attraction rather than an old tin mine. Although Geevor has sheltered monument status meaning its appearance cannot change, MDO believed using AR "you can improve by bringing the site to

life". Overall, as MM and MA summarised you have to do things to attract tourists and make them want to visit, you cannot just sit back and wait.

## **4.2 *Perceived Value of AR***

Using AR to engage children, its novelty factors and ability to cater to different knowledge levels were identified as potential value-adding benefits. The majority of respondents (CT, MA, LDO, MDO, CU, MM) thought AR would help to attract and engage younger people, giving them more to do. LDO believed AR would also help parents "have an understanding of the site to do the interpretation in order to draw out the bits that children really enjoy". Therefore, AR could extend the existing offer allowing visitors to get more out of their visits (TR, MA, LDO, CU, IT). TR suggested having AR would be "an advantage to encourage people to come in. . .no one else has got it". Thus, LDO understood AR would contribute to a positive perception change about the sort of museum Geevor is from an "old dusty museum" to one with exciting new modern technologies.

Although, importantly as highlighted by CU, AR may not appeal to everyone as "different people like different sorts of interpretation". Nevertheless, as IT and CU acknowledged people do not have to use it, but overall it was recognised AR offers a more exciting and interactive way to provide information than traditional boards and signage (TR, CT, MG, CU). AR also has the advantage of allowing visitors to return to, or recall information (CT) and the ability to provide additional information about anything on site (MG, MDO). Finally, MM and IT noted the potential to charge more to use AR because ultimately, AR will attract a different market and in general add-value allowing people to get much more out of their visits.

## **4.3 *Perceived Staff Benefits***

Respondents agreed AR would be beneficial to them as staff, by introducing an element of fun (CU), keeping them engaged (MDO), raising morale (MM) and overall demonstrating that the site was advancing (LDO, MA). Using AR to engage younger people was identified as particularly important, making the job of staff in educating and guiding more fun and interesting (TR, CT, MA, MDO, CU, IT). The role of AR in helping interpret the site for individuals with disabilities (e.g. visual or hearing impairment) was noted by CU as a significant benefit. MDO recognised the potential of using AR to preserve knowledge from older members of staff for when they are no longer there. This is fundamentally important since it has been identified by nearly all respondents as a key value offering and strength of Geevor. Preserving first-hand knowledge is vital to ensure that the authenticity of the experience offered currently is not lost and continues to be an asset for Geevor in years to come.

#### ***4.4 Perceived Visitor Benefits***

Using AR to enhance interpretation of the site and to extend the appeal to attract younger and more modern visitors (MG, CU, IT, LDO, MDO, MM) were identified as particularly beneficial. To improve the visitor experience, respondents suggested using AR to support staff (IT, MM, TR, MG). IT summarised AR “can really enhance interpretation. . .but the visitor will also be looked after a bit better, as we don’t have the staff to do that lovely face-to-face part”. Another use of AR suggested by MM was to provide interactivity to entertain children creating a happy family unit because “if the kids are happy, mum and dad are happy and so on”. On the other hand, it was acknowledged that AR would need to be carefully and sympathetically implemented to add to, not detract from existing features (CT, CU, MM). Achieving this balance, MDO believed, it would make visits “a bit more fun as well as being factually educational”. Which LDO suggested would help target the site to lots of different users. Overall, as pointed out by CU individuals have the choice to use AR or not, it is an additional tool for interpretation, education and enjoyment.

#### ***4.5 Perceived Organisational Benefits***

IT believed AR could reduce visitors’ gap in knowledge since “they are able to either be shown around solely by their app and ask it to go wherever they like and know exactly where and what is was”. It is expected by LDO AR will improve the efficiency of explaining complex processes through animations rather than a guides 15-min explanation, thus increasing knowledge. AR is recognised to be a “total add on, not to detract from what is already here. . .people will get it a lot more quickly and therefore hopefully stay a lot longer” (IT). However, CU, MDO and LDO claim AR would not be for everyone, but it is an added bonus people can choose to use. CU summarised “it is a very good idea, I can see people enjoying using it. . .nearly everyone has a phone these days, if it can help enhance their experience and enjoyment it’s amazing, no one can lose out really”. Although, IT recognised if people do not own a mobile device it would not work, but suggested a solution could be if Geevor loaned devices to visitors. There was acknowledgment AR would attract more people increasing visitor admissions (LDO, MDO, MM). MG suggested reviews and comments about AR on social media would help attract more individuals who previously would not have chosen to visit Geevor. MM proposed AR would contribute a positive perception change offering more things to do and engaging more visitors, which would involve “just about every customer that we are looking for”. CT believed an AR app would increase visitors’ awareness of site facilities potentially encouraging them to spend more. Likewise, TR and MM noted an AR experience could be linked to the café and shop. However, CU acknowledged implementation would have to be very subtle “you have to give

them [visitors] a good enough experience that they want to spend something in the shop". Lastly, IT suggested the obvious potential of selling an AR app as an extra add-on, but noted, "whether that is actually workable in reality I couldn't tell you".

#### ***4.6 Perceived Impact of AR***

It was agreed by all respondents AR would make a positive impact to Geevor. IT claimed, "I think we should adopt it 100 %". A similar statement was made by TR who suggested "I don't think it could not have a difference". CT eluded to the economic potential of implementing AR exclaiming "in terms of revenue and numbers it would enhance it no end". MM noted throughout Geevor's history technological innovation has always played a key role, such as developing new drilling techniques therefore introducing AR is a way to demonstrate Geevor is still innovative, whilst also improving the visitor experience. The support for AR introduction is apparent, but as LDO suggested in order to make a positive impact, it would have to be "completely embraced and done whole heartedly and marketed". Some respondents (LDO, CU, IT) acknowledged potential negative impacts of increased workload, responsibility and technical issues, but nonetheless upheld significantly positive attitudes to AR implementation.

#### ***4.7 Perceived Barriers and Considerations***

The need to fully educate staff about the benefits and potential of AR was widely recommended (TR, CT, LDO, MDO, MG). LDO suggested, "People need to think it is important because that is the biggest hurdle really", similarly, TR discussed the "need of communication to identify the added value it would provide". On this note, CT believe staff resistance would be minimised if they were more educated and understood the benefits of AR as ultimately "it may secure their job. . .the more money we have on site the more secure their jobs are". TR and CT believed AR needs to be explained sympathetically, highlighting it will not change anything, but enhance and improve the experience "to benefit you [staff] making the site more successful" (CT). Although MG summarised "I don't think you would find a member of staff who wouldn't be willing to give you as much time and input as they possibly could. . .we really care about the site". Establishing the balance between technology use, without losing the attraction of the place was suggested as important by MDO. CT, LDO, MDO and IT identified the biggest barrier is assuming everybody has a mobile phone or personal device to use the application, but it was noted Geevor could loan devices to visitors (IT). Furthermore, MDO suggested not only do visitors need a personal device, but one that has enough specifications, memory and a sufficient system for an AR application to work. Likewise, IT suggested there many issues with downloading of the application,

recognising that Geevor as a site has poor phone signal, although granting this could be resolved with use of markers or Bluetooth technology. The consensus among respondents as summarised by MG is that “if the costs are low and the risks are low, yes lets go for it as long as it is not conflicting with anything we are already doing on site”.

## 5 Discussion and Conclusion

Interviews revealed each respondent recognises the potential of using AR to enhance and improve both education and the visitor experience. These are two key benefits of AR use in tourism attractions also identified in literature (Fino, Martín-Gutiérrez, Fernández, & Davara, 2013; Lee, 2012; Wu et al., 2013). Respondents believed AR implementation would modernise Geevor’s existing offering moving it into the twenty-first century. The need for tourism organisations to embrace modern technologies to fight to remain competitive and continue attracting tourists is identified as crucial within literature (Han et al., 2014; Haugstvedt & Krogstie, 2012; Palumbo et al., 2013). However, despite strong support from respondents, the need for a clear implementation strategy is emphasised, to ensure AR implementation does not conflict with any other existing projects and the maximum benefits are realised for both the visitors and stakeholders. Likewise, as Levy, Powell, and Yetton (2001) highlight technology adoption in SMEs often occurs without proper planning which contributes to a low success rate. It is clear that without organisational support for AR, its implementation would be unsuccessful. Hence, there is a fundamental need to further educate internal stakeholders about exactly what AR implementation entails and the expected outcomes. A further study should consider debating the potential limitations and barriers involved with AR implementation, to discern how an organisation would overcome these. Internal stakeholders need to realise the full value of AR for themselves as one respondent suggested, in order to gain their full backing. Nonetheless, support was positive, respondents suggested a number of ways in which AR could help increase income by attracting more visitors and improving marketing material, both of which are benefits of AR discussed within literature (Lashkari, Parhizkar, & Mohamedali, 2010; Thompson, 2010; Yuen, Yaoyuneyong, & Johnson, 2011).

The aim of the study was to understand an organisational perspective towards the implementation of AR using Geevor Tin Mine Museum as a case study. This study extends our understanding of the considerations and factors that influence an organisation to adopt and accept new technologies. Thereby contributing to theory and creating new knowledge, by suggesting factors to be considered when designing or implementing AR applications. This is particularly true as there are only a limited number of studies on AR implementation in cultural heritage tourism (Han et al., 2014; tom Dieck & Jung, 2015). Even more scarce are studies from an internal stakeholder perspective and therefore this study makes a contribution to existing theory, bridging a notable gap in research. In the context of cultural



heritage tourism, AR use and implementation remains largely underexplored (Cranmer & Jung, 2014), and it is therefore suggested AR remains to be meaningfully implemented (Han et al., 2014). Contrary to expectations, AR is still not actively and widely used, adoption has been much slower than anticipated (Chung et al., 2015). From a managerial and industry perspective, the study helps practitioners such as application developers and visitor attraction managers to understand an organisational perspective towards AR implementation. This will help practitioners ensure their organisation creates, develops and implements applications that best suit the organisations strategies as well as providing maximum benefits and added value. Overall, the study demonstrates the variety of ways in which AR can be implemented to provide added benefit, improve existing operations, generate income and enhance the visitor experience.

However, this study has a number of limitations and recommendations for further research. The findings present a study solely based on Geevor Tin Mine Museums as a case example and therefore findings are hard to generalise and to apply to other cultural heritage attractions. Although, findings can be used to provide context and an insight into the perspective and concerns of organisations thinking of adopting AR. Likewise, since Geevor is a small organisation, with a small staff base, the findings would be hard to generalise to a larger organisation or visitor attraction with more complex stakeholder networks. Nonetheless, the use of AR to enhance the tourist experience and learning has been clearly identified along with a number of other ways AR can improve the tourist experience. These could be applied to other attractions, but it is suggested to conduct a context specific study prior to AR implementation. This study adopted an exploratory approach; therefore, issues such as technical, user and financial implications would require further exploration. The study is also limited by only focusing on internal stakeholders. Therefore, it is recommended research is extended to understand the perception of external stakeholders (e.g. visitors, business partners, local tour operations and importantly customers), to provide a more comprehensive and complete overview towards AR implementation. It would also be recommended to conduct interviews or discussions with internal stakeholders throughout the implementation does not lose sight of the overall goals and strategies of the organisation.

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## References

- Bharadwaj, P., & Soni, R. (2007). E-commerce usage and perception of e-commerce issues among small firms: Results and implications from an empirical study. *Journal of Small Business Management*, 45(4), 501–521.
- Casella, G., & Coelho, M. (Eds.). (2013). *Augmented heritage—Situating augmented reality mobile apps in cultural heritage communication: International Conference on Information Systems and Design of Communication, Lisbon, Portugal*. New York: ACM.

- Cavana, R., Delahaye, B., & Sekaran, U. (2001). *Applied business research qualitative and quantitative methods* (3rd ed.). Milton: Wiley.
- Chou, T.-L., & ChanLin, L.-J. (2012). Augmented reality smartphone environment orientation application: A case study of the Fu-Jen University mobile campus touring system. *Procedia—Social and Behavioural Sciences*, 46(1), 410–416.
- Chung, N., Han, H., & Joun, Y. (2015). Tourists' intention to visit destination: Role of augmented reality applications for heritage site. *Computers in Human Behaviour*, 50, 588–599.
- Cranmer, E., & Jung, T. (2014). *Augmented reality (AR): Business models in urban cultural heritage tourist destinations. Pacific Council on hotel, restaurant and institutional education: APacCHRIE, Kuala Lumpur*. Manchester: Research Gate.
- Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Di Serio, A., Ibanez, M., & Kloos, C. (2013). Impact of an augmented reality system on students' motivation for a visual art course. *Computers & Education*, 68(1), 586–596.
- Fino, E., Martín-Gutiérrez, J., Fernández, M., & Davara, E. (2013). Interactive tourist guide: Connecting Web 2.0, augmented reality and QR codes. *Procedia Computer Science*, 25, 338–344.
- Fuller, T. (1996). Fulfilling IT needs in small businesses: A recursive learning model. *International Small Business Journal*, 14(4), 25–44.
- García-Crespo, A., Chamizon, J., Rivera, I., Mencke, M., Colomo-Palacios, R., & Gomez-Berbis, J. (2009). SPETA: Social pervasive e-tourism advisor. *Telematics and Informatics*, 26(3), 306–315.
- Garrod, B., Wornell, R., & Youell, R. (2006). Re-conceptualising rural resources as countryside capital: The case of rural tourism. *Journal of Rural Studies*, 22(1), 117–128.
- Gibbs, J., & Kraemer, K. (2004). A cross-country investigation of the determinants of scope of e-commerce use: An institutional approach. *Electronic Markets*, 14(2), 124–137.
- Gillham, B. (2005). *Research interviewing: The range of techniques*. Berkshire: McGraw-Hill Education.
- Greenfield, T. (2002). *Research methods for postgraduates*. London: Arnold.
- Han, D. I., Jung, T., & Gibson, A. (2014). Dublin AR: Implementing augmented reality in tourism. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 511–523). Vienna: Springer.
- Harding, J. (2013). *Qualitative data analysis form start to finish*. London: Sage.
- Haugstvedt, A. C., & Krogstie, J. (2012, November). Mobile augmented reality for cultural heritage: A technology acceptance study. In *Mixed and Augmented Reality (ISMAR), 2012 IEEE International Symposium on* (pp. 247–255). IEEE.
- Hume, M., & Mills, M. (2011). Building the sustainable iMuseum: Is the virtual museum leaving our museums virtually empty. *International Journal of Non-profit & Voluntary Sector Marketing*, 16(3), 275–289.
- Irvine, W., & Anderson, A. (2008). ICT (information communication technology), peripherally and smaller hospitality businesses in Scotland. *International Journal of Entrepreneurial Behaviour & Research*, 14(4), 200–218.
- Jung, T., Chung, N., & Leue, M. (2015). The determinants of recommendations to use augmented reality technologies: The case of a Korean theme park. *Tourism Management*, 49(1), 75–86.
- Kounavis, C., Kasimati, A., & Zamani, E. (2012). Enhancing the tourist experience through mobile augmented reality: Challenges and prospects. *International Journal of Engineering Business Management*, 4(10), 1–6.
- Lanir, J., Kuflik, T., Dim, E., Wecker, A., & Stock, O. (2013). The influence of a location-aware mobile guide on museum visitors' behaviour. *Interacting with Computers*, 25(6), 443–460.
- Lashkari, A., Parhizkar, B., & Mohamedali, M. (2010, May). *Augmented reality tourist catalogue using mobile technology*. Paper presented at *Second International Conference on Computer Research and Development*. Kuala Lumpur: IEEE.
- Lee, K. (2012). Augmented reality in education and training. *Tech Trends*, 56(1), 13–21.

- Leue, M. C., Jung, T., & tom Dieck, D. (2015). Google glass augmented reality: Generic learning outcomes for art galleries. In I. Tussyadiah & A. Invesini (Eds.), *Information and communication technologies in tourism 2015* (pp. 463–476). Heidelberg: Springer.
- Leue, M., tom Dieck, D., & Jung, T. (2014). A theoretical model of augmented reality acceptance. *E-Review of Tourism Research*, 5, 1–5.
- Levy, M., Powell, P., & Yetton, P. (2001). SMEs: Aligning IS and the strategic context. *Journal of Information Technology*, 16(3), 133–144.
- Lippert, S. K., & Govindarajulu, C. (2015). Technological, organizational, and environmental antecedents to web services adoption. *Communications of the IIMA*, 6(1), 14.
- Martínez-Graña, A., Goy, J., & Cimarra, C. (2013). A virtual tour of geological heritage: Valourising geodiversity using Google Earth and QR code. *Computers & Geosciences*, 61 (12), 83–93.
- Mitchell, J. I., Gagné, M., Beaudry, A., & Dyer, L. (2012). The role of perceived organizational support, distributive justice and motivation in reactions to new information technology. *Computers in Human Behaviour*, 28(2), 729–738.
- Nguyen, T., Newby, M., & Macaulay, M. (2015). Information technology adoption in small business: Confirmation of a proposed framework. *Journal of Small Business Management*, 53(1), 207–227.
- Oliveira, T., & Martins, M. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation*, 14(1), 110–121.
- Palumbo, F., Dominci, G., & Basile, G. (2013). Designing a mobile app for museums according to the drivers of visitor satisfaction. In *Recent advances in business management and marketing: Proceedings of the 1<sup>st</sup> International Conference on Management, Marketing, Tourism, Retail, Finance and Computer Applications (MATREFC'13)*. Dubrovnik, Croatia: WSEAS Press.
- Roesner, F., Kohno, T., & Molnar, D. (2014). Security and privacy for augmented reality systems. *Communications of the ACM*, 57(4), 88–96.
- Rogers, E. (1995). *Diffusion of innovations*. New York: Everett.
- Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research methods for business students*. New York: Pearson.
- Taqvi, Z. (2013, December). Reality and perception: Utilization of many facets of augmented reality. In *23rd International Conference on Artificial Reality and Telexistence (ICAT)*. Houston, TX: IEEE.
- Thompson, S. (2010). Augmented reality campaign kicks off at selfridges. *Retail Systems* [Online]. Accessed 17 October 2014. [http://www.retailsystems.com/rs/Selfridges\\_Tissot.php](http://www.retailsystems.com/rs/Selfridges_Tissot.php)
- Thong, J. Y. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems*, 15(4), 187–214.
- Timothy, D. J. (2011). *Cultural heritage and tourism: An introduction*. Bristol: Channel View.
- tom Dieck, M. C., & Jung, T. (2015). A theoretical model of mobile augmented reality acceptance in urban heritage tourism. *Current Issues in Tourism*, 18, 1–21.
- Tomatzky, L., & Fleischer, M. (1990). *The process of technology innovation*. Lexington: Lexington Books.
- Veal, A. (2006). *Research methods for leisure and tourism: A practical guide*. Essex: Pearson Education.
- Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478.
- von der Pütten, A., Klatt, J., Ten Broeke, S., McCall, R., Krämer, N., Wetzel, R., et al. (2012). Subjective and behavioural presence measurement and interactivity in the collaborative augmented reality game TimeWarp. *Interacting with Computers*, 24(4), 317–325.
- Wang, X., Kim, M., Love, P., & Kang, S.-C. (2013). Augmented reality in built environment: Classification and implications for future research. *Automation in Construction*, 32(1), 1–13.
- Wasko, C. (2013). What teachers need to know about augmented reality enhanced learning. *Tech Trends*, 57(1), 17–21.

- Wu, H.-K., Lee, S. W.-Y., Chang, H.-Y., & Liang, J.-C. (2013). Current status, opportunities and challenges of augmented reality in education. *Computers & Education*, *62*(2013), 41–49.
- Yovcheva, Z., Buhalis, D., & Gatzidis, C. (2013). Engineering augmented tourism experiences. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism 2013* (pp. 24–36). Heidelberg: Springer.
- Yuen, S., Yaoyuneyong, G., & Johnson, E. (2011). Augmented reality: An overview and five directions for AR in education. *Journal of Educational Technology Development and Exchange*, *4*(1), 119–140.
- Zhu, K., Kraemer, K., & Xu, S. (2003). Electronic business adoption by European firms: A cross-country assessment of the facilitators and inhibitors. *European Journal of Information Systems*, *12*(4), 251–268.

**Part VII**  
**eLearning and MOOCs**

# MOOC Camp: A Flipped Classroom and Blended Learning Model

Jamie Murphy, J. Bruce Tracey, and Laurel Horton-Tognazzini

**Abstract** Massive Open Online Courses (MOOCs)—a burgeoning, and controversial educational innovation and research area—are emerging slowly in hospitality and tourism. Two major MOOC controversies are administering them and their completion rates. As MOOCs are free to anyone, anywhere, university administrators are scratching their heads about the requisite time and expense to share their classes and intellectual property. Similarly perplexing are MOOC completion rates of 5–10 %. Furthermore, are completion rates even a relevant MOOC measure? This paper introduces MOOC Camp, a novel U.S. Department of State initiative that uses existing MOOCs, blended learning and a flipped classroom to engage students and yield MOOC completion rates above 50 %. Preliminary MOOC Camp data illustrates the utility of an alternative MOOC success measure, *would enjoy taking more MOOCs*, as well as a fundamental academic measure, *learned a great deal*. The results give tourism and hospitality academics and practitioners an alternative MOOC conceptualisation and delivery model, without the expense of building or managing a MOOC, to augment training and education for students, employees and others.

**Keywords** Blended learning • Flipped classroom • MOOCs • United States Department of State

## 1 Introduction

Massive Open Online Courses (MOOCs) debuted in 2008 at the University of Manitoba and simmered with mere tens of thousands of participants per MOOC until 2011, when Stanford and the Massachusetts Institute of Technology (MIT) enrolled over 150,000 each in a single program (Daniel, 2012). The news media took notice; the New York Times named 2012 as the ‘Year of the MOOC’

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(Pappano, 2012). MOOCs offer free online education, often leading universities' actual courses, to tens of thousands of participants. Those that complete course requirements with a minimum mark, from 40 to 80 %, receive a certificate of completion—albeit no official credit—from host institutions such as Harvard, MIT and Stanford (Klobas, Mackintosh, & Murphy, 2014).

The available MOOCs keep increasing, doubling—2112–4277—from March 2014 to March 2015 (European Commission, 2015). A 2015 study, however, found just nine MOOCs that focused on hospitality and tourism (Horton-Tognazzini, Ryan, & Williams, 2015), or 0.2 % of the total available MOOCs. Such university hospitality and tourism MOOCs include those from the University of Central Florida, Cornell University and the Università della Svizzera italiana.

Similarly, hospitality and tourism MOOC awareness and research seem minimal (Hara, Moskal, & Saarinen, 2013; Murphy et al., 2014). A study of 144, mostly U. S., hospitality and tourism educators found that under half (43 %) were familiar or somewhat familiar with MOOCs and none were very familiar (Deale, 2015). Although four out of five educators (79 %) had taught online, 99 % had never taught a MOOC and 98 % had never participated in a MOOC.

A survey of 103 employers exploring the use of MOOCs for recruiting, hiring and professional development found a similar low MOOC awareness, 31 % (Radford et al., 2014). Once they understood MOOCs, the employers perceived MOOCs positively in hiring decisions. Applicants participating in MOOCs suggest motivation and a desire to learn. Over half the employers (59 %) would consider using MOOCs for recruiting and an “even higher percentage (83 %) were using, considering using, or could see their organisation using MOOCs for professional development” (Radford et al., 2014, p. 1).

Furthermore, employers, academia, educational institutions and learners note two growing hospitality and tourism trends that MOOCs can address: the importance of different learning styles, and lifelong education (Cuffy, Tribe, & Airey, 2012; Rodríguez-Antón, Alonso-Almeida, Andrada, & Pedroche, 2013). Interested learners of any age and education can participate in a MOOC, as little or as much as they like.

However despite MOOCs' many upsides, and similar to an innovation's early years (Rogers, 2003), the future of MOOCs is murky. In addition to challenges that stem from the lack of a sustainable business model and perceptions that MOOCs commoditise education, some of the most salient concerns center on the implementation and evaluation of MOOCs (Daniel, 2012; Dellarocas & Van Alstyne, 2013; Klobas et al., 2014). For example, the finding that only 5–10 % of MOOC participants earn a certificate of completion (Jordan, 2014; Murphy et al., 2014) is among several indicators that critics use to demonstrate the failure of MOOCs for both MOOC suppliers and MOOC users (Dolan, 2014).

It can also be argued that earning certificates reflects a traditional academic notion of attendance and completion, and as such, inappropriate for assessing MOOCs (DeBoer, Ho, Stump, & Breslow, 2014; Koller, Ng, Do, & Chen, 2013). The finding that most who register for MOOCs do not earn a certificate suggests intrinsic motivations to learn rather than extrinsic motivations for tangible

outcomes (DeBoer et al., 2014; Hara et al., 2013; Wilkowski, Deutsch, & Russell, 2014). The massive and open MOOC enrolments highlight a MOOC ideal that Illich (1970) foreshadowed almost half a century ago, *open learning and sharing for all*. Therefore, to gain insights regarding MOOC implementation and assessment, this study examines a recent US Department of State initiative, MOOC Camp, that aspires to Illich's ideal.

Hosted at public spaces globally, MOOC camp volunteers facilitate and help interested learners navigate a MOOC. The MOOC Camp model combines blended learning, using both online and offline learning (Bernard, Borokhovski, Schmid, Tamim, & Abrami, 2014; Garrison & Kanuka, 2004), and the flipped classroom whereby students review online material prior to discussing that material in a classroom (Forsey, Low, & Glance, 2013; Martin, 2012). In its first year, MOOC Camp hosted 4000 students in over 200 MOOCs across 65 locations. Unlike the 5–10 % completion rates, 40–60 % of the MOOC Camp learners completed a MOOC at most locations and over 80 % in some locations. Popular subjects were English language learning and teaching (60 %), and entrepreneurship and business (20 %).

This paper draws on the MOOC Camp model and utilises data gathered from the respective courses to gain insights about two primary issues: (1) MOOC implementation models for use in academia and industry (Daniel, 2012; Murphy et al., 2014); and (2) success measures for MOOC suppliers and users (Daniel, 2012; Jordan, 2014; Klobas et al., 2014). The paper also adds to the nascent research stream of MOOCs in hospitality and tourism.

## 2 Literature Review

### 2.1 MOOC Implementation Models

As with previous innovations touted to change education forever—such as the telephone, radio, television and Internet—Massive Open Online Courses (MOOCs) are taking the press and academia by storm (Daniel, 2012). MOOCs may be either the grandest of online endeavours due to their ability to enrol tens of thousands of students, for free, or mass failures due to the reported low completion rates and unknown business models. Yet MOOCs seem here to stay. Therefore a key concern for MOOC suppliers, such as academics and educational institutions, is if to adopt MOOCs and subsequently, how to implement and use MOOCs.

Similar to traditional classes, the hosting university bears all costs to design and run MOOCs. A survey of 108 professors with a median MOOC size of 33,000 students found that the typical professor invested over 100 h developing the MOOC and another 9 h weekly administering and managing the MOOC (Kolowich, 2013). At the University of Edinburgh, average instructor time across eight MOOCs of 5 weeks each was 240 h (MOOCs @ Edinburgh, 2013) and instructor time was



about 400 h for an 8-week MOOC at Duke University (Belanger & Thornton, 2013). These estimates omit other expenses such as staff support, infrastructure, video production and copyright clearance. With little obvious income, MOOC business models are a work in progress at best (Dellarocas & Van Alstyne, 2013).

As with prior communication technology innovations, MOOCs are too new for solid prognostications on their eventual implementation. One MOOC prediction is that half the US higher education institutions will disappear in a few decades, and Harvard will have ten million students (Harden, 2012). History suggests about 30 years for the eventual innovation use to emerge, as evidenced with the telegraph, telephone, radio, movies and television (Fidler, 1997). For example one popular early telephone prognostication, listening to live music concerts, never eventuated. Similarly, the hospitality industry's early websites often featured splash homepages with colourful animations, but this trend of requiring potential customers to sit through animations has waned (Hashim, Murphy, Olaru, & O'Connor, 2014).

## 2.2 *Diffusion of Innovations*

Comparable to past communication innovations, MOOCs should affect existing communication technologies and the communication environment (Fidler, 1997). And MOOCs may have already begun to change the educational communication environment, online and offline. The Diffusion of Innovations (DOI) framework, a popular theory of innovation adoption and implementation (Jeyaraj, Rottman, & Lacity, 2006; Rogers, 2003) helps support this contention.

Two key DOI distinctions are: (1) the level of diffusion; and (2) innovation adoption versus innovation implementation (Rogers, 2003). The level of diffusion helps identify the diversity among stakeholders across the MOOC landscape, such as individual MOOC participants and organisational MOOC suppliers. Innovation adoption versus implementation highlights the importance of successful innovation use (Fichman & Kemerer, 1999; Furuholt & Ørvik, 2006).

It seems every vice chancellor, provost or rector globally is considering MOOCs' impact on traditional education. Universities can jump on the MOOC bandwagon, or wait to see what evolves. Two effects, bandwagon and leapfrog, have opposite consequences on innovation adoption and implementation (Ismail, Hashim, Gemignani, & Murphy, 2012). Bandwagon effects, adopting an innovation quickly due to fad and fashion rather than reasoned decisions, often lead to poor innovation implementation (Abrahamson, 1991). Leapfrog effects relate to individuals, organisations or countries late to adopt an innovation, who advance quickly in innovation use (Goldenberg & Oreg, 2007; Rosenkranz, 1997; Wu, Mahajan, & Balasubramanian, 2003).

In addition to unknown MOOC business models, few MOOCs are a roaring success and some seem implementation failures. For example, the website for Cornell's School of Hospitality Administration's 3-week MOOC in 'New Media Marketing' seems to have disappeared. Georgia Tech cancelled their

'Fundamentals of Online Learning' MOOC mid-term and the lead professor for a University of California MOOC quit midway through the term (Murphy et al., 2014). Furthermore, most MOOCs have completion rates of less than 10 % of those who enrol, and an average completion rate of 6.5 % (Jordan, 2014). For organisations considering MOOCs, the adoption decision should come after deciding if successful MOOC implementation is possible, and relevant success measures for implementing that MOOC.

### 2.3 *MOOC Success Measures*

MOOC participation, which reflects success at both the individual/user and organisational/supplier level, typically describe a participation funnel that begins with raw enrolment and then shrinks based on engagement (Jordan, 2014; Klobas et al., 2014). From one-half to two-thirds of MOOC registrants continue beyond registration, less participate in activities and eventually under one in ten earns a certificate of participation (Jordan, 2014; Murphy et al., 2013).

In most MOOCs, anyone who completes course requirements and achieves a minimum mark, from 40 to 80 %, receives a certificate of completion from host institutions such as Duke, Harvard, Google, MIT, Stanford, and the University of Edinburgh (Belanger & Thornton, 2013; Breslow et al., 2013; MOOCs @ Edinburgh, 2013; Wilkowski et al., 2014). Coursera, a Stanford spin-off MOOC provider, and other providers offer verified certificates in some courses for a fee from US\$30 to 90 [[coursera.org/signature/guidebook](https://www.coursera.org/signature/guidebook)]. Coursera affirms the learner's identity and links to a verified certificate on a unique, secure URL on the Coursera site.

High MOOC enrolments are typical, particularly as MOOCs are free and often from elite universities. However, the findings that most who register for MOOCs do not engage with the course material or drop out shortly after enrolling reflects intrinsic motivations to learn a particular topic rather than extrinsic motivations to complete the MOOC and earn a certificate (DeBoer et al., 2014; Hara et al., 2013; Wilkowski et al., 2014). Self-efficacy, goal setting and persistence motivate intrinsic learners (Bandura, 1977); intrinsic motivation seems a key driver of MOOC enrolments (Daniel, 2012).

Yet with only 5–10 % of registrants earning a certificate (Jordan, 2014), critics argue that MOOCs are a failure (Dolan, 2014). Others counter that this declaration of failure draws on a traditional academic notion of attendance and completion, and thus, is an inappropriate means for assessing MOOCs (DeBoer et al., 2014; Koller et al., 2013).

Hundreds of thousands of learners, many without access to traditional university education, accessing a Harvard, MIT or Stanford MOOC seems a stunning success (Pappano, 2012). Andrew Ng, who built and taught Stanford's inaugural MOOC, estimated that to reach the 150,000+ students in his MOOC would take 250 years in his traditional class (Friedman, 2012). Furthermore, there is no known correlation

between course dropout rates and failure of the MOOC ideal of open education to all (Dolan, 2014).

Critics that disparage MOOCs' low completion rates may ignore that completion is a traditional education measure. MOOC enrollees have diverse motivations, such as gaining knowledge and skill, rather than MOOC completion (Breslow et al., 2013; DeBoer et al., 2014; Koller et al., 2013; Wilkowski et al., 2014). For example, about 80 % of those in the University of Central Florida's Tourism Industry Analysis enrolled in the MOOC to learn about the subject, half wanted skills for a career opportunity and just one in five wanted a certificate (Hara et al., 2013). Individual goal setting, a critical motivation skill (Bandura, 1977), associates positively with MOOC completion rates (Cisel, 2014).

Defining MOOC failure or success remains a tricky issue, in general and in hospitality and tourism (Horton-Tognazzini, Murphy, Tracey, & Hara, 2015; Reich & Ho, 2014). Yet establishing relevant success measures is critical to organisations adopting and subsequently implementing MOOCs. The US Department of State MOOC Camp initiative, which facilitates existing MOOCs rather than building and managing a MOOC, provides promising insights on success measures and a clever implementation model for academia and industry.

### 3 Methodology and Results

After finishing the US Department of State MOOC camp, facilitators in 13 countries asked participants to complete an optional online survey, with 13 attitudinal, 5 demographic and 1 outcome—earned a certificate—variables. Gender, university student and earned a certificate were binomial responses. The other variables were ordinal responses, usually on a five-point scale. Three variables provided dependent measures of MOOC success: *earned a certificate*, *would enjoy taking more MOOCs* and *learned a great deal*. The first two variables suggest, respectively, extrinsic and intrinsic motivations. The third variable reflects a fundamental educational goal, i.e., learners learn.

Given the first time administering the MOOC camp and privacy concerns, it was impossible to calculate the response rate accurately; a rough estimate is 10 %. And, as the survey was administered after the MOOC camp finished, the results omit participants who did not complete the MOOC camp. Finally, data cleaning reduced the survey cases from 154 to 149. Of the final cases, 71 % earned a certificate, 55 % had a bachelor degree or higher, 43 % were university students, 43 % were under 24 and 54 % were female. The demographic data falls within the general range of MOOC studies albeit slightly skewed towards university students, young participants and female participants (Ho et al., 2015; Jordan, 2014).

Responses to most ordinal variables were overwhelmingly positive, with over 80 % answering either strongly agree or agree. This distribution necessitated collapsing two dependent variables—*would enjoy taking more MOOCs* and *learned a great deal*—into binomial variables, strongly agree and other, to perform logistic

**Table 1** Logistic regression results

Dependent variable	Chi-square	p	df	Nagelkerke R <sup>2</sup>	Classification %
Learned a great deal	50.909	<0.001	17	0.456	78.7
Enjoy taking more MOOCs	88.703	<0.001	17	0.756	92.6
Earned a certificate	31.997	0.015	17	0.408	80.3

regression on these variables. Logistic regression, rather than regression, has no normal distribution assumption and works well with ordinal variables predicting a binomial dependent variable (Hair, Black, Babin, Anderson, & Tatham, 2006).

Tables 1 below shows the results of three logistic regressions that significantly predicted: learned a great deal ( $p < 0.001$ ), would enjoy taking more MOOCs ( $p < 0.001$ ) and earned a certificate ( $p < 0.015$ ). The regressions ran on the 122 cases with responses to all variables, rather than the original 149 cases. Table 2 below shows the predictor variables grouped into three categories: MOOC format, Facilitation and Demographics. Table 2, and the regressions, also include the three dependent variables as predictors of the other two dependent variables.

The results show that neither *learned a great deal* nor *enjoy taking more MOOCs* predicted *earned a certificate*, a common MOOC success measure. Nor did *earned a certificate* predict *learned a great deal*. For university students, however, *earned a certificate* did predict *enjoy taking more MOOCs*. The other two dependent variables related strongly as *learned a great deal* predicted *enjoy taking more MOOCs* and vice versa. Only one variable, *enjoy taking more MOOCs*, predicted *learned a great deal*.

Five variables, in addition to *learned a great deal* and *university students that earned a certificate*, predicted *enjoy taking more MOOCs*. Two variables, *could find the materials* and *appropriate text*, were MOOC format variables. One facilitation variable, *participation valued*, and two demographic variables—*age group (youth)* and *English knowledge*—predicted *enjoy taking more MOOCs*.

Finally, three variables predicted *earned a certificate*. Two of these variables, *participation valued* and *face-to-face discussions helped*, were facilitation variables. The third variable that predicted earned a certificate was a demographic characteristic, *male university students*.

## 4 Discussion

Despite the limitations of a small, convenience sample, this exploratory study provides new insights regarding MOOC implementation and assessment. In terms of implementation, the results highlight the importance of design features that make it easy for participants to access and use the course materials, as well as facilitation that reinforces participant engagement.

These findings are consistent with evidence from the training and education literatures, which shows that the quality of course materials and instructor or peer

**Table 2** Predictor variables

	Predictor variable	Predicted outcome						
		Learned a great deal		Enjoy taking more MOOCs		Earned a certificate		
		p	Exp (B)	p	Exp (B)	p	Exp (B)	
Dependent outcome	Learned a great deal			0.007	14.625	0.188	1.888	
	Enjoy taking more MOOCs	0.009	6.586			0.881	0.917	
	Earned a certificate	0.422	0.619					
MOOC format	English skills strong enough	0.843	0.903	0.381	1.978	0.118	0.443	
	Computer skills strong enough	0.114	1.967	0.094	3.388	0.368	1.422	
	Could find the material	0.146	1.706	0.009	0.106	0.418	0.725	
	Course pace	0.565	1.253	0.480	1.490	0.643	1.210	
	Appropriate text	0.201	1.738	0.011	14.835	0.229	0.522	
	Facilitation	Facilitated discussions attended	0.276	1.376	0.914	1.058	0.309	0.742
		Sufficient feedback	0.365	1.306	0.440	1.642	0.741	0.895
	Facilitator communication	0.699	1.166	0.361	0.504	0.355	0.690	
	Participation valued	0.739	0.879	0.018	6.122	0.012	2.631	
	Face to face discussions helped	0.621	1.244	0.292	0.576	0.001	5.607	
	Facilitator was valuable	0.437	0.678	0.626	0.680	0.073	0.392	
Demographic	Highest education	0.861	0.948	0.245	0.536	0.774	1.094	
	Age group	0.887	0.955	0.025	5.152	0.997	0.999	
	English knowledge level	0.435	1.484	0.045	0.115	0.054	0.340	
	Gender	0.954	1.030	0.325	2.629			
	University student	0.839	0.901					
		Certificate by University student			0.014	16.179		
		Gender (male) by University student					0.010	0.097

facilitation, among many other design features, can have a direct impact on an individual's motivation to learn and pursue continuous learning efforts (cf., Aguinis & Kraiger, 2009). Thus, it appears that a MOOC learning environment that provides participants: (a) user-friendly interfaces for acquiring and utilising all course resources; (b) an appropriate text and (c) multiple opportunities for instructor- and peer-based interactions, are three fundamental design requirements for effective MOOC implementation.

The current findings also complement those from studies that have demonstrated the utility of design features such as opportunities for practice and feedback (e.g., Donovan & Radosevich, 1999) and active learning (e.g., Silberman & Auerbach, 2006). In the current study, the blended MOOCs offered participants complete

access to the course materials throughout the duration of the course. This feature allowed students to review and re-review all course asset—videos, posts, articles, etc.—on a continuous basis. In addition, both online and offline discussion forums provided participants with multiple opportunities to interact, ask questions, and share ideas.

These design elements may have been salient contributors to the high completion rates among participants in the MOOCs examined in the current study. Of course, additional study should continue to identify the range and types of design factors that are fundamental to engaging intrinsically motivated participants.

In terms of MOOC assessment, the findings from this investigation underscore the importance of, and differences in, MOOC success measures. If the key MOOC success variable is certification, facilitation is critical and the best results will be with male university students. Yet academic and media attention on certificates seems secondary to learning. Earning a certificate was an insignificant predictor of learning. Similarly, learning was an insignificant predictor of earning a certificate. MOOC designers and instructors should consider two additional MOOC success measures, how much participants learned and if they would enjoy taking additional MOOCs.

If certification is a secondary (or perhaps irrelevant) priority for most MOOC participants, then additional consideration should be on criteria that can assess MOOC effectiveness. Most evaluation models to assess workplace training and development initiatives (e.g., Kirkpatrick, 1967) focus on participant perceptions as an immediate and primary outcome for training success. For example, Alliger, Tannenbaum, Bennett, Traver, and Shotland's (1997) meta-analysis showed that utility-based perceptions, which focus on the personal or professional relevance of the learning experience, were significant predictors of learning, retention and behaviour/skill demonstration.

Evidence of a significant relationship between utility reactions and learning is compelling (e.g., Alliger et al., 1997). However, while the direct link between affective reactions and learning has not been supported, subsequent research has shown that affective reactions relate significantly to post-training motivation and self-efficacy (e.g., Sitzmann, Casper, Brown, Ely, & Zimmerman, 2008), and that post-training motivation and self-efficacy link directly to learning (e.g., Tai, 2006). Thus, the link between affective reactions and learning is indirect (i.e., mediated by post-training motivation and self-efficacy).

In this study, the relationship was significant between learning and an affective-based perception, participant enjoyment of the learning experience. Future research should consider other types of participant reactions and the relationships among these core outcomes that are relevant to MOOC settings.

For example, consideration could be given to the research on self-efficacy, goal setting, persistence, and reciprocal interaction (Bandura, 1977, 1978; Cisel, 2014), as some of these motivational variables have been shown to influence trainee reactions and learning (e.g., Tracey, Hinkin, Tannenbaum, & Mathieu, 2001). Moreover, as noted above, it would be useful to consider the impact of integrating design features such as community forums and peer assessment to enhance

participant motivation, engagement, and satisfaction. Finally, future research could compare affective and motivational responses across xMOOCs, which focus on knowledge duplication, and cMOOCs, which focus on knowledge creation (Klobas et al., 2014).

From a practical standpoint, educational institutions and hospitality/tourism organisations can use these preliminary results as a foundation for implementing blended MOOCs and facilitating student and employee MOOC efforts with complementary face-to-face discussions. The Department of State has a two-page guide with clear recommendations for using blended MOOCs, including preparing the participants, structuring discussions, hosting enrichment activities, building community and turning content into action (Bureau of Educational and Cultural Affairs, 2015). These resources can apply in almost any environment to amend existing or create new learning opportunities.

In sum, this study provided new insights about two key MOOC challenges. While concerns regarding MOOC administration and completion rates are certainly relevant, the identified design and facilitation features provide a good starting point for designing and implementing future MOOCs that enhance participant engagement and promote continuous learning. The authors hope that the current findings stimulate others to look closely at the variables that contribute to effective MOOC design and implementation, as well as evaluation criteria that may be unique to MOOC users and suppliers.

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## References

- Abrahamson, E. (1991). Managerial fads and fashions: The diffusion and rejection of innovations. *Academy of Management Review*, 16(3), 586–612.
- Aguinis, H., & Kraiger, K. (2009). Benefits of training and development for individuals, teams, organizations, and society. *Annual Review of Psychology*, 60, 451–474.
- Alliger, G. M., Tannenbaum, S. I., Bennett, W., Jr., Traver, H., & Shotland, A. (1997). A meta-analysis of the relations among training criteria. *Personnel Psychology*, 50(2), 341–358.
- Bandura, A. (1977). Self-efficacy: Toward a Unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215.
- Bandura, A. (1978). The self system in reciprocal determinism. *American Psychologist*, 33(4), 344–358.
- Belanger, Y., & Thornton, J. (2013). *Bioelectricity: A quantitative approach*. Durham, NC: Duke University.
- Bernard, R. M., Borokhovski, E., Schmid, R. F., Tamim, R. M., & Abrami, P. C. (2014). A meta-analysis of blended learning and technology use in higher education: From the general to the applied. *Journal of Computing in Higher Education*, 26(1), 87–122.



- Breslow, L., Pritchard, D., DeBoer, J., Stump, G., Ho, A., & Seaton, D. (2013). Studying learning in the worldwide classroom—Research into edX's first MOOC. *Research & Practice in Assessment*, 8(Summer), 13–25.
- Bureau of Educational and Cultural Affairs. (2015). *MOOC camp guide for facilitators*. Washington, DC. Retrieved from [http://eca.state.gov/files/bureau/mooc\\_camp\\_guide\\_facilitators.pdf](http://eca.state.gov/files/bureau/mooc_camp_guide_facilitators.pdf)
- Cisel, M. (2014). *Analysing completion rates in the First French xMOOC*. Paper presented at the European MOOCs Stakeholders Summit, Lausanne, Switzerland, pp. 26–32.
- Cuffy, V., Tribe, J., & Airey, D. (2012). Lifelong learning for tourism. *Annals of Tourism Research*, 39(3), 1402–1424.
- Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education*, 3.
- Deale, C. S. (2015). An exploratory study of hospitality and tourism educators' use and perceptions of MOOCs. *Journal of Teaching in Travel & Tourism*, 15(2), 150–165.
- DeBoer, J., Ho, A. D., Stump, G. S., & Breslow, L. (2014). Changing “Course”: Reconceptualising educational variables for massive open online courses. *Educational Researcher*, 43(2), 74–84.
- Dellarocas, C., & Van Alstyne, M. (2013). Money models for MOOCs. *Communications of the ACM*, 56(8), 25–28.
- Dolan, V. L. B. (2014). Massive online obsessive compulsion: What are they saying out there about the latest phenomenon in higher education? *The International Review of Research in Open and Distance Learning*, 15(2), 268–280.
- Donovan, J. J., & Radosevich, D. J. (1999). A meta-analytic review of the distribution of practice effect: Now you see it, now you don't. *Journal of Applied Psychology*, 84(5), 795–805.
- European Commission. (2015). *Open education scoreboard—MOOCs growth*. Retrieved April 14, 2015, from [http://openeducationeuropa.eu/en/european\\_scoreboard\\_moocs](http://openeducationeuropa.eu/en/european_scoreboard_moocs)
- Fichman, R. G., & Kemerer, C. F. (1999). The illusory diffusion of innovation: An examination of assimilation gaps. *Information Systems Research*, 10(3), 255–275.
- Fidler, R. F. (1997). *Mediamorphosis—Understanding new media*. Thousand Oaks, CA: Pine Forge Press.
- Forsey, M., Low, M., & Glance, D. (2013). Flipping the sociology classroom: Towards a practice of online pedagogy. *Journal of Sociology*, 49(4), 471–485.
- Friedman, T. L. (2012, May 15). Come the revolution. *The New York Times*. [www.topics.nytimes.com/top/opinion/editorialsandoped/oped/thomasfriedman/index.html](http://www.topics.nytimes.com/top/opinion/editorialsandoped/oped/thomasfriedman/index.html)
- Furuholt, B. R., & Ørvik, T. U. (2006). Implementation of information technology in Africa: Understanding and explaining the results of ten years of implementation effort in a Tanzanian organization. *Information Technology for Development*, 12(1), 45–62.
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2), 95–105.
- Goldenberg, J., & Oreg, S. (2007). Laggards in disguise: Resistance to adopt and the leapfrogging effect. *Technological Forecasting and Social Change*, 74(8), 1272–1281.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Prentice Hall.
- Hara, T., Moskal, P., & Saarinen, C. (2013). *Preliminary analyses of a cutting-edge knowledge distribution method of MOOC (Massive, Open, Online Course) to teach tourism as an industry*. Paper presented at the 3rd International Conference on the Measurement and Economic Analysis of Regional Tourism, Medellin, Colombia.
- Harden, N. (2012). The end of the university as we know it. *The American Interest*, p. 8. [www.the-american-interest.com/2012/12/11/the-end-of-the-university-as-we-know-it/](http://www.the-american-interest.com/2012/12/11/the-end-of-the-university-as-we-know-it/)
- Hashim, N. H., Murphy, J., Olaru, D., & O'Connor, P. (2014). Bandwagon and leapfrog effects in Internet implementation. *International Journal of Hospitality Management*, 37(1), 91–98.
- Ho, A. D., Chuang, I., Reich, J., Coleman, C., Whitehill, J., Northcutt, C. G., et al. (2015). HarvardX and MITx: Two years of open online courses HarvardX Working Paper (No. 10).



- Horton-Tognazzini, L., Murphy, J., Tracey, J. B., & Hara, T. (2015). *MOOCs: The ideal taking off in tourism*. Paper presented at the 13th APacCHRIE Conference, Auckland, NZ.
- Horton-Tognazzini, L., Ryan, P., & Williams, A. (2015). *A snapshot of MOOCs in hospitality and tourism*. Paper presented at the 13th APacCHRIE Conference, Auckland, NZ.
- Illich, I. (1970). Learning webs. In I. Illich (Ed.), *Deschooling society*. New York: Harper & Row.
- Ismail, A. F., Hashim, N. H., Gemignani, G., & Murphy, J. (2012). Leapfrogging and Internet implementation by tourism organizations. *Journal of Information Technology and Tourism*, 13(3), 177–189.
- Jeyaraj, A., Rottman, J., & Lacity, M. (2006). A Review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21(1), 1–23.
- Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *The International Review of Research in Open and Distance Learning*, 15(1), 133–159.
- Kirkpatrick, D. L. (1967). Evaluation of training. In R. L. Craig & L. R. Bittel (Eds.), *Training and development handbook* (pp. 87–112). New York: McGraw-Hill.
- Klobas, J. E., Mackintosh, B., & Murphy, J. (2014). The anatomy of MOOCs. In P. Kim (Ed.), *Massive open online courses: The MOOC revolution (Chapter 1)*. New York: Routledge.
- Koller, D., Ng, A., Do, C., & Chen, Z. (2013). Retention and intention in massive open online courses. *Educause Review*, p. 48. <http://www.educause.edu/ero/article/retention-and-intention-massive-open-online-courses-depth-0>
- Kolowich, S. (2013, March, 24). The professors who make the MOOCs. *Chronicle of Higher Education*. <http://chronicle.com/article/The-Professors-Behind-theMOOC/137905/#id=overview>
- Martin, F. G. (2012). Will massive open online courses change how we teach? *Communications of the ACM*, 55(8), 26–28.
- MOOCs @ Edinburgh. (2013). *MOOCs @ Edinburgh* (Vol. 1). Edinburgh: University of Edinburgh.
- Murphy, J., Hofacker, C., Brogan, P., & Kim, P. (2013). *Massive open online courses: A MOOC overview and research agenda*. In American Marketing Association Summer Educators' Conference, Boston.
- Murphy, J., Kalbaska, N., Williams, A., Ryan, P., Cantoni, L., & Horton-Tognazzini, L. (2014). Massive open online courses: Strategies and research areas. *Journal of Hospitality and Tourism Education*, 26(1), 39–43.
- Pappano, L. (2012, November 2). Year of the MOOC. *The New York Times*. [www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html](http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html)
- Radford, A. W., Robles, J., Cataylo, S., Horn, L., Thornton, J., & Whitfield, K. E. (2014). The employer potential of MOOCs: A mixed-methods study of human resource professionals' thinking on MOOCs. *The International Review of Research in Open and Distance Learning*, 15(5), 1–25.
- Reich, J., & Ho, A. (2014). *The tricky task of figuring out what makes a MOOC successful*. The Atlantic. Available at: <http://www.theatlantic.com/education/archive/2014/01/the-tricky-task-of-figuring-out-what-makes-a-mooc-successful/283274/>
- Rodríguez-Antón, J. M., Alonso-Almeida, M. M., Andrada, L. R., & Pedroche, M. C. (2013). Are university tourism programmes preparing the professionals the tourist industry needs? A longitudinal study. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 12(1), 25–35.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Simon & Schuster.
- Rosenkranz, S. (1997). Quality improvements and the incentive to leapfrog. *International Journal of Industrial Organization*, 15(2), 243–261.
- Silberman, M., & Auerbach, C. A. (2006). *Active training: A handbook of techniques, designs, case examples, and tips* (3rd ed.). San Francisco: Jossey-Bass/Pfeiffer.
- Sitzmann, T., Casper, W. J., Brown, K. G., Ely, K., & Zimmerman, R. D. (2008). A review and meta-analysis of the nomological network of trainee reactions. *Journal of Applied Psychology*, 93(2), 280–295.

- Tai, W. (2006). Effects of training framing, general self-efficacy and training motivation on trainees' training effectiveness. *Personnel Review*, 35(1), 51–65.
- Tracey, J. B., Hinkin, T. R., Tannenbaum, S. I., & Mathieu, J. E. (2001). The influence of individual characteristics and the work environment on varying levels of training outcomes. *Human Resource Development Quarterly*, 12(1), 5–23.
- Wilkowski, J., Deutsch, A., & Russell, D. M. (2014). *Student skill and goal achievement in the mapping with Google MOOC*. Paper presented at the first ACM conference on Learning@scale conference. Atlanta, GA: ACM.
- Wu, F., Mahajan, V., & Balasubramanian, S. (2003). An analysis of e-business adoption and its impact on business performance. *Journal of the Academy of Marketing Science*, 31(4), 425–447.

# A Framework for Evaluating MOOCs in Applied Hospitality and Tourism Settings

J. Bruce Tracey, Jamie Murphy, and Laurel Horton-Tognazzini

**Abstract** This paper presents an evaluation framework for examining the use and utility of massive, open, online courses (MOOCs) for applied hospitality and tourism work settings. We contend that the growth of MOOCs provides several opportunities for companies to expand their training and development efforts, and that MOOCs can support a wide array of learning initiatives that promote engagement, continuous improvement, and professional growth. However, while traditional models can evaluate impact, several unique features associated with MOOCs necessitate a broader and more contextually specific evaluation scheme. As such, this proposed framework considers those content and design features that are particularly relevant to MOOCs, and identifies additional criteria that can evaluate the current and future utility of this unique learning platform.

**Keywords** MOOC • Online learning • Evaluation framework

## 1 Introductions

With faster adoption than any prior product or technology, including Facebook, Massive Open Online Courses (MOOCs) illustrate a global hunger for new learning content and methods (Lewin, 2013; Ng, 2013). Over 150,000 learners enrolled in Stanford University and Massachusetts Institute of Technology (MIT)'s initial 2011 MOOC offerings. In addition, since offering its first course in 2013, Wesleyan College MOOCs have passed one million registrants (Rubenstein, 2015). In the hospitality domain, several institutions have developed courses for a wide range of industry-specific topics, from Università della Svizzera italiana's etourism communication perspectives course to the University of Central Florida's course on tourism analysis (please see Table 1 later). Beyond the massive numbers, MOOCs' revolutionary aspect is the technical ability to provide online learners

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**Table 1** Tourism and hospitality MOOCs

Provider	Course	Latest offer	Weeks	Language
Alison	<i>Tourism—Marketing and Promotion</i>	2015	Self-paced	English
Alison	<i>English for Tourism—Restaurant Service</i>	2015	Self-paced	English
Alison	<i>English for Tourism—Tourist Information and Guided Tours</i>	2015	Self-paced	English
Alison	<i>Introduction to the Development of the Tourism Industry</i>	2015	Self-paced	English
Alison	<i>Tourism—Introduction to Retail Travel Sales</i>	2015	Self-paced	English
Alison	<i>Tourism—Introduction to Travel Patterns and Destinations</i>	2015	Self-paced	English
Alison	<i>Tourism Industry—Sectors and Career Development</i>	2015	Self-paced	English
Alison	<i>English for Tourism - Hotel Reception and Front Desk</i>	2015	Self-paced	English
Cornell University	<i>Introduction to Global Hospitality Management</i>	02/15	6	English
Escuela de Organización Industrial y l'Ajuntament de Benissa	<i>Innovación en Turismo Cultural</i>	2014	8	Spanish
Harvard	<i>Science and Cooking: From Haute Cuisine to the Science of Soft Matter</i>	06/15	13	English
Taylor's University	<i>Wonderful Styles of Food &amp; Beverage around the World</i>	05/14	5	English
Taylor's University	<i>Introduction to Wines 101</i>	09/14	14	English
The New School	<i>Writing American Food</i>	05/15	6	English
Università Bocconi	<i>Managing Food &amp; Beverage Companies</i>	07/15	4	English
Università della Svizzera italiana	<i>eTourism Communication Perspectives</i>	10/15	8	English
Università Telematica Intemazionale	<i>Statistics and Economic Statistics of Tourism</i>	2015	Self-paced	Arabic, English, Italian
Universitat de Girona	<i>Cambios en el Turismo Contemporaneo</i>	03/14	7	Spanish
Université de Jendouba et l'Université Toulouse—Jean Jaurès	<i>L'écotourisme: Imaginons-le ensemble</i>	06/15	7	French
University of Central Florida	<i>Tourism Industry Analysis</i>	04/15	6	English
University of Central Florida	<i>Hospitality Financial Management</i>	10/15		English

with free and open access to quality higher education courses (Grimmelmann, 2014).

MOOCs also align with important educational gaps in applied settings. Many firms are unable to meet the most basic learning and development needs of their employees (Tessler, Bangser, Pennington, Schaberg, & Dalporto, 2014). Thus, the opportunity to utilise content that is available in the public domain is clearly appealing. While only a handful of companies have formally integrated MOOCs into their corporate learning systems (Walsh, 2015), momentum is building. For example, a recent survey of 103 human resource management professionals by Radford et al. (2014) indicated that only 7 % have used MOOCs to help promote professional development among their employees. However, 75 % reported that they have considered or could see their companies using MOOCs for developmental purposes in the near future.

Moreover, MOOCs address two growing educational trends that employers, academia, and learners alike have acknowledged—the importance of different learning styles and lifelong education (Cuffy, Tribe, & Airey, 2012; Radford et al., 2014; Rodríguez-Antón, Alonso-Almeida, Andrada, & Pedroche, 2013; Sizoo, Agrusa, & Iskat, 2005). Since MOOCs generally incorporate myriad design and content features, they can accommodate a wide range of learning styles. And because they are founded on the open, free access ideal, MOOCs promote continuous learning opportunities, especially for those with limited access.

If human resource and learning executives determine that MOOCs play an important role in supporting the training needs of their staff, then a key consideration is the evaluation of MOOC effectiveness and utility. While enrolments and completion rates provide some indication of effectiveness, additional criteria merit consideration for understanding the value of this emerging learning platform.

This paper presents an overview of the roles and relevance of MOOCs for applied hospitality and tourism settings, and promotes a comprehensive evaluation framework for evaluating MOOCs. We begin by presenting an overview of MOOCs and their evolution since inception. Then, we propose an evaluation model that integrates traditional learning criteria with those that are more specific and unique to MOOCs.

## 2 Literature Review

### 2.1 Overview of MOOCs

For this paper, we define MOOCs as open courses—no participant fees, no pre-requisites nor required activities—that provide participation feedback, recognition and the capacity for thousands of learners (Murphy, Kalbaska, Horton-Tognazzini, & Cantoni, 2015). As noted above, the content of MOOCs varies widely across activities such as videos, readings, group work, homework, peer

evaluation, self-evaluation, wikis, written projects, tests, and online forums. Courses are generally over a 4–8 week period, and the participants engage in the course material at their own pace.

The University of Manitoba launched the first MOOC in 2008, “Connectivism and Connective Knowledge,” which hosted 25 fee-paying traditional students and 2200 non-fee-paying online students (Daniel, 2012). MOOCs’ massive enrolments began in 2011 when MIT and Stanford enrolled 150,000+ students in a sole MOOC (Daniel, 2012; Lewin, 2013). These sizable enrolment numbers were due to the fact that the courses were marketed well and “genuinely open to all comers” (Grimmelmann, 2014, p. 8).

MOOCs are evolving from two prototypes, connectivist (cMOOCs) and extended (xMOOCs), and include hybrids across these prototypes and other pedagogies (Daniel, 2012; Klobas, Mackintosh, & Murphy, 2014). The pedagogy of cMOOCs stems from the notion that knowledge is created and shared across a network of connections. That is, learning is the formation of connections made within networks (Downes, 2011).

In contrast, xMOOCs, which emerged from Stanford and MIT, use traditional cognitive-behaviorist learning and knowledge duplication pedagogy (Daniel, 2012; Klobas et al., 2014). In general, xMOOCs use short videos or text to present key concepts, followed by a series of activities and resources that help reinforce the content, and then quizzes to determine if the fundamental concepts are understood. With their massive 150,000+ enrolments, xMOOCs astounded the media and academia, culminating in The New York Times pronouncing 2012 as “The Year of The MOOC” (Pappano, 2012). Most MOOCs today are xMOOCs (Daniel, 2012; Klobas et al., 2014), including those for the hospitality and tourism industry.

## ***2.2 Using MOOCs in Applied Settings***

Although MOOCs have only recently emerged in the online education space, this platform has substantial potential to augment company-sponsored training and development activities. A recent Training magazine article reported that a great deal of MOOC content is already available and can be integrated quite easily into existing training efforts (Weinstein, 2014). For example, companies can direct new employees to complete MOOCs as part of an on-boarding program, or integrate MOOCs into development programs that are designed to prepare individuals to take on greater responsibilities (e.g., promotion). Moreover, MOOCs can serve the learning needs of audiences worldwide. Thus, MOOCs not only serve as a key complement to existing training and development efforts, but this type of platform also “gives training a longer retention period and...allows organizations to expand their bandwidth” (Weinstein, 2014, p. 26).

In addition to providing firms with global distribution of learning content, MOOCs offer an important complement to instructor-led approaches by promoting a highly flexible approach to learning. As noted above, the assets embedded within

many recent MOOCs provide a wide-array of learning options—from watching videos and reading reference materials, to engaging in instructor-led discussions and participating in peer-evaluation processes. And while there is some evidence which shows that some types of learning styles may be more effective than others for online learning (e.g., Rogers, 2011), the diversity of MOOCs' learning options and features should address the needs of most online learners.

Another key flexibility aspect is the ability to pick-and-choose content for addressing a company's specific learning and development needs. Indeed, the delivery platform allows, and even promotes, the content to be re-purposed and utilised as broadly as imaginable. As such, companies can select and integrate information and materials that are most relevant for facilitating employee learning and growth.

Moreover, the evolution of new technologies will enable even more applications. For example, a 2014 Research Markets report [[researchandmarkets.com/research/v2rv6v/global\\_elearning](http://researchandmarkets.com/research/v2rv6v/global_elearning)] predicts that the global e-learning market will grow 15 % between 2015 and 2019, with much of the increase due to tablet use and other mobile learning devices that utilise internet-enabled SaaS (i.e., “software as a service”) platforms that require little to no setup by the user. Thus, organisations can provide learning opportunities on a subscription basis, which creates an on-demand solution and does not require the company to invest in a particular kind of software to support an online learning system.

When companies decide to incorporate online learning or MOOCs into the overall learning system, careful consideration should be given to the evaluation process, particularly the criteria, for evaluating utility. Traditional indices that focus on employee reactions and learning (e.g., Kirkpatrick, 1967) can certainly evaluate MOOCs. However, some of the effectiveness indicators require modification to account for some of MOOCs' unique design features. In addition, we contend that market-oriented indices regarding supply and demand of MOOCs can provide an indication of utility, and thus, is strategically useful for making decisions about future learning and development opportunities.

### 3 Evaluating MOOCs

While enrolment numbers provide one indicator of MOOC success, pundits and prognosticators have expressed substantive concerns about MOOCs' low completion rates, around 5–10 %. Those who have studied MOOC enrolments typically describe a participation funnel (Jordan, 2014; Murphy et al., 2016). The funnel begins with raw enrolment and then shrinks based on engagement. From one-half to two-thirds of MOOC participants continue beyond registration, less participate in activities and eventually under one in ten earns a certificate of participation (Jordan, 2014; Murphy et al., 2016).

However, while critics disparage MOOCs' low completion rates, they seem to ignore that completion is a traditional education measure. As noted above, MOOC

enrollees have diverse motivations, such as gaining new knowledge that may have personal relevance, or completing a course because it may have potential career-related benefits (Breslow et al., 2013; DeBoer, Ho, Stump, & Breslow, 2014; Wilkowski, Deutsch, & Russell, 2014). For example, about 80 % of those in the University of Central Florida's course, "Tourism Industry Analysis," enrolled because they had a general interest in learning about the subject, whereas half wanted skills for a career opportunity; only one in five participated to earn a certificate (Hara, Moskal, & Saarinen, 2013). This typical funnel of participation highlights that intrinsic motivation to learn rather than extrinsic motivation to gain a certificate drive MOOC participants (Daniel, 2012). In light of the variance in motivations, defining MOOC failure or success from an applied completion standpoint is a tricky issue (Murphy et al., 2014; Reich & Ho, 2014).

### ***3.1 Kirkpatrick's Evaluation Framework***

Traditional industry approaches to evaluation involve a formal process of gathering information to determine if the learning and program objectives have been met. The most popular evaluation framework, Kirkpatrick (1967, 1994), includes four criteria that can be applied to most any learning and development effort. The first or level 1 criterion is trainee reactions, which refers to an individual's affective responses to attending a focal training program. The second or level 2 criterion is learning. This outcome examines the extent to which individuals acquire the knowledge acquired during the training experience. The third or level 3 criterion, behavior, reflects the extent to which individuals apply or transfer the knowledge, behaviors and/or skills addressed in the focal program. The fourth or level 4 criterion is results, which indicates the extent to which the focal training program positively influenced aggregate measures of unit or company performance (e.g., sales growth, operational efficiency, customer satisfaction, etc.). While inconclusive, some evidence suggests a hierarchical relationship among these criteria (e.g., reactions lead to learning, learning leads to behavior, and behavior leads to results; cf. Alliger, Tannenbaum, Bennett, Traver, & Shotland, 1997).

Most training evaluation research has focused on the extent to which firms use the aforementioned criteria for examining the utility of training initiatives. Overall, studies have shown that much more emphasis is on the first two criteria, reactions and learning. Albeit, efforts have been taken to examine behavioral transfer and organisational-level impact (e.g., Kraiger, Ford, & Salas, 1993; Tracey, Tannenbaum, & Kavanagh, 1995). However, while these criteria may be useful for examining any type of learning activity, including MOOCs, careful consideration should be given to operationalising the effectiveness indicators.

Regarding level 1, most MOOCs embed surveys to consider two types of participant reactions, affective responses (e.g., extent to which participants enjoyed the learning experience) and utility responses (e.g., extent to which participants thought the experience was useful to their growth and development). These



dimensions are typical of most level 1 evaluation strategies (cf., Alliger et al., 1997). However, as noted above, intrinsic motivation and open access may be key drivers of MOOC enrolments (Daniel, 2012). Thus, we propose that self-efficacy beliefs (Bandura, 1977), a critical motivational construct, is an important level 1 criterion that should be included in MOOC evaluations. This is particularly relevant from an applied standpoint because self-efficacy beliefs have been shown to be significantly related to individual performance (e.g., Sitzmann & Yeo, 2013), job satisfaction (e.g., Judge & Bono, 2001), career decisions (e.g., Choi et al., 2012), and many other important work-related variables.

The evaluation of level 2 outcomes is in much the same manner as level 1. Surveys are generally integrated into the course design, and participants receive immediate feedback upon completion. The primary focus of most MOOC level 2 evaluations appears to be declarative knowledge, which reflects the extent to which individuals may have acquired an understanding of fundamental concepts (Kraiger et al., 1993). While this is appropriate and desirable, additional consideration should be given to higher levels of learning (e.g., meta-cognitive skills) that addresses the integration and application of learned concepts. This type of criterion can be examined using similar survey tools, as well as through an analysis of open-ended, qualitative information (e.g., responses to case study questions). In this case, content analysers can be programmed to examine key words and themes to identify the extent to which additional knowledge and cognitive skills may have been acquired.

Consistent with the trends noted above, evaluating level 3 and 4 outcomes are more difficult than the other two levels, particularly for MOOCs. One way to evaluate level 3, the extent to which individuals apply their newly acquired knowledge and skills, involves an analysis of participant course-related activities after they have completed level 2 evaluations. For example, most MOOCs include resources (e.g., links to various content-relevant websites) and discussion boards that complement the text, videos, and other assets embedded in the course. An analysis of participant engagement in post-evaluation assets may indicate the extent to which individuals are applying their newly acquired knowledge. Moreover, this type of analysis may provide an index of participant persistence, another key indicator of motivation (Bandura, 1977) and the level 1 criterion. In addition, firms can compare pre-course performance (as well as capabilities and competencies) to post-course performance on the behavioral or skill dimensions specific to the course content.

Evaluating level 4 outcomes is perhaps the most challenging part of the process. The ability to link the impact of a specific learning and development activity to criteria such as customer satisfaction, cost savings, or revenue growth is difficult because these performance indices are a function of influences that go well beyond the outcomes of a particular learning activity. That said, some cost-benefit models (e.g., Cascio & Boudreau, 2011) may be used to evaluate financial utility of MOOCs. And given the lower costs associated with design and development using existing MOOCs, the hurdle for demonstrating a positive return will be lower.

In addition, it is possible to link MOOC engagement with customer and related types of performance outcomes. For example, a variety of customer-focused measures can be gathered prior to and immediately following employee involvement in a MOOC (or MOOCs) that addresses customer-focused content. Trends can then be examined to evaluate impact on this particular firm-level outcome. However, similar to evaluating financial impact, the amount of variance explained in both soft (e.g., customer perceptions of service quality) and hard measures (e.g., purchase behaviors) may be small due to the multitude of factors that can influence customer and other firm-level outcomes.

Finally, while traditional evaluation frameworks offer a strong basis for evaluating impact, we contend that examining supply and demand can help make important decisions about the relevance and utility of MOOCs. In particular, this type of evaluation may provide insights regarding the future learning and development needs, and as such, allow employers to design and deliver programs that address the focal needs on a more comprehensive and timely basis.

### ***3.2 MOOC Supply and Demand***

While the criteria discussed in the preceding section provide a foundation for determining MOOC utility and success, other non-traditional metrics may be useful. Thanks to huge enrolments, publicity and an emerging concept, the MOOC market continues to grow, diversify and evolve. Thus, one key consideration is the demand and supply of MOOCs. On the demand side, MOOC participants range widely in demographic characteristics, albeit educated, white and English-speaking males predominate (Emanuel, 2013; Ho et al., 2014; Murphy et al., 2016). This demographic tendency may change as the supply of MOOCs expands, becomes less US-centric and available in other languages. Understanding the roles and relevance of these supply and demand features may be instrumental in designing programs that effectively meet the needs of an increasingly diverse user base.

On the supply side, stakeholders (primarily educational institutions) contribute MOOC content, platforms and marketplaces (Klobas et al., 2014). Similar to learning management systems, such as MOODLE or Blackboard, these platforms house and manage diverse MOOC content and participants. MOOC marketplaces help connect potential learners with available MOOCs. Leading MOOC organisations such as edx.org and coursera.org provide both the marketplace and platform, and then collaborate with individuals and organisations to build and manage MOOC offerings. As such, the number of MOOCs keeps increasing. For example, the European Commission's Open Education Europa reported MOOCs almost doubling—2112–4121—from March 2014 to February 2015 [[openeducationeuropa.eu/en/european\\_scoreboard\\_moocs](http://openeducationeuropa.eu/en/european_scoreboard_moocs)].

Therefore, by tracking MOOC supply and demand, companies can stay abreast of the learning opportunities that may be exploited to complement or extend formal

and informal employer development efforts. This information can then be used by training and development executives to develop a more thoughtful, comprehensive and longer-term learning strategy.

### 3.2.1 MOOC Supply

Given the MOOC ideal of universal access to education, suppliers should range across for—and non-profit entities, academic institutions, governments, non-governmental associations and individuals. Some of the large and well-known suppliers include Open University’s FutureLearn, Canvas Network, NovoEd, Open Learning and early xMOOC spinoffs—Coursera from Stanford, and edX from MIT and Harvard. These organisations tend to have strong university affiliations, provide a MOOC platform and marketplace, and help individuals build and manage MOOCs. In another model, organisations such as Alison.com, Floofl.com, KhanAcademy.org, and Google.com provide both content and a platform for facilitating online education.

The MOOC ideal of universal access is expanding to those without Internet access or prohibited access. Coursera’s Learning Hub program, for instance, partners with dozens of organisations globally, such as public libraries and foundations [[coursera.org/about/programs/learningHubs](http://coursera.org/about/programs/learningHubs)]. These organisations provide physical space and Internet access in locations where affordable bandwidth is limited and education is most needed. For example, Coursera can now ‘export’ MOOCs to South Sudan and Cuba [[blog.coursera.org/post/96565445727/coursera-now-accessible-in-sudan-and-cuba](http://blog.coursera.org/post/96565445727/coursera-now-accessible-in-sudan-and-cuba)].

One such learning hub partner, The United States Department of State, launched its MOOC Camp in August 2013 [[eca.state.gov/programs-initiatives/mooc-camp](http://eca.state.gov/programs-initiatives/mooc-camp)]. In the first year, the initiative hosted 4000 students in over 200 MOOCs across 65 locations. Unlike the typical 5–10 % completion rates, on average 40–60 % of the students completed a MOOC at most locations and over 80 % in some locations such as Kolkata, Kinshasa and Jakarta. Popular subjects were English language learning and teaching (60 %), and entrepreneurship and business (20 %).

Despite the growth in access and the number of MOOCs, the supply of hospitality and tourism MOOCs seems small and narrow. Table 1 lists 21 hospitality MOOCs currently available (Murphy et al., 2016). The topics cover primarily introductory topics across a few discipline- (e.g., marketing) and function-specific (hotel reception and front desk) areas. And while this is a good start, in light of the diverse needs across and within industry segments and geographic locations, the current supply is clearly not adequate for supporting the learning and development needs of the industry.

### 3.2.2 MOOC Demand

Myriad stakeholders have begun to provide a large and varied MOOC supply. In response, growing and diverse enrolment numbers (e.g., Murphy et al., 2016) suggests a large and varied MOOC demand. Enrolment is an obvious MOOC demand measure, correlating positively with endorsement of the MOOC ideal. And even with low completion rates, 7000 students in an early Harvard xMOOC earned a certificate of accomplishment (Murphy et al., 2016). Without MOOCs, these students may have never accessed nor learned the materials.

In addition to course-level enrolments, two types of individual characteristics reflect demand for the MOOC ideal. Participant characteristics such as geographic location, available information and communication technology, education, and gender, illustrate the diverse demand for the MOOC ideal. Secondly, engagement characteristics also illustrate the varied individual demand for MOOCs.

MOOC participant characteristics comprise a vast range of ages, countries, education and abilities (Daniel, 2012; Jordan, 2014). For example, about 30 % of MOOC learners lack post-secondary qualifications (Ho et al., 2014; Murphy et al., 2016). Of the 150,000+ students from 194 countries in MIT's initial MOOC, *Circuits and Electronics*, 29 % reported only an elementary/primary or secondary/high school degree. Although this learner cohort performed lower than those with reported university degrees, in this cohort "were individual students who performed very well (DeBoer, Stump, Seaton, & Breslow, 2013, p. 285)."

Similarly, Tourism Industry Analysis participants varied demographically, albeit minimally (Hara et al., 2013). Their education ranged from high school to PhD, with over 80 % having an undergraduate or graduate degree. The largest academic attainment group was those with a master's degree (33 %), and together with those with doctoral degree (7 %), a little over 40 % of participants had either master's or doctoral degree, which might have reflected the course's focused and technical topic. About 56 % of those completing the survey were male, almost half from 25 to 34 years old and almost half hailed from Western Europe. Analysing these and related statistics can provide important insights regarding demand, and as such, to make decisions about MOOC supply (e.g., greater depth or breadth of content).

Regarding engagement, one approach categorises participants into passive participants, active participants and community contributors (Koller, Ng, Do, & Chen, 2013). Two types of community contribution, forum participation and peer evaluation, similar to Bandura's (1978) reciprocal interaction, associate positively with achievement in numerous xMOOCs (Cisel, 2014). Another engagement approach categorises learners in decreasing order of engagement: No-shows/Shoppers, Dabblers/Observers, Auditors/Casual Learners and Completers (DeBoer et al., 2014; Wilkowski et al., 2014). These distinctions can provide further evidence of impact and a means for developing customised content to meet future learning needs.

## 4 Summary and Future Considerations

As MOOCs become integrated into company-sponsored learning and development activities, consideration must be given the utility and impact of this important learning platform. The evaluation framework proposed above provides a more comprehensive and contextually relevant means for evaluating MOOCs. While traditional approaches to evaluating learning and development activities have direct applicability, careful consideration should be given to the operationalisation and measurement of key evaluation criteria. Moreover, in light of the recent growth in online learning, we contend that measures of MOOC supply and demand provide an additional means for judging the utility and relevance of online learning in general and in MOOCs.

We encourage future research that examines the links among the various effectiveness and utilities indices. As noted above, there is a need to examine how student engagement in various MOOC assets (e.g., discussion forums versus video) may influence self-efficacy, and how self-efficacy may influence online learning and the transfer of knowledge to applied contexts. In addition, it would be extremely helpful to consider the impact of various MOOC design and pedagogical models that address the specific needs of online learning communities. For example, what demographic factors must be considered when addressing the needs of MOOC learners? Which pedagogical models best increase engagement and completion rates, and how? How effective are the interaction variables such as those associated with blended learning (face-to-face interaction) and cMOOCs (connectivism)? Finally, future research should compare and contrast NovoEd and other predominantly cMOOC delivery models with those of the predominantly xMOOC providers.

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## References

- Alliger, G. M., Tannenbaum, S. I., Bennett, W., Jr., Traver, H., & Shotland, A. (1997). A meta-analysis of the relations among training criteria. *Personnel Psychology, 50*(2), 341–358.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215.
- Bandura, A. (1978). The self system in reciprocal determinism. *American Psychologist, 33*(4), 344–358.
- Breslow, L., Pritchard, D., DeBoer, J., Stump, G., Ho, A., & Seaton, D. (2013). Studying learning in the worldwide classroom—Research into edX’s first MOOC. *Research & Practice in Assessment, 8*(Summer), 13–25.
- Cascio, W., & Boudreau, J. (2011). *Investing in people: Financial impact of human resource initiatives* (2nd ed.). Upper Saddle River, NJ: Pearson Education.

- Choi, B., Park, H., Yang, E., Lee, S. K., Lee, Y., & Lee, S. M. (2012). Understanding career decision self-efficacy: A meta-analytic review. *Journal of Career Development, 39*(5), 443–460.
- Cisel, M. (2014). *Analysing completion rates in the first French xMOOC*. Paper presented at the European MOOCs Stakeholders Summit, Lausanne, Switzerland, pp. 26–32.
- Cuffy, V., Tribe, J., & Airey, D. (2012). Lifelong learning for tourism. *Annals of Tourism Research, 39*(3), 1402–1424.
- Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education, 3*, 1–20.
- DeBoer, J., Ho, A. D., Stump, G. S., & Breslow, L. (2014). Changing “course”: Reconceptualising educational variables for massive open online courses. *Educational Researcher, 43*(2), 74–84.
- DeBoer, J., Stump, G., Seaton, D., & Breslow, L. (2013). *Diversity in MOOC students’ backgrounds and behaviors in relationship to performance in 6.002 x*. Paper presented at the Proceedings of the Sixth Learning International Networks Consortium Conference, Boston, MA.
- Downes, S. (2011, May 25). ‘Connectivism’ and connective knowledge, Huffington Post. [http://www.huffingtonpost.com/stephen-downes/connectivism-and-connecti\\_b\\_804653.html](http://www.huffingtonpost.com/stephen-downes/connectivism-and-connecti_b_804653.html)
- Emanuel, E. J. (2013). Online education: MOOCs taken by educated few. *Nature, 503*(7476), 342.
- Grimmelmann, J. (2014). The merchants of MOOCs. *44 Seton Hall Law Review*. [http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2433&context=fac\\_pubs](http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2433&context=fac_pubs)
- Hara, T., Moskal, P., & Saarinén, C. (2013). *Preliminary analyses of a cutting-edge knowledge distribution method of MOOC (Massive, Open, Online Course) to teach tourism as an industry*. Paper presented at the 3rd International Conference on the Measurement and Economic Analysis of Regional Tourism, Medellin, Columbia.
- Ho, A. D., Reich, J., Nesterko, S. O., Seaton, D. T., Mullaney, T., Waldo, J., & Chuang, I. (2014). *HarvardX and MITx: The first year of open online courses*, Fall 2012–Summer 2013. HarvardX and MITx Working Paper No. 1.
- Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *The International Review of Research in Open and Distance Learning, 15*(1), 133–159.
- Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—Self-esteem, generalized self-efficacy, locus of control, and emotional stability—With job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology, 86*(1), 80–92.
- Kirkpatrick, D. L. (1967). Evaluation of training. In R. L. Craig & L. R. Bittel (Eds.), *Training and development handbook* (pp. 87–112). New York: McGraw-Hill.
- Kirkpatrick, D. L. (1994). *Evaluating training programs: The four levels*. San Francisco: Berrett-Koehler.
- Klobas, J. E., Mackintosh, B., & Murphy, J. (2014). The anatomy of MOOCs. In P. Kim (Ed.), *Massive open online courses: The MOOC revolution (Chapter 1)*. New York: Routledge.
- Koller, D., Ng, A., Do, C., & Chen, Z. (2013). Retention and intention in massive open online courses. *Educause Review*, p. 48. <http://www.educause.edu/ero/article/retention-and-intention-massive-open-online-courses-depth-0>
- Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology, 78*(2), 311–328.
- Lewin, T. (2013, January 23). Public universities to offer free online classes for credit. *The New York Times*. Retrieved from <http://www.nytimes.com/2013/01/23/education/public-universities-to-offer-free-online-classes-for-credit.html>
- Murphy, J., Kalbaska, N., Cantoni, L., Horton-Tognazzini, L., Ryan, P., & Williams, A. (2016). Massive open online courses (MOOCs) in hospitality and tourism. In P. Benckendorf & A. Zehrer (Eds.), *Handbook of teaching and learning in tourism*. Cheltenham: Edward Elgar.
- Murphy, J., Kalbaska, N., Horton-Tognazzini, L., & Cantoni, L. (2015). *Online learning and MOOCs: A framework proposal*. Paper presented at ENTER 2015, Lugano, Switzerland.

- Murphy, J., Kalbaska, N., Williams, A., Ryan, P., Cantoni, L., & Horton-Tognazzini, L. (2014). Massive open online courses: Strategies and research areas. *Journal of Hospitality and Tourism Education*, 26(1), 39–43.
- Ng, A. (2013, May 14). Online Learning presentation at Yahoo.com.
- Pappano, L. (2012, November 2). Year of the MOOC. *The New York Times*. <http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html>
- Radford, A. W., Robles, J., Cataylo, S., Horn, L., Thornton, J., & Whitfield, K. E. (2014). The employer potential of MOOCs: A mixed-methods study of human resource professionals' thinking on MOOCs. *The International Review of Research in Open and Distance Learning*, 15(5).
- Reich, J., & Ho, A. D. (2014, January 14). The tricky task of figuring out what makes a MOOC successful. *The Atlantic*.
- Rodríguez-Antón, J. M., Alonso-Almeida, M. M., Andrada, L. R., & Pedroche, M. C. (2013). Are university tourism programmes preparing the professionals the tourist industry needs? A longitudinal study. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 12(1), 25–35.
- Rogers, P. R. (2011). Student online course performance: Does learning style matter? *Journal of the Academy of Business Education*, 12(3), 28–42.
- Rubenstein, L. (2015, January 30). *Enrollment in Wesleyan MOOCs Surpasses 1M*. Retrieved February 21, 2015, from <http://newsletter.blogs.wesleyan.edu/2015/01/30/moocs1million/>
- Sitzmann, T., & Yeo, G. (2013). A meta-analytic investigation of the within-person self-efficacy domain: Is self-efficacy a product of past performance or a driver of future performance? *Personnel Psychology*, 66(3), 531–568.
- Sizoo, S. L., Agrusa, J. F., & Iskat, W. (2005). Measuring and developing the learning strategies of adult career and vocational education students. *Education*, 125(4), 527–538.
- Tessler, B. L., Bangser, M., Pennington, A., Schaberg, K., & Dalporto, H. (2014). *Meeting the needs of workers and employers: Implementation of a sector-focused career advancement model for low-skilled adults*. New York: MDRC.
- Tracey, J. B., Tannenbaum, S. I., & Kavanagh, M. J. (1995). Applying trained skills to the job: The importance of the work environment. *Journal of Applied Psychology*, 80(2), 239–252.
- Walsh, L. (2015). Bringing MOOCs back to life. *Chief Learning Officer*, 14(2), 26–47.
- Weinstein, M. (2014). Managing MOOCs. *Training*, 51(5), 26–28.
- Wilkowski, J., Deutsch, A., & Russell, D. M. (2014, March). Student skill and goal achievement in the mapping with Google MOOC. In *Proceedings of the first ACM conference on Learning@scale conference* (pp. 3–10). ACM.

**Part VIII**  
**Digital Economy**



# The Impact of Sharing Economy on the Diversification of Tourism Products: Implications for Tourist Experience

Dan Wang, Mimi Li, Pengcheng Guo, and Wenqing Xu

**Abstract** In sharing economy, product variety and quality options expand quite dramatically, because the new platforms that support P2P business allow society to offer individuals relatively low-risk micro-entrepreneurship and tap into idle abilities and aspirations. This study investigates the impact of sharing economy on the diversification of tourism products. The findings confirm the proposed proposition in that the products available on the P2P websites are more diversified than the ones available on OTAs websites. This study highlights the potential changes of tourist experience due to the use of these P2P websites for travel planning.

**Keywords** Sharing economy • Tourist products • Tourist experience • Hong Kong • Peer-to-peer

## 1 Introduction

The development of information technology has promoted society transforming innovations such as digital marketplaces, powerful mobile computers, and a digital reputation system (Castells, 2002, 2011; Webster, 2014). In recent years, these IT-enabled innovations collaborated to create a series of digitally intermediated peer-to-peer (P2P) business, which is labelled as sharing economy or peer economy, or alternatively collaborative consumption (Zervas, Proserpio, & Byers, 2014). This new economy enables the disaggregation of physical assets in space and in time and the exchange of these disaggregated components (e.g., a few days in an apartment, a seat in a drive from A to B city) on digital platforms (Sundararajan,

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2013). For instance, the digital marketplaces have been created for the sharing of assets such as accommodation places (e.g., Airbnb.com; Flipkey.com) and cars (e.g., RelayRides.com; Lyft.com), professional service provision (e.g., Uber.com; Kitchi.com; Bemyguest.com); general-purpose freelance labor provision (e.g., oDesk.com; TaskRabbit.com), and peer-to-peer asset sales (e.g., Etsy.com) (Sundararajan, 2014). The products offered in these digital peer-to-peer businesses meet the needs of travelers who require the support of physical assets and professional service temporarily. Thus, tourists start to ride on the wave of sharing economy to stay in other people's houses/apartments, ride on other people's cars, and enjoy the tour guide service from untrained but passionate locals (Trivett & Staff, 2013).

The embrace of sharing economy by tourists leads to a series of research questions because the new products, suppliers, and innovative way of consumption are challenging the assumptions of tourism experience, tourism supply chain, tourism products, and industrial economics. However, the studies regarding sharing economy and tourism are limited, and there are only a few papers focusing on the issues introduced by the peer-to-peer (P2P) accommodation rentals, for example, the overview of P2P accommodation (Guttentag, 2013), the impact of P2P accommodation rentals on hotel industry from economic scale perspective (Zervas et al., 2014), the guests' experience with the P2P accommodation rentals (Chen, 2012; Shengkui, Shulin, & Liao, 2013; Tussyadiah & Zach, 2015; Zervas, Proserpio, & Byers, 2015), and the moral influence of P2P accommodation as a kind of alternative tourism (Molz, 2012, 2013; Steylaerts & Dubhghaill, 2012). With the upsurge of sharing economy in different lines of businesses to serve tourists over their trips, it is imperative to investigate the impact of this new way of consumption from a broader perspective.

In sharing economy, product variety and quality options expand quite dramatically, because the new platforms that support P2P business allow society to offer individuals relatively low-risk micro-entrepreneurship and tap into idle abilities and aspirations (Sundararajan, 2013). Thus, the nature of sharing economy indicates that the new platforms such as Airbnb, "a trusted community marketplace for people to list, discover, and book unique accommodations around the world" (About us - Airbnb, n.d.), and BeMyGuest, "a Singapore-based online marketplace for tours and travel activities" (Huang, 2014), should provide a wider range of travel products than traditional online travel agencies (OTAs) such as Expedia.com or Ctrip.com. If this proposition holds, the tourist experience in destinations can be substantially influenced if tourists employed these platforms to plan their trips. Therefore, it is important to explore the impact of sharing economy on the diversification of tourism products, as the goal of this study. The investigation of this research question provides a foundation to examine the affordance of these new platforms under sharing economy (Molz, 2013) and the diversification of tourist experience and tourist gaze (Shakeela & Weaver, 2014) enabled by these platforms.

## 2 Research Background: Tourist Gaze, Tourism Products, and Sharing Economy

In recent years, the phenomenon of peer-to-peer (P2P) services has become more popular in tourism and hospitality marketplaces (Guttentag, 2013; Teubner, 2014). The digital marketplaces, powerful mobile computers, and digital reputation system (Castells, 2002, 2011; Webster, 2014) facilitate this series of digitally mediated P2P business, a socioeconomic system labeled as sharing economy, peer economy, or collaborative consumption (Botsman & Rogers, 2011; Belk, 2014). Collaborative consumption takes place in an organized network system with service providers act as a matchmaker, connecting individuals with underused assets as user-providers (i.e., suppliers) and others who are willing to pay for them, as user-receivers (i.e., consumers) (Belk, 2014). The business models under the umbrella of sharing economy lend the opportunities for the development of creative tourism from supply side, because the peer-to-peer business allow the offering of relatively low-risk micro-entrepreneurship and the activation of idle abilities and aspirations (Sundararajan, 2013). Motivated by the potential benefits and entrepreneurial dreams, increasing number of “ordinary people” will tap into “anything in a destination, tangible or intangible” to produce tourism products. Thus, this study explores the impact of sharing economy on the diversification of tourism products.

There is a common understanding that a tourism product is a complete experience that fulfils multiple tourism needs, and provides corresponding benefits (Xu, 2010). Tourism is a complicate process involving a wide variety of tangible and intangible elements (Mill & Morrison, 2002), and tourists gain touristic experience by completing the process through the consumption of various goods (Volo, 2009). Due to its broad scope, in the relevant literature, there is lack of a consensus definition of a tourism product. Smith (1994) developed a conceptual framework to illustrate the elements that are essential for a tourism generic product and described the generic production process. The previous literature focused on identifying the nature of tourism products. However, from a viewpoint of tourism industry, it is important to identify the substance that can be made of tourism products.

The investigation of the substance that can be made of tourism products requires the understanding of the nature of tourist experience. Tourism has been recognized as the activity that celebrates the bodily desires (Wang, 1996), and the body is the major locus of senses (Synnott, 2002), thus, tourist experience consists of tourist’s sensuous experience (Quan & Wang, 2004). According to Urry and Larsen (2011), visual is the organizing sense in tourism, albeit the criticism that view sight as the most superficial of the senses (Buzard, 1993). Sight, as the noblest of the senses, is “the most discriminating and reliable of the sensuous mediators between humans and their physical environment” (p. 16). The sight directs the more multi-sensuous ways that are involved in tourist experience, such as touching, tasting, smelling, hearing and so on. Therefore, the fundamental nature of many tourist experiences is visual. The theory of tourist gaze indicates that a large part of tourist experience “is

to gaze upon or view a set of different scenes, of landscapes or townscapes which are out of the ordinary” (Urry & Larsen, 2011). Tourists look at what they encounter during trips. In recent years, with the challenge of “performance turn” in tourism studies that emphasize other sensuous ways that are involved in tourist experience (Quan & Wang, 2004), the concept of tourist gaze was developed as performative and embodied practices that highlight each gaze depends upon practices and material relations as well (Urry & Larsen, 2011). Tourist gaze is argued to be presented within tourism performances such as tourist activities like hiking, dining, because distinct visual environment housed these tourist activities. Furthermore, this gaze is shaped by interest and curiosity. The concept of tourist gaze theorized our understanding of how tourist experience were produced by both visual spectacle and mental discernment that is socially and culturally organized (Chhabra, 2009).

Taking tourist gaze as the center of tourist experience, this study understands tourist products as the commodity that can attract tourist gaze. Thus, the investigation of the substance that can be made of tourism products is the investigation of the potential objects of the tourist gaze. In the sociology of tourism, scholars recognized that all tourists embody a quest for authenticity (MacCannell, 1976; Moscardo & Pearce, 1986; Turner & Manning, 1988; Wang, 2000). MacCannell (1976) drew an analogy between tourists and contemporary pilgrim, showing particular fascination in the real lives of others that somehow possess a reality that is hard to discover in their own experiences. MacCannell (1999) notes that “anything is potentially an attraction. It simply awaits one person to take the trouble to point it out to another as something noteworthy, or worth seeing” (p. 192). Therefore, anything in a destination, tangible or intangible, can be tourism products if it is appropriately commoditised.

### 3 Methods

In order to examine the impact of sharing economy on the diversification of tourism products, this study compares the tourism products for the destination of Hong Kong available on the traditional online travel agencies (OTAs) and peer-to-peer (P2P) business online channels (here after called P2P websites). The research design considered the differences of suppliers that offer products on different platforms. OTAs are usually the distribution channels for attraction operators, travel agencies, and commercial hotels, while P2P channels are for individuals and small-size businesses. Ctrip ([www.ctrip.com](http://www.ctrip.com)) and Expedia ([www.expedia.com](http://www.expedia.com)) were selected as the representatives of OTAs for their leading position in Asia and globally. Airbnb ([www.airbnb.com](http://www.airbnb.com)), BeMyGuest ([www.bemyguest.com.sg](http://www.bemyguest.com.sg)), and GetYourGuide ([www.getyourguide.com](http://www.getyourguide.com)) were selected as the representatives of P2P business online channels for their dominant positions in the market to provide P2P based accommodations and travel services (Winkler & Macmillan, 2015; Prabu, 2013).

Specifically, the comparison focuses on the three aspects, including the variety of travel activities, the geographic scope of attractions and places that can be reached, and the geographic span of accommodation offering to travellers. The raw data are the items available for sale on the above websites, including accommodation, tours, attraction tickets, activities (e.g., Dinner in a temple), and facilitate services (e.g., calling cards, ferry tickets). For the purpose of comparison, we broke down each tour product into two parts: activities and places and listed. Therefore, the unit of analysis includes accommodation, attractions and places, activities, and facilitate services. Data were collected from May to July in 2015. We manually filed the items from *expedia.com*, *ctrip.com*, *bemyguest.com* and *getyourguide.com*. The list of accommodations offered on *Ctrip.com* was manually recorded and the geographic location (longitude and latitude) information of accommodations was retrieved from Google map, while the list of those offered by *Airbnb.com* including their geographic location information were obtained by a crawler script written in Python. We acknowledge that *expedia.com* also offer accommodation products, but its inventory is largely overlapped with *Ctrip*. Thus, we only collected the data of accommodation products from *ctrip.com* because it provides more choices than *expedia.com*.

The data was analyzed in several steps. For attractions and places, activities, and facilitate services, the common and different items on *expedia.com*, *ctrip.com*, *bemyguest.com*, and *getyourguide.com* were identified and compared. Furthermore, the attractions and places that are included in the tourism products were mapped out for identifying the differences among different websites. For the available products of accommodation, the software Tableau was used to visualize all items in different districts of Hong Kong based on the geographic location information.

## 4 Results

Table 1 lists the number of products available in the examined websites. In the subsections, the commonalities and differences between traditional OTAs (i.e., Expedia and Ctrip) and P2P websites (i.e., BeMyGuest, GetYourGuide, and Airbnb) are illustrated and presented in figures.

**Table 1** The number of tourism products available in different websites

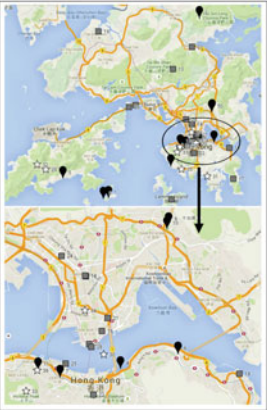
	BeMyGuest	GetYourGuide	Expedia	Ctrip	Airbnb
Places and attractions	41	27	29	38	N/A
Activities	29	14	15	18	N/A
Facilitate services	5	2	4	12	N/A
Accommodations	N/A	N/A	N/A	1504	2954

### 4.1 Tour Products: Comparison of Places and Attractions Available on OTAs and P2P Websites

A total number of 64 unique places and attractions were identified from all websites. Exhibition 1 presents the commonalities and differences between OTAs and P2P websites, and mapped out the places and attractions.

The eight places and attractions that are covered in the tourism products in all websites are the most famous landmark attractions, such as Victoria Harbour (#30), the Peak (#33) and Temple Street Night Market (#34) which are listed in Hong Kong’s Top 10 attractions according to a statistical review of Hong Kong Tourism Board (Top 10 attractions, n.d.). The 17 places and attractions that are only covered in Expedia and Ctrip are mainly for sightseeing tours, and mainly are commercial attractions such as museums, theme parks and public leisure facilities such as parks and outlying islands. In P2P websites, 11 attractions and places were found to be unique, which are located at residential area instead of the bustling districts. For example, Wah Fu Estates (#3) as a wealthy public housing is the reflection of rich people’s life style, which offers travelers a different taste of Hong Kong. What’s more, the website enables visitors to explore the typical facilities of Hong Kong, such as the Harbour’s Shelter (#4), which serves as a shelter for fishing boats during typhoon. Geographically, P2P websites offers products that are staged in the places beyond the so called tourist areas where most of landmark scenery areas and attractions located in.

Places and attractions in P2P websites	Common places and attractions in all websites	Places and attractions in OTA websites
<b>BeMyGuest</b>	29 Lantau Island	<b>Expedia</b>
1 Cheng Chau Island	30 Victoria Harbour	12 Fa Yuen Market
2 Pat Sin Leng Country Park	31 Repulse Bay	13 Tai Mo Shan
3 Wah Fu Estates	32 Ngong Ping Village	14 Goldfish market
4 The Harbour’s Shelter	33 Victoria Peak	
<b>GetYourGuide</b>	34 Temple Street Night Market	<b>Ctrip</b>
5 Cheung Sha Beach	35 Aberdeen	15 Tsing Ma Bridge Observation Deck
6 Chung King Mansion	36 Man Mao Temple	16 3D Museum
7 Statue square		17 Shek O
		18 Hong Kong Museum of Coastal Defence
		19 Hong Kong Wetland Park
		20 Space Museum
		21 The Hong Kong Polytechnic University
		22 Wanchai heritage trail
		23 Tai Po Market
		24 Sham Shui Po
		25 Hong Kong Maritime Museum
<b>BeMyGuest &amp; GetYourGuide</b>		<b>Expedia &amp; Ctrip</b>
8 Cheung Po Tsai Cave		26 Noah’s Ark
9 Chi Lin Nunnery		27 Lamma Island
10 Nan Lian Garden		28 The Avenue of Stars
11 Hollywood Road		



(P2P websites): 1 2 3 4 5 6 7 8 9 10 11  
 (OTAs) 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28  
 (Common items in all channels) 29 30 31 32 33 34 35 36

**Exhibition 1** List and map of places and attractions in different websites

### 4.2 Tour Products: Comparison of Activities Available on OTAs and P2P Websites

There are 41 activities identified as tourism products for sale on the websites. Table 2 presents the commonalities and differences between OTAs and P2P websites.

Six travel activities are offered in all websites such as shopping, dining, and sightseeing in famous scenic area. The OTAs offer seven travel activities, with theme of dining, show watching, and spa. Comparatively, the P2P websites offer a

**Table 2** Travel activities for sale in different websites

Activities in P2P websites	Common activities in all websites	Activities in OTAs websites
<p><b>Be My Guest</b></p> <p>14 A ‘buk buk chai’ boat ride to another island</p> <p>15 Explore local delicacies and dishes</p> <p>16 Making salted egg yolk and white bean congee in Tai O</p> <p>17 Thrilling Kowloon &amp; Hong Kong Island Aerial Private Tour Experience</p> <p>18 Gambling in Macau</p> <p>19 Complimentary shot at every bar and crazy deals for beers and cocktails</p> <p>20 Take a Peek in the Ghost Villages of the Northern New Territories</p> <p>21 Haunted tour in Wanchai</p> <p>22 Learning cultural revolution</p> <p>23 Witness and Architectural Phenomenon through the Western Shoreline Cruise</p> <p>24 Visit traditional Buddhist temples, Christian churches and Muslim mosques and experience the buzzing city life of Hong Kong</p> <p>25 2016 New Year’s Eve Countdown</p> <p>26 Car racing</p>	<p>1 Dinner in outlying islands</p> <p>2 A ride on Ngong Ping 360 cable car</p> <p>3 Peak tram ride</p> <p>4 Attend a workshop of a jewellery manufacturer</p> <p>5 Cruise along the harbour</p> <p>6 Enjoy the Symphony of Lights</p>	<p><b>Expedia</b></p> <p>7 Spa</p> <p>8 Enjoy horse racing show</p>
<p><b>Get Your Guide</b></p> <p>27 Dinner in Tai O Heritage Hotel</p> <p>28 Watch tea making</p> <p>29 Explore Feng Shui</p> <p>30 Enjoy Hong Kong’s art galleries</p>		<p><b>Ctrip</b></p> <p>9 Seafood in Sai Kung</p> <p>10 Enjoy Beijing Roast Duck for dinner</p> <p>11 Enjoy concert show</p>
<p><b>Be My Guest &amp; Get Your Guide</b></p> <p>31 Hiking</p>		<p><b>Expedia &amp; Ctrip</b></p> <p>12 Seafood in Lamma Island</p> <p>13 Enjoy Hong Kong style afternoon tea</p>

wide range of travel activities. In the total of 41 activities provided by the selected OTAs, 29 of them are offered on BeMyGuest.com. BeMyGuest is offering very special activities to travelers who want to experience more with the aid of the individual hosts. It seems that the website is helping people to discover the real Hong Kong and experience the unusual things. For example, haunted tours have been organized in different districts for tourists seeking for novelty. Car racing and aerial sightseeing tour are for people who seek for adventures. Furthermore, architecture professionals offer tour for the appreciation of architectures in Hong Kong. The P2P websites also offer opportunities for experiential learning. For instance, tourists can get chances for distinctive cooking process, such as making salted egg yolk and white bean congee. GetYourGuide offers more products focusing on the exploration of Chinese culture. Tai O Heritage Hotel is a revitalized historical building, which has a glass-roofed restaurant named Tai O lookout surrounded by lively greenery, with panoramic view of the South China Sea. The website also offers people the tea making and Feng Shui workshops. Travelers can find the amazing and unique art galleries of Hong Kong from GetYourGuide as well. What's more, the only activity that both BeMyGuest and GetYourGuide have designed for tourists is hiking. It has to be noted that over 42 % of the activities identified from GetYourGuide are common ones that can also be found in the other websites.

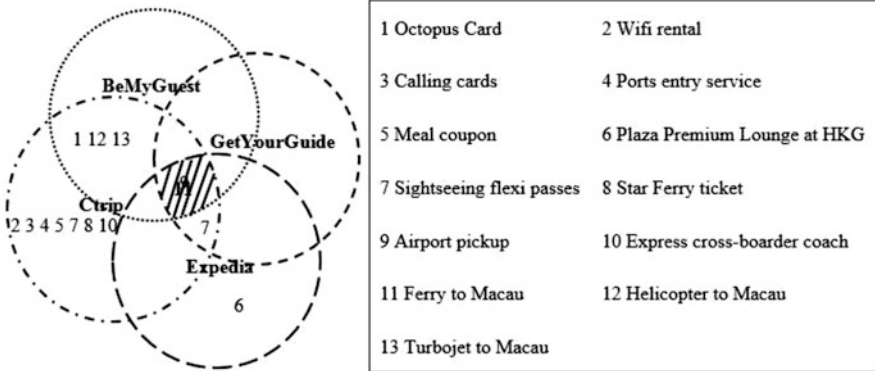
### ***4.3 Tour Products: Comparison of Facilitate Services Available on OTAs and P2P Websites***

Exhibition 2 presents the comparison of the facilitate services available on all websites. Total 13 items were identified from the websites. The range of facilitate services is broad, from transportation arrangements to telecommunication services. 12 out of 13 were identified from the OTAs. Only six items were identified from the P2P websites.

### ***4.4 Accommodation Products: Comparison of Accommodations on OTAs and P2P Websites***

Total 291 accommodation products are available on the Ctrip, while 1008 products were found on the Airbnb. We mapped all the products from two websites on Exhibition 3. Hong Kong was divided in six areas. It is worth noting that the accommodation products offered by individuals on the Airbnb widely spread through the residential areas, particularly in East, Central and West districts, and TsimShaTsui areas (as highlighted by light shadow on the Exhibitions 3). There are no hotel accommodations in these residential areas. The accommodation products





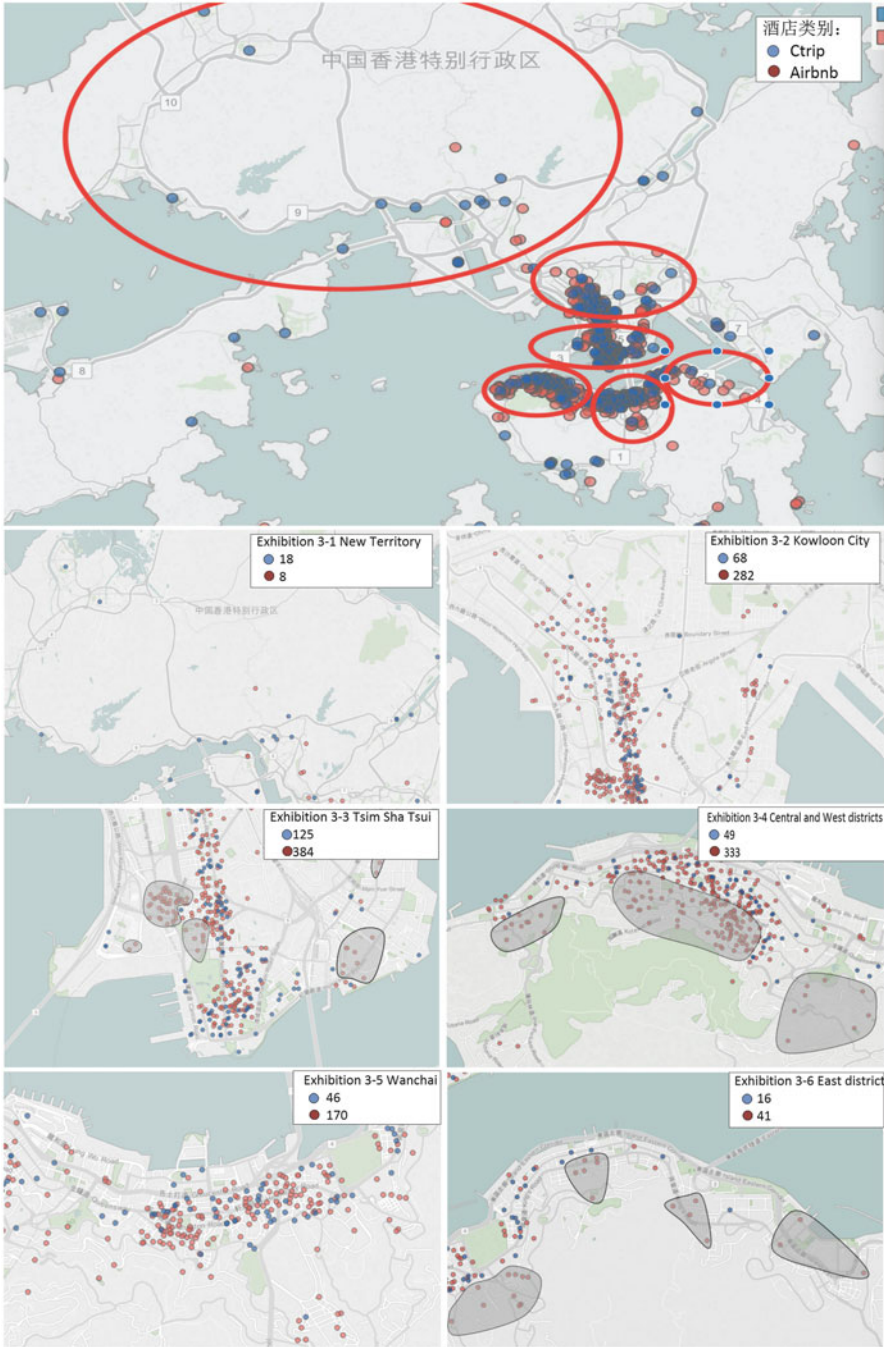
**Exhibition 2** Facilitate services in different channels

available on the Airbnb cover a wider geographical scope of Hong Kong than the accommodation products from the Ctrips, most of which are commercial hotels and guest houses.

## 5 Conclusions and Implications

This study empirically confirms the proposition that the development of sharing economy increases the diversity of tourism products available for choice in the market. The comparison of the products available on the traditional OTAs websites and P2P websites shows that tourist experience can be curated differently if tourists use different websites to plan their trips. The OTAs websites direct tourists to famous attractions and sightseeing areas while the P2P websites direct tourists to more exotic attractions or “non-tourism” areas. The OTAs websites offer chances for a limited choice of organized destination activities while the P2P websites make a wide range of destination activities available and most of them offer a great degree of involvement. The OTAs websites send tourists to commercial hotels while the P2P websites invite tourists to stay at local people’s apartments in local communities. This study indicates that the development of sharing economy potentially enriches tourist gaze because more grassroots suppliers provide more long-tail tourism products to satisfy the needs of niche markets.

This study provides several important implications. First, this study tapped upon the nature of sharing economy, encouraging low-risk micro-entrepreneurship and idle abilities and aspirations (Sundararajan, 2013), and identified the impact of sharing economy on tourism industry along this dimension. Second, by anchoring this study in the theories of tourist gaze, this study adopted a new perspective to investigate the impact of P2P business. This perspective highlights the potential changes of tourist experience due to the use of these P2P websites for travel planning. The affordance of these websites (Molz, 2013), which is tourist



**Exhibition 3** Mapping the accommodation products on Ctrip and Airbnb

experience afforded by exotic attractions, experiential destination activities, and non-traditional accommodation, is different from the affordance of the OTAs, which is tourist experience afforded by pre-defined tourist attractions, scenic areas, and staged destination activities. Thus, future studies can further explore the changes of tourist experience introduced by P2P businesses, the differences of tourist experience due to the use of different websites for travel planning, and the measurement of the changes. Last but not the least, this study shows that the diversification of tourism products helps to commoditize more ordinary life (MacCannell, 1999) in a destination and present to tourists. Leveraging by social media platforms and web 2.0, the explosion of a destination under a spotlight to a more extended level can influence destination image. Therefore, destination marketing organizations and local government should pay attention to both offline and online reputation and image of the destination that may be gradually changing due the development of sharing economy.

## References

- About us - Airbnb. (n.d.). Retrieved from <https://www.airbnb.com/about/about-us>
- Belk, R. (2014). You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research*, 67(8), 1595–1600.
- Botsman, R., & Rogers, R. (2011). *What's mine is yours: How collaborative consumption is changing the way we live*. London: Collins.
- Buzard, J. (1993). *The beaten track: European tourism, literature, and the ways to culture, 1800–1918*. New York: Oxford University Press on Demand.
- Castells, M. (2002). *The Internet galaxy: Reflections on the Internet, business, and society*. Oxford: Oxford University Press.
- Castells, M. (2011). *The power of identity: The information age: Economy, society, and culture* (Vol. 2). Chichester: Wiley.
- Chen, D. J. (2012). Global concept, local practice: Taiwanese experience of CouchSurfing. *Hospitality & Society*, 1(3), 279–297.
- Chhabra, D. (2009). How they see us: Perceived effects of tourist gaze on the Old Order Amish. *Journal of Travel Research*, 1–14. doi:10.1177/0047287509336475.
- Guttentag, D. (2013). Airbnb: Disruptive innovation and the rise of an informal tourism accommodation sector. *Current Issues in Tourism*, 1–26. doi:10.1080/13683500.2013.827159.
- Huang, E. (2014, June 10). BeMyGuest secures US\$800 K led by TNF Ventures to scale regionally. e27. Retrieved from <http://e27.co/bemyguest-secures-us800k-led-by-tnf-ventures-to-scale-regionally-20140610/>
- MacCannell, D. (1976). *The tourist: A new theory of the leisure class*. Berkeley: University of California Press.
- MacCannell, D. (1999). “New Urbanism” and its discontents. In J. Copjec & M. Sorkin (Eds.), *Giving ground: The politics of propinquity* (pp. 106–128). New York: VersoMill, R. C.
- Mill, R. C., & Morrison, A. M. (2002). *The tourism system*. Dubuque: Kendall Hunt.
- Molz, J. G. (2012). CouchSurfing and network hospitality: ‘It’s not just about the furniture’. *Hospitality and Society*, 1(3), 215–225.
- Molz, J. G. (2013). Social networking technologies and the moral economy of alternative tourism: The case of couchsurfing.org. *Annals of Tourism Research*, 43, 210–230.
- Moscardo, G. M., & Pearce, P. L. (1986). Historic theme parks: An Australian experience in authenticity. *Annals of Tourism Research*, 13(3), 467–479.

- Prabu, K. (2013, December 18). BeMyGuest attracts strategic investment from online agency Tidesquare. *Tnooz*. Retrieved from <http://www.tnooz.com/article/bemyguest-tidesquare-investment>
- Quan, S., & Wang, N. (2004). Towards a structural model of the tourist experience: An illustration from food experiences in tourism. *Tourism Management*, 25(3), 297–305.
- Shakeela, A., & Weaver, D. (2014). The exploratory social-mediatised gaze reactions of virtual tourists to an inflammatory Youtube incident. *Journal of Travel Research*, 1–12. doi:10.1177/0047287514532369.
- Shengkui, D., Shulin, Z., & Liao, J. (2013). The new and fashionable tourist group who obtain the confidence and warmth: An elementary research on couchsurfer. *Tourism Tribune*, 28(7), 101–108.
- Smith, S. L. (1994). The tourism product. *Annals of Tourism Research*, 21(3), 582–595.
- Steylaerts, V., & Dubghail, S. O. (2012). Couchsurfing and authenticity: Notes towards an understanding of an emerging phenomenon. *Hospitality and Society*, 1(3), 261–278.
- Sundararajan, A. (2013). From Zipcar to the sharing economy. *Harvard Business Review*. Retrieved from <https://hbr.org/2013/01/from-zipcar-to-the-sharing-eco/>
- Sundararajan, A. (2014). Peer-to-peer businesses and the sharing (collaborative) economy: Overview, economic effects and regulatory issues. *Written testimony for the hearing titled The Power of Connection: Peer to Peer Businesses, January*.
- Synnott, A. (2002). *The body social*. London: Routledge.
- Teubner, T. (2014). *Thoughts on the sharing economy*. Paper presented at the proceedings of the international conference on e-commerce.
- Top 10 Attractions: Hong Kong Tourism Board. (n.d.). Retrieved from <http://www.discoverhongkong.com/uk/see-do/highlight-attractions/top-10/index.jsp>
- Trivett, V., & Staff, S. (2013). What the sharing economy means to the future of travel. *Skift Report*, 7. Retrieved from <http://products.skift.com/trend/>
- Turner, C., & Manning, P. (1988). Placing authenticity—On being a tourist: A reply to Pearce and Moscardo. *Journal of Sociology*, 24(1), 136–139.
- Tussyadiah, I. P., & Zach, F. (2015, May). *Hotels vs. peer-to-peer accommodation rentals: Text analytics of consumer reviews in Portland, Oregon*. Paper presented at the travel and tourism research association (TTRA) 46th annual, Portland, OR.
- Urry, J., & Larsen, J. (2011). *The tourist gaze 3.0*. London: Sage.
- Volo, S. (2009). Conceptualizing experience: A tourist based approach. *Journal of Hospitality Marketing & Management*, 18(2–3), 111–126.
- Wang, N. (1996). Logos-modernity, Eros-modernity, and leisure. *Leisure Studies*, 15(2), 121–135.
- Wang, N. (2000). *Tourism and modernity: A sociological analysis*. Oxford: Pergamon.
- Webster, F. (2014). *Theories of the information society*. New York: Routledge.
- Winkler, R., & Macmillan, D. (2015, June 17). The secret math of Airbnb's \$24 billion valuation: Home-rental site's revenue projected to top more than \$900 million. *The Wall Street Journal*. Retrieved from <http://www.wsj.com/articles/the-secret-math-of-airbnbs-24-billion-valuation-1434568517>
- Xu, J. B. (2010). Perceptions of tourism products. *Tourism Management*, 31(5), 607–610.
- Zervas, G., Proserpio, D., & Byers, J. (2014). The rise of the sharing economy: Estimating the impact of Airbnb on the hotel industry. *Boston U. School of Management Research Paper*, (2013–16). Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2366898](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2366898)
- Zervas, G., Proserpio, D., & Byers, J. (2015). *A first look at online reputation on Airbnb, where every stay is above average*. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2554500](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2554500)

# Strategic Self-presentation in the Sharing Economy: Implications for Host Branding

Iis P. Tussyadiah

**Abstract** Peer-to-peer accommodation platform is a unique venue of commercial social exchanges where mixed-mode interactions (i.e., online first, then offline) occur between hosts and guests. With the continuous growth of sharing economy comes the importance to better understand the strategies that hosts use to communicate with and attract their prospective consumers. Using the framework of personal branding and self-presentation, this study explored the different ways hosts of peer-to-peer accommodation articulate their profile online. Using host descriptions from 12,785 Airbnb listings in New York, United States, five clusters of host self-presentation were identified: The Global Citizen, The Local Expert, The Personable, The Established, and The Creative. Honest and positive self-presentation, as well as competence strategies were identified from these clusters. The host profiles were further explored to identify differences in their behaviour, listing characteristics, and guest review ratings.

**Keywords** Sharing economy • Personal branding • Host branding • Self-presentation • Airbnb

## 1 Introduction

Since its introduction in the late 2000s, the socioeconomic system labelled as sharing economy, peer-to-peer economy, on-demand economy, or collaborative consumption (Botsman & Rogers, 2011; Belk, 2014) has been experiencing a tremendous growth with a large number of users embracing it for different product and service categories. Taking advantage of online social network technology, companies such as Airbnb facilitate new ways of resource redistribution among consumers to fulfil unmet demand with idling supplies. In the travel and tourism industry, peer-to-peer accommodation is considered a significant new entrant in the competitive landscape of accommodation sector. Therefore, it is important to better understand the dynamics that lead to the future growth of peer-to-peer

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accommodation and cement its position as a competitive player in the travel and tourism marketplace.

Salient to understanding the sharing economy is exploring both sides of users who are participating in these platforms: user-providers (i.e., hosts) and user-receivers (i.e., guests). Due to the recent emergence of sharing economy as a research topic in travel and tourism, studies on the characteristics and behaviour of its users are extremely scarce. A few studies on consumer characteristics and motivations to participate in the sharing economy (and benefits sought from doing so) did not differentiate between the user categories (e.g., Hamari, Sjöklint, & Ukkonen, 2013; Kim, Yoon, & Zo, 2015; Möhlmann, 2015). Hence, there is lack of specification in terms of strategic behaviour that consumers adopt in their participation. Other studies focused on the market characteristics and benefits sought by guests (e.g., Tussyadiah, 2015; Tussyadiah & Pesonen, 2015), but excluded host behaviour. Belotti, Ambard, Turner, Gossmann, Demkova, and Carroll (2015) explored different motivations among user-receivers, user-providers and service providers, but did not specify the consumption contexts (i.e., using sharing economy as one broad consumption category). While these studies are beneficial in explaining the different factors that drive the adoption of commercial sharing platforms by consumers, they are limited in the conceptualization of user-provider behaviour and, therefore, the managerial implications for user-providers in terms of strategies for future growth beyond the initial stage of adoption.

In light of the limitation in current literature, this study aims at addressing two broad research questions: (1) “How do the hosts of peer-to-peer accommodation articulate their identity online?” and (2) “Are specific online self-presentation techniques associated with better guest evaluation?” As user-providers in commercial sharing systems, hosts have a unique position to represent their own identity and at the same time be associated with a service provider in the eyes of their potential guests (i.e., prospective customers). In other words, while they are considered as “peers” of user-receivers in the social network, they also carry a “brand” associated with the services they provide. Therefore, the ways hosts express themselves by crafting and posting their profile online need to be explored from two strategic perspectives: personal branding (i.e., self-marketing) and its relationship with service providers’ brand. In order to answer the research questions, this study consults the theoretical foundation behind personal branding as well as self-presentation strategies in the contexts of online marketing and social networks (e.g., Chen, 2013; Labrecque, Markos, & Milne, 2011; Shepherd, 2005). In particular, this study conducts a series of text analyses on descriptions of Airbnb hosts to identify the underlying self-presentation techniques. Further, based on the characteristics that differentiate these techniques, this study provides recommendation for future research direction in host branding.



## 2 Online Personal Branding

The changing landscape of social practices and personal (consumer-to-consumer) relationship formation via technology-mediated communication forms unique online behaviour among Internet users. The proliferation of social media has encouraged Internet users to create and manage an online identity that signifies their personal brand. Previous research has explored the topic of self-marketing by examining the strategies people use to present themselves in personal web pages and various social media platforms (e.g., social networking sites, online forums, blogs, etc.) for various goals (e.g., Chen, 2013; Dominick, 1999; Kim & Tussyadiah, 2013; Labrecque et al., 2011; Shepherd, 2005). The premise of these studies is that consumers are applying the same marketing and branding principles originally developed for products and services to generate a favourable image of themselves (Chen, 2013; Schwabel, 2009). Specifically, Schwabel (2009) defines personal branding as the process by which individuals differentiate themselves from the crowd by articulating their unique value proposition and leveraging it with a consistent image across different platforms to achieve their goals. While a number of research on personal branding and self-marketing focuses on leaders or celebrities (e.g., in political campaigns, in advertising within the entertainment industry), an increasing number of studies also deal with self-presentation among “amateur individuals” or “everyday people” (Chen, 2013; Labrecque et al., 2011; Shepherd, 2005). The goals of personal branding have been tied to seeking employment, establishing friendship, seeking social support, dating, or simply self-expression (Labrecque et al., 2011). In this study, while still retaining their amateur quality, peer-to-peer accommodation hosts are expected to employ specific personal branding tactics in order to induce booking from prospective guests.

Personal branding is associated with the process of “packaging and editing the self,” which involves making choices of what information regarding self to include and what to leave out (Toma, Hancock, & Ellison, 2008). An increase in consumer empowerment and control of social media landscape leads to the phenomenon of consumer “egocentrism” (Chen, 2013). That is, with an absence of face-to-face confirmation, a person is only what is expressed in his/her online content, making him/her in control of his/her own brand (Sanderson, 2008; Trammel & Keshelashvili, 2005). Literature on self-presentation and impression management in technology-mediated communication, drawing largely from Goffman’s (1990) theory of self, has focused on social relationships that are exclusively online (e.g., personal websites, blogs, YouTube, etc.). Within this literature, the emphasis is on the absence of nonverbal communication cues and the potentially asynchronous communication, which lead to the so-called selective self-presentation strategies (Walther, 1992, 2007; Walther & Burgoon, 1992), where online personal identity is malleable and subject to self-censorship. However, in areas of mixed-mode social relationships (i.e., when people first meet online and then move offline), self-presentation and personal branding strategies are entangled with anticipated future interactions (Gibbs, Ellison, & Heino, 2006).

In a typical peer-to-peer accommodation system, prospective hosts and guests communicate online and, after confirming reservation, interact offline during service delivery (consumption). This modality switch (i.e., from online to offline) has been suggested to shape the degree of self-disclosure in online self-presentation strategies (e.g., Ellison, Heino, & Gibbs, 2006; Gibbs et al. 2006). That is, while highlighting attributes of personal strength and uniqueness is an important aspect of personal branding, communicating an online identity that is consistent with expected offline impression from target audience will result in perception of authenticity (Labrecque et al., 2011). Indeed, in the contexts of social media communication, Kim and Lee (2011) suggest two strategies with regards to self-presentational behaviour: honest and positive [i.e., selective (Walther, 1992, 2007)] self-presentation. Honest self-presentation tactics emphasize the importance of accuracy (authenticity), while positive strategies place more emphasis on desirability. The tension between the need for authenticity (accuracy) and desirability has been observed in situations where significant and long-term social relationships are the goal of personal branding, such as in online dating (e.g., Ellison et al., 2006). However, it is largely unknown in situations of social-commercial exchanges (user-receiver—user-provider relationships) such as the sharing economy, especially when consumption occasions are expected to be less frequent (e.g., traveling for vacation).

Further, in addition to the competing desires for accuracy and desirability (honest vs. positive self-presentation), previous research utilizes Jones (1990) five strategies of self-presentation in interpersonal situations: ingratiation (i.e., expressing statements of modesty, saying mildly negative things about self and positive things about others, with the goal of being liked), competence (i.e., expressing skills, abilities, accomplishments, etc., with the goal of being perceived as qualified), intimidation (i.e., expressing threats or statements of anger, with the goal to gain power), exemplification (i.e., expressing ideological commitment, self sacrifice, and self discipline, with the goal of being perceived as morally superior), and supplication (i.e., expressing entreaties for help or self-deprecation, with the goal of appearing helpless). In the context of online personal branding (e.g., through blogs or personal websites), previous research identified the dominance of ingratiation as a foremost used strategy among different user profiles (e.g., Bortree, 2005), followed by competence. The unique position of peer-to-peer accommodation hosts, as a host (personal) and as a part of a company (an Airbnb host), signifies the importance of exploring these different self-presentation strategies in relation to the company brand.

### 3 Methodology

To explore how peer-to-peer accommodation hosts articulate their identity online, textual data containing descriptions of Airbnb hosts in New York were extracted from a third party website, *Inside* (2015), which were sourced from publicly



available information on Airbnb website on June 1, 2015. In order to analyse the underlying self-presentation tactics among hosts in relation to their behaviour, listings, and guest evaluation, this study excluded host descriptions with missing information (i.e., host acceptance rate, host response rate, host response time, listing price, property types, location, and ratings). As a result, host descriptions from 12,785 Airbnb listings are included in the analysis.

The first step of the text analysis was to pre-process the text corpus, which includes breaking a stream of text into tokens, eliminating stop words, part-of-speech (POS) tagging (i.e., categorization of words with similar grammatical properties into noun, verb, adjective, etc.), and grouping together the different inflected forms of a word into its lemma. The pre-processing was conducted using *Stanford POS Tagger* (Toutanova, Klein, Manning, & Singer, 2003). The host descriptions consist of 897,175 tokens and 22,107 word types. After eliminating common words, the mean of term frequency (TF) is 25.24 (on average, words appear 25.24 times in the corpus) with a standard deviation of 399.40.

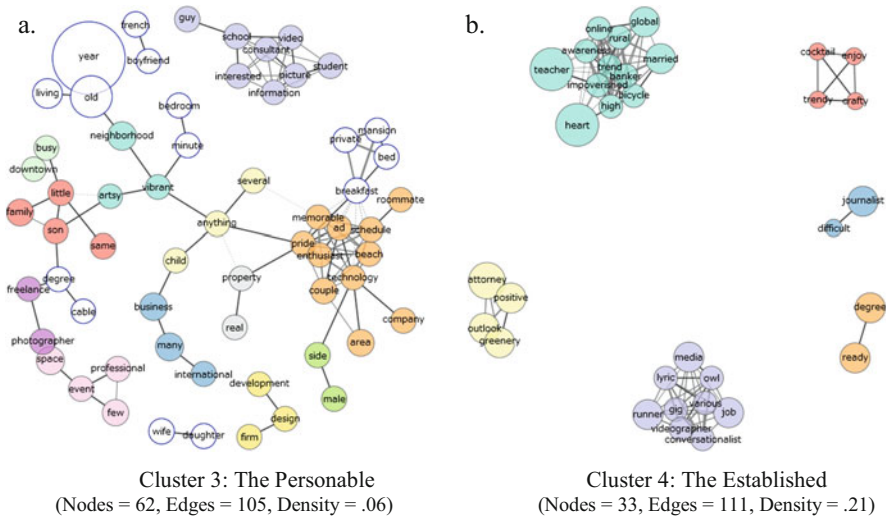
The second step was to identify the differences in how Airbnb hosts articulate themselves online using a hierarchical cluster analysis with Ward's criterion and Jaccard Coefficient as distance measure (Romesburg, 1984). In order to better understand the clusters of host descriptions, high frequency keywords (i.e., nouns and adjectives) associated with each cluster as well as their distribution were analysed. Word co-occurrence networks were developed using Jaccard Coefficients to determine the edges and Fruchterman and Reingold's (1991) algorithm to determine the layout of the network. Finally, the differences between host description clusters were explored using cross-tabulation (with chi-square tests) and independent-samples *t*-tests to obtain specific characteristics that explain different host self-presentation tactics. These analyses were conducted using *KH Coder* software (Higuchi, 2015) as well as *R* and *SPSS* statistical packages.

## 4 Results and Discussion

### 4.1 Clusters of Host Self-presentation

Based on a hierarchical cluster analysis with nouns and adjectives having a minimum TF of 500 (a total of 67), five meaningful clusters of host descriptions were identified, which reflect different attributes of hosts articulated online. The first cluster (labelled: The Global Citizen) contains host descriptions of 2017 Airbnb listings. The high frequency keywords in this cluster include *new*, *people*, *world*, *culture*, and *different*, which represent the openness of the hosts to welcome guests from different parts of the world, highlighting their eagerness to meet new people from different cultural backgrounds. In addition to *new* and *different*, adjectives used in the host descriptions are mostly positive: *amazing*, *best*, *comfortable*, and *clean*, which are used to describe others (e.g., listings). The network of high



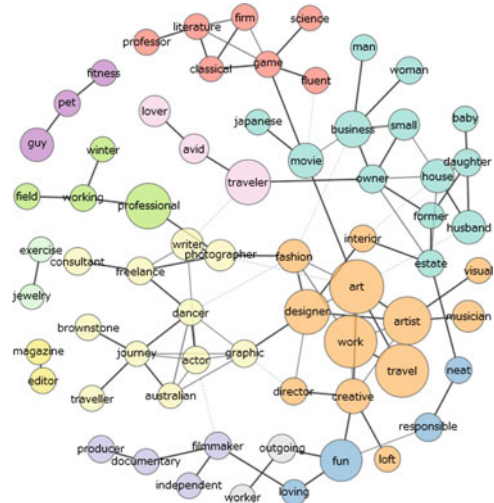


**Fig. 2** Word co-occurrence networks in clusters 3 and 4. **(a)** Cluster 3: the personable (Nodes = 62, Edges = 105, Density = 0.06). **(b)** Cluster 4: the established (Nodes = 33, Edges = 111, Density = 0.21)

woman, and couple. Adjectives used in this clusters are not entirely positive (e.g., busy, little, vibrant, artsy) and mostly attached to aspects other than the hosts. By presenting themselves in these terms, guests are communicating non-specific, but more personable brand to prospective guests as regular people trying to monetize their spare space. The network of high frequency keywords in this cluster is presented in Fig. 2a. The network consists of many word communities, some of them detached from others, indicating that there is no single major theme, but random facts about the hosts.

The fourth cluster (labelled: The Established) contains host descriptions of a small number Airbnb listing (a total of 186). Hosts within this cluster highlight their professional occupation, education, and geographic areas of origin/heritage, with keywords such as teacher, attorney, banker, and degree, as well as global, Australian, Italian, and rural. Hosts in this cluster communicate the image of individuals with a certain level of achievement, as reflected in what they do professionally and as foreigners (or someone originating from rural areas) living their dreams in New York City. Additionally, nationality/heritage information presented in host description may appeal to international guests originating from the same geographic areas. The adjectives used in this clusters are not entirely positive (e.g., difficult, ready, positive, high), indicating flair of authenticity. While the strategy in this cluster can be identified as competence, it also indicates honest self-presentation. The word co-occurrence network in this cluster is presented in Fig. 2b. It is noteworthy that the network represents isolated word communities with weak connections among them.

**Fig. 3** Word co-occurrence network in Cluster 5: the creative (Nodes = 67, Edges = 100, Density = 0.04)



(Nodes = 67, Edges = 100, Density = .04)

Finally, the last cluster (labelled: The Creative) includes the largest number of host descriptions from 4356 Airbnb listings. The hosts in this cluster describe themselves in terms of professional occupation or interests in different areas within the creative industry. Some of the high frequency keywords include *artist*, *writer*, *musician*, *fashion*, *designer*, *creative*, and *filmmaker*. Adjectives used in the cluster are mostly positive and attached to the hosts (e.g., *fun*, *loving*, *outgoing*, *fluent*, *neat*, *responsible*), indicating positive self-presentation tactics. Included in the high frequency keywords are interests in gaming, language, literature, etc. Central to the network (see Fig. 3) is the theme of art, entertainment, and literature, as well as an image of a fun and fit person, and a word community around family profiles (e.g., *husband*, *daughter*, *baby*).

### 4.2 Host Clusters, Host Behaviour, and Listing

Table 1 presents the summary of each of host clusters in terms of behaviour that is considered crucial in communication with prospective guests (i.e., acceptance rate, response rate, and response time) and the characteristics of their listings (i.e., average price and property types). The acceptance rate (i.e., the percentage of booking requests accepted by hosts) is relatively similar across different host clusters. However, the response rate (i.e., the percentage of messages being responded by hosts) among hosts in Cluster 4 (at 85.56 %) is slightly lower than the other clusters. Indeed, based on a series of independent-samples *t*-tests, the low response rate of hosts in Cluster 4 is statistically significant when compared to other clusters [with Cluster 1 ( $t = 3.76$ ;  $p < 0.001$ ), Cluster 2 ( $t = 3.13$ ;  $p < 0.01$ ), and

**Table 1** Host behaviour and listing across host clusters

	Cluster 1 (N = 2017)	Cluster 2 (N = 4206)	Cluster 3 (N = 474)	Cluster 4 (N = 186)	Cluster 5 (N = 4536)
<b>Host behaviour</b>					
<i>Acceptance rate</i>	89.42 %	88.52 %	86.72 %	88.55 %	88.45 %
<i>Response rate</i>	89.91 %	89.28 %	88.70 %	85.56 %	88.76 %
<i>Response time:</i>					
– <i>Within an hour</i>	32.62 %	30.82 %	25.32 %	23.50 %	29.76 %
– <i>Within a few hours</i>	41.00 %	39.09 %	42.83 %	38.80 %	37.19 %
– <i>Within a day</i>	24.19 %	27.15 %	28.27 %	33.33 %	26.26 %
– <i>A few days or more</i>	2.13 %	2.90 %	3.58 %	6.01 %	2.82 %
<b>Listing</b>					
<i>Average price (US\$)</i>	\$161.55	\$159.07	\$167.24	\$98.07	\$119.32
<i>Property type:</i>					
– <i>Entire home/apt</i>	61.77 %	58.86 %	64.98 %	64.48 %	55.95 %
– <i>Private room</i>	35.69 %	39.32 %	33.75 %	34.97 %	37.06 %
– <i>Shared room</i>	2.53 %	1.81 %	1.26 %	2.18 %	2.34 %
<i>Location:</i>					
– <i>Manhattan</i>	57.56 %	55.21 %	56.12 %	50.54 %	53.00 %
– <i>Others</i>	42.44 %	44.79 %	43.88 %	49.46 %	47.00 %

Cluster 5 ( $t=2.64$ ;  $p < 0.01$ )]. Based on a chi-square test, the host response times (i.e., how long it takes for hosts to respond to messages from prospective guests) significantly differ across clusters (Pearson Chi-square = 62.48,  $p < 0.001$ ). Hosts in Cluster 4 seemingly respond to messages a little slower than other clusters (i.e., with higher percentages of hosts who respond within a day or a few days/more).

In terms of property types, the majority of listings are for an entire home/apartment: the highest at about 65 % among hosts in Clusters 3 and 4 and the lowest at 56 % among hosts in Cluster 5. No statistically significant difference was found with regards to property types between clusters. In terms of price, Cluster 4 has the lowest average listing price at \$98.07 and Cluster 3 has the highest at \$167.24. A little more than half of the listings from all clusters are centrally located in Manhattan; the percentage of listings located in Manhattan is slightly lower in Cluster 4 (50.54 %). In summary, hosts in Cluster 4 (i.e., The Established), which are rather small in proportion, are notably different from other hosts in terms of their behaviour (i.e., lower response rate and slower response time) and pricing of their listings (i.e., lower prices).

### 4.3 Host Clusters and Guest Review Ratings

In order to explore if different host clusters (i.e., self-presentation tactics) are associated with lower or higher review ratings from their guests, a summary of the mean scores of review ratings (on a scale of 1–5) for different aspects of guest experiences at peer-to-peer accommodation (i.e., overall, accuracy, cleanliness, check-in, communication, location, and value) is presented in Table 2. It is noteworthy that only ratings on accuracy and communication have direct association with hosts, while other aspects (e.g., location, value, cleanliness) are related to the property. It is also noteworthy that the average ratings for all Airbnb listings in this study are extremely high for all aspects of the experience: overall ( $M = 4.60$ ;  $s.d. = 0.36$ ), accuracy ( $M = 4.69$ ,  $s.d. = 0.39$ ), cleanliness ( $M = 4.51$ ,  $s.d. = 0.51$ ), check-in ( $M = 4.80$ ,  $s.d. = 0.33$ ), communication ( $M = 4.83$ ,  $s.d. = 0.31$ ), location ( $M = 4.63$ ,  $s.d. = 0.44$ ), and value ( $M = 4.56$ ,  $s.d. = 0.39$ ). This is consistent with Zervas, Proserpio, and Byers (2015) study, which found consumer ratings on Airbnb to be higher than those on other online review sites, even for the same properties (i.e., based on properties cross-listed on Airbnb and TripAdvisor).

As can be seen in Table 2, guest ratings among Clusters 1, 2, 3, and 5 are nearly the same as the average scores for the entire listings. However, listings in Cluster 4 receive higher scores in overall, accuracy, cleanliness, and value. Notably, the score for accuracy in Cluster 4 is significantly higher than that of other clusters [based on independent-samples  $t$ -tests: with Cluster 1 ( $t = 2.68$ ;  $p < 0.01$ ), Cluster 2 ( $t = 2.58$ ;  $p < 0.01$ ), and Cluster 5 ( $t = 2.67$ ;  $p < 0.01$ )]. Since accuracy refers to the match between how hosts describe their listing online (i.e., guest online evaluation) and the real conditions/features of the listings (i.e., guest offline evaluation), it confirms that guests also perceive that the hosts in Cluster 4 are honest

**Table 2** Host clusters and guest ratings

Guest ratings	Cluster 1 (N = 2017)	Cluster 2 (N = 4206)	Cluster 3 (N = 474)	Cluster 4 (N = 186)	Cluster 5 (N = 4536)
Overall	4.59 (0.37)	4.60 (0.36)	4.60 (0.35)	4.65 (0.32)	4.60 (0.36)
Accuracy	4.69 (0.40)	4.69 (0.38)	4.70 (0.38)	4.77 (0.32)	4.69 (0.40)
Cleanliness	4.51 (0.49)	4.51 (0.51)	4.51 (0.52)	4.55 (0.54)	4.51 (0.51)
Check-in	4.79 (0.32)	4.80 (0.34)	4.79 (0.34)	4.81 (0.33)	4.80 (0.33)
Communication	4.83 (0.31)	4.83 (0.33)	4.84 (0.29)	4.84 (0.30)	4.83 (0.31)
Location	4.64 (0.43)	4.62 (0.44)	4.64 (0.41)	4.65 (0.42)	4.62 (0.43)
Value	4.55 (0.38)	4.56 (0.39)	4.56 (0.39)	4.61 (0.40)	4.55 (0.39)

(or authentic) in presenting their personal brand. Finally, consistent with the lower listing price, the score for listings in Cluster 4 is higher in terms of value.

In summary, regardless of host self-presentation strategies, all hosts seem to receive high scores in guest evaluation, with the exception of a small number of hosts in Cluster 4 who received even higher scores. Interestingly, while they are slightly less responsive to prospective guests, they received similar ratings in terms of communication. This is most likely due to the fact that prospective guests whom the hosts did not respond to were never converted into real guests and, hence, did not evaluate the hosts. As reflected in the higher score for accuracy, it is confirmed that in the socioeconomic (commercial) relationship contexts where modality switch occurs (i.e., online first then offline), accuracy is key to personal branding. That is, as guests develop service expectation based on the communication cues presented online by hosts, whether or not these cues are later confirmed during service delivery (i.e., direct host—guest interactions) shape guest experience and evaluation, which, in turn, also contribute to lasting impression management and personal brand.

## 5 Conclusion and Implication

In an attempt to better understand different strategies that peer-to-peer accommodation hosts use to attract prospective guests, this study explored how hosts articulate their profile online to obtain underlying self-presentation tactics. Using a hierarchical cluster analysis on textual data containing host descriptions of Airbnb listings, five clusters of host descriptions were identified: The Global Citizen, The Local Expert, The Personable, The Established, and The Creative. Using the framework of personal branding and self-presentation, high frequency nouns and adjectives from these clusters were examined to determine the strategic use of these words for host branding. It is apparent that, from the high frequency adjectives, hosts in Cluster 5 utilize positive self-presentation while those in Clusters 3 and 4 are rather honest (due to the presence of negative description of aspects of self and listing). From Jones (1990) categories of self-presentation tactics, only competence

strategy was observed from the clusters (in Cluster 2 and Cluster 4) where the hosts describe themselves in regard of their expertise and competence as a host. While all of the clusters suggest efforts dedicated to personal branding (i.e., focusing on self as a person) more than to brand advocacy for the company (i.e., focusing on self as a part of Airbnb network). References to self as “providers” were apparent only in Cluster 2, where hosts communicate their “host-ness” as personal brand identity.

The majority of the hosts were classified into Clusters 1, 2, and 5 based on their self-presentation, with a small number in Clusters 3 and 4. However, Cluster 4 (the smallest in number) is the most unique in terms of their behaviour, listing, and guest review ratings. Hosts in Cluster 4 (The Established) have lower average response rate and slower response time when compared to other clusters, indicating that they are less responsive to prospective guests. Despite this, they received a high score for communication from their guests, which is comparable to other clusters. Listings in Cluster 4 are notably lower in price and, hence, they received higher review score for value. Importantly for personal branding, listings in Cluster 4 received significantly higher score in terms of accuracy, which represents consistency between what they describe online (i.e., online evaluation) and the reality (i.e., offline evaluation). This signifies the importance of honest self-presentation in such commercial/social exchange platform. Since host—guest interactions are considered important in the sharing economy [and one of the benefits sought by guests (e.g., Botsman & Rogers, 2011; Tussyadiah, 2015)], it is important for hosts to present themselves in a more authentic way to ensure a consistent image after the modality switch from online to offline.

This study demonstrates the significance of assessing strategic efforts in a peer-to-peer, commercial sharing platform, a venue where company branding and personal branding overlap. Because of the infancy of this research area, this study presents opportunities for further examination into this topic. Utilizing text analysis software (i.e., automation of text processing) allows this study to analyse a large number of observation, compared to other studies on personal branding and self-presentation. However, there are limitations inherent to relying on algorithm to process textual data written in natural languages, such as unobserved nuances, sarcasm, etc. Further, the textual data used in this study are snapshots of host profiles at a point in time and, therefore, do not reflect the dynamics of self-presentation in cases where hosts update their profile and possibly alter their self-presentation tactics. Additionally, host description plays an important role in shaping host brand during the initiation of interactions. This is typically reinforced during follow-up interactions with prospective guests (i.e., by exchanging private messages) where additional communication cues are given (or given off). These follow-up interactions that occur privately are not available to aid in the confirmation of host branding strategies. Finally, the nature of on-demand economy, where the decision when to make properties available is fully at the discretion of the hosts, determining a reliable measure of success for different host branding strategies remains a challenge. This is due to the complexity and inconsistencies attached to such measures as number of reviews, monthly availability (occupancy), review ratings, etc. To address some of these issues, future research should assess the



consistency between personal brand promise and brand image as observed in consumer reviews, by comparing how hosts describe themselves and how they are described in guest reviews.

## References

- Belk, R. (2014). You are what you can access: Sharing and collaborative consumption online. *Journal of Business Research*, 67(8), 1595–1600.
- Belotti, V., Ambard, A., Turner, D., Gossman, C., Demkova, K., & Carroll, J. M. (2015). A muddle of models of motivation for using peer-to-peer economy systems. In *Proceedings of CHI 2015 conference*, Crossings, South Korea.
- Bortree, D. S. (2005). Presentation of self on the web: An ethnographic study of teenage girls' weblogs. *Education, Communication & Information*, 5(1), 25–39.
- Botsman, R., & Rogers, R. (2011). *What's mine is yours: The rise of collaborative consumption*. New York: Harper Business.
- Chen, C.-P. (2013). Exploring personal branding on YouTube. *Journal of Internet Commerce*, 12(4), 332–347.
- Dominick, J. R. (1999). Who do you think you are? Personal home pages and self-presentation on the World Wide Web. *Journalism and Mass Communication Quarterly*, 76(4), 646–658.
- Ellison, N., Heino, R., & Gibbs, J. (2006). Managing impressions online: Self-presentation process in the online dating environment. *Journal of Computer-Mediated Communication*, 11, 415–441.
- Fruchterman, T. M. J., & Reingold, E. M. (1991). Graph drawing by force-directed placement. *Software - Practice and Experience*, 21(11), 1129–1164.
- Gibbs, J. L., Ellison, N. B., & Heino, R. D. (2006). Self-presentation in online personals: The role of anticipated future interaction, self-disclosure, and perceived success in Internet dating. *Communication Research*, 33(2), 152–177.
- Goffman, E. (1990). *The presentation of self in everyday life*. London: Penguin.
- Hamari, J., Sjöklint, M., & Ukkonen, A. (2013). *The sharing economy: Why people participate in collaborative consumption*. Working paper. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2271971](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2271971)
- Higuchi, K. (2015). *KH Coder 2.x reference manual*. Retrieved from [http://khc.sourceforge.net/en/manual\\_en\\_v2.pdf](http://khc.sourceforge.net/en/manual_en_v2.pdf)
- Inside Airbnb. (2015). *Get the data*. Retrieved from <http://insideairbnb.com/get-the-data.html>
- Jones, E. E. (1990). *Interpersonal perception*. New York: W. H. Freeman.
- Kim, J., & Lee, J. R. (2011). The Facebook paths to happiness: Effects of the number of Facebook friends and self-presentation on subjective well-being. *Cyberpsychology, Behavior and Social Networking*, 14(6), 359–364.
- Kim, J., & Tussyadiah, I. P. (2013). Social networking and social support in tourism experience: The moderating role of online self-presentation strategies. *Journal of Travel & Tourism Marketing*, 30(1–2), 78–92.
- Kim, J., Yoon, Y., & Zo, H. (2015). Why people participate in the sharing economy: A social exchange perspective. In *PACIS 2015 proceedings (Paper 76)*. Retrieved from <http://aisel.aisnet.org/pacis2015/76>
- Labrecque, L. I., Markos, E. C., & Milne, G. R. (2011). Online personal branding: Processes, challenges, and implications. *Journal of Interactive Marketing*, 25(1), 37–50.
- Möhlmann, M. (2015). Collaborative consumption: Determinants of satisfaction and the likelihood of using a sharing economy option again. *Journal of Consumer Behaviour*. doi:10.1002/cb.1512 (OnlineFirst).

- Pons, P., & Latapy, M. (2005). *Computing communities in large networks using random walks*. Retrieved from <http://arxiv.org/pdf/physics/0512106v1.pdf>
- Romesburg, H. C. (1984). *Cluster analysis for researchers*. Belmont: Lifetime Learning Publications.
- Sanderson, J. (2008). The blog is serving its purpose: Self-presentation strategies on 38pitches.com. *Journal of Computer-Mediated Communication*, 13, 912–936.
- Schwabel, D. (2009). *Me 2.0: A powerful way to achieve brand success*. New York: Kaplan Publishers.
- Shepherd, I. D. H. (2005). From Cattle and Coke to Charlie: Meeting the challenge of self marketing and personal branding. *Journal of Marketing Management*, 21, 589–606.
- Toma, C., Hancock, J., & Ellison, N. (2008). Separating fact from fiction: An examination of deceptive self-presentation in online dating profiles. *Personality and Social Psychology Bulletin*, 34, 1023–1036.
- Toutanova, K., Klein, D., Manning, C., & Singer, Y. (2003). Feature-rich part-of-speech tagging with a cyclic dependency network. In *Proceedings of HLT-NAACL 2003* (pp. 252–259). Retrieved from <http://nlp.stanford.edu/pubs/tagging.pdf>
- Trammel, K. D., & Keshelashvili, A. (2005). Examining the new influences: A self-presentation study of A-list blogs. *Journalism & Mass Communication Quarterly*, 82(4), 968–982.
- Tussyadiah, I. P. (2015). An exploratory study on drivers and deterrents of collaborative consumption in travel. In I. Tussyadiah & A. Inversini (Eds.), *Information & communication technologies in tourism 2015* (pp. 819–832). Switzerland: Springer.
- Tussyadiah, I. P., & Pesonen, J. (2015). Impacts of peer-to-peer accommodation use on travel pattern. *Journal of Travel Research*. doi:10.1177/0047287515608505.
- Walther, J. B. (1992). Interpersonal effects in computer-mediated interactions: A relational perspective. *Communication Research*, 19(1), 52–91.
- Walther, J. B. (2007). Selective self-presentation in computer-mediated communication: Hyper personal dimensions of technology, language, and cognition. *Computers in Human Behavior*, 23, 2538–2557.
- Walther, J. B., & Burgoon, J. K. (1992). Relational communication in computer-mediated interaction. *Human Communication Research*, 19(1), 50–88.
- Zervas, G., Proserpio, D., & Byers, J. (2015). *A first look at online reputation on Airbnb, where every stay is above average*. Working paper. Retrieved from <http://ssrn.com/abstract=2554500>

# Forecasting the Final Penetration Rate of Online Travel Agencies in Different Hotel Segments

Miriam Scaglione and Roland Schegg

**Abstract** This research uses data on distribution channels of hotels gathered through a yearly survey addressed to Swiss hotels since 2006. The authors use the evolution of Online Travel Agencies (OTAs) market share as a time series which can be modelled using different growth curve methods. These various models cross-validate the forecasted final penetration rate. The study analyses the dynamics of the evolution of OTAs and determines their final penetration rate not only on an overall level, but also segmented by hotel category, location and size. Overall, a final penetration of around 35 % is predicted by our models, but they show also that the level of final penetration of OTAs depends on the typology of the hotel. The paper sheds some light on the statistical difficulties in forecasting with a limited set of data and gives insights into the future evolution of the distribution mix which is essential for the marketing and pricing strategy of hotels.

**Keywords** Online travel agency (OTA) • Swiss hotel, distribution channel, Bass model • Growth model • Final market penetration, forecast

## 1 Introduction

Information and Communication Technologies (ICT) have been acknowledged (cf. Buhalis, 2003, p. 338) as being key tools for marketing and distribution in tourism for quite some time. Actually, not only do they offer opportunities in terms of information diffusion and communication (24\*7\*365), but they also broaden selling opportunities for hotels. Managers of hotels recognize that the Internet can give added value (Buhalis, 2003; Werthner & Klein, 1999) to their properties if they manage it appropriately and skilfully. Yet, these opportunities come with several drawbacks such as increasing costs of distribution and a dynamically evolving distribution landscape with a high level of complexity (Kracht & Wang, 2010).

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In the hospitality industry, online intermediaries such as Online Travel Agencies (OTA) play nowadays a significant role in the distribution of rooms on a global scale (Ku & Fan, 2009). Online hotel sales in Europe accounted for US\$36 billion in 2013, a fourth of total hotel sales (Euromonitor, 2014). At the same time, the distribution landscape is moving towards consolidation as OTAs acquire local brands but focus also on metasearch (PhoCusWright, 2014). Expedia and Priceline still dominate this market due to organic growth and acquisitions, yet they could be challenged in the future by emerging players, including technology companies or generalist retailers (Rossini, 2015).

With the exception of the works by O'Connor and Frew (2002), Schegg and Scaglione (2013) and Scaglione and Schegg (2015) there is few research focusing on the future evolution of the distribution landscape in the hotel sector. The aim of this research is thus to gain an understanding of the dynamics of distribution channels and specifically to forecast the evolution of market shares of OTAs in hotel segments (such as hotel category, size or location) in Switzerland. In addition, the study uses different forecasting models given that only six observation are available (2006–2012), therefore a cross-validation of the final rate is necessary.

## 2 Literature Review

The following literature review deals with setting the context of the study by discussing the development of online distribution and power shifts in distribution networks. In a second part the fundamentals of growth models are discussed in helping to understand past and future market dynamics such as the evolution of OTA market shares through time.

### 2.1 *The Rise of Online Intermediaries in Hotel Distribution*

The rise of ICTs radically reshaped the demand and supply patterns within the whole travel industry (Buhalis, 2003). Technology help firms to leverage opportunities (market access, customer engagement, new distribution channels, etc.) arising with the broad diffusion of ICT especially when market forces are dynamic in nature. As the Internet has gained in dynamics, hotel chains have begun in an early stage to engage in e-marketing and e-commerce activities using technology to promote distribution options through dynamic inventory and pricing management (Irvine & Anderson, 2008). Hotels are using various (online) distribution channels to increase their market visibility in order to foster (online) purchasing (Buhalis, 1999; Kang, Brewer, & Baloglu, 2007). Yet, it can be observed that (independent) hoteliers have been quite reluctant in adopting new technologies (Law & Jogaratnam, 2005). As indicated by Buhalis (2003, p. 221) the hospitality sector is “the most under-automated segment of the international travel industry” and the

vast advantages the web can bring are not really leveraged properly. This is probably also reflected in the steadily decreasing proportion of traditional channels (e.g. mail, phone and fax) in the distribution mix of hotels, seen as inefficient and expensive by both hoteliers and final customers (O'Connor, 2001), and the high growth rates of bookings through OTAs which could multiply their market share within the last years (Schegg, Stangl, Fux, & Inversini, 2013).

OTAs have been entering the market (Gazzoli, Kim, & Palakurthi, 2008) since the end of the 1990s, increasing thereby the complexity of the online distribution landscape (Kracht & Wang, 2010). Staying ahead of the technology curve has been an important strategy for OTAs. They have become powerful and relevant distribution partners for hotels owing among other reasons to a superior product choice to the traveler (Morosan & Jeong, 2008; Runfola, Rosati, & Guercini, 2013).

Hotels use multiple online and offline channels to maximize exposure and market share (Toh, Raven, & DeKay, 2011). Yet, this expansion puts hotels in the difficult position of having to sell large portions of their inventory with high commission rates through third party intermediaries (Caroll & Siguaw, 2003). Hotel managers would favour to sell their room inventory directly to the customer, and they see OTAs often as distribution competitors—even though they are aware that OTAs can generate high booking volumes (Anderson, 2011). Therefore, OTAs remain a crucial issue in the online distribution strategy of the hotel sector. The dominance of OTAs could however be challenged in the next years by new emerging players (e.g. Rossini, 2015) as the future development in the travel distribution environment may more and more concern technology companies such as Google and TripAdvisor. Analysts believe that these emergent players in the distribution landscape move from a media model to a transactional model in online travel, with consumers requiring seamless transactions rather than being redirected to the external sites of travel intermediaries (e.g. Rossini, 2015; Schaal, 2015).

Many believed in the past that ICTs would enable independent hotel properties to compete directly with large hotel chains and OTAs for direct business thus lowering high costs of transactions (Caroll & Siguaw, 2003). However, the increasingly complex e-commerce market place has made the efficient marketing of rooms and rates, across the different distribution channels an ever increasing difficult task (Thompson, 2005). OTAs are putting price and convenience (one-stop shop) at the center of their marketing strategies, making rational product design, pricing and rate parity fundamental approaches in contemporary hospitality (Varini, Scaglione, & Schegg, 2011). As online marketing and distribution in the lodging sector has grown in complexity, attracting consumer to direct channels requires well developed online customer acquisition and engagement strategies. Hotels have probably underrated the significance of an effective online marketing strategy in the past whereas OTAs have spent resources in online marketing and aggressive conversion techniques (Egger & Buhalis, 2008).

The fact that online intermediaries today play a crucial role in the sales process of hotel rooms changes the opportunities that small- and medium-sized independent hotels have to maximize profits (Varini et al., 2011). As a consequence, the

common view of many hoteliers is that OTAs and other emerging players will increasingly dominate the distribution landscape and disadvantage hotels in many aspects (limitation of entrepreneurial freedom due to clauses on rate, availability and product parity, decreasing profit margins due to high commission rates, etc.).

Hotel managers have to develop their distribution and sales channel strategy but are confronted with the problem of choosing the ideal mix of channels for the hotel, given a limited amount of time, resources, and information. Understanding the market dynamics and the (future) key players is therefore an essential issue for academics and practitioners.

## ***2.2 Growth Curve Methods as Tools to Forecast OTA Market Shares***

Growth curve methods emerged in the frame of technological forecasting to predict the pattern of substitution or introduction of new technologies (Young & Ord, 1985). Past researches (Scaglione & Schegg, 2015; Schegg & Scaglione, 2013) in the hospitality domain used a multi-channel approach to forecast market shares. The studies were based on the evolution of three generations of distribution channels proposed by Kratch and Wang (2010):

- Generation 1 (traditional channels): Telephone, fax, letter, travel agency, tour operator, DMO (local, regional or national), 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): OTAs, social media channel.

Using the model of Fischer and Pry (1971), Schegg and Scaglione (2013) stated that the last generation (G3) would reach 50 % of the total share of bookings in 2019 and that the speed of substitution of it is six time greater than the second generation. Scaglione and Schegg (2015) suggest that the adoption of generation 1 and 2 have been mostly driven by innovation or external influence whereas generation 3 seems to be controlled by a mixed effect of innovation and imitation.

An analysis on website diffusion among Swiss hotels, an element of generation 2, showed that competitive tourism regions (such as Graubünden or Geneva) had higher website penetration rates than other regions (Schegg, Steiner, Frey, & Murphy, 2002). Likewise, Scaglione, Schegg, Steiner, & Murphy (2004b) confirmed a significant relationship between location and domain name adoption as city hotels adopted domain names significantly earlier than properties in other locations. According to Scaglione, Schegg, Steiner, & Murphy (2004a), there is a positive relationship between three other hotel characteristics and domain name adoption: hotel size, affiliation and category. Given the relationship between organisational characteristics and adoption of innovation, probably due to their

structural differences (size, management structure, affiliation etc.) (cf. Perruchoud-Massy, Scaglione, Schegg, & Murphy, 2005), this research tests the dynamics of OTA adoption across different accommodation types. In this research we use three different models to assess the future market shares of OTAs in different market segments of the Swiss hotel sector.

The **Bass (1969) model** expanded Rogers’ (1962) ‘Diffusion of Innovations’ model by quantifying two factors that drive individual and organizational adoption: innovation ( $p$ ) driven by external channels such as mass communication and imitation ( $q$ ) driven by intrapersonal communication such as word-of-mouth. Bass’s model (1969) calculates innovation specific and usually abnormally shaped distribution and adoption curves. This non-cumulative distribution curve has three important values that set the adopter categories. The inflexion point  $T_1$  separates the early adopters and early majority categories. Next, the peak of absolute adoption  $T$  demarcates the early majority and late majority categories. Finally, the second inflexion point  $T_2$  delineates the late majority and laggards.

The probability density function as shown in Eq. 1 (Bass, 1969; Mahajan, Muller, & Srivastava, 1990; Srinivasan & Mason, 1986):

$$f(t) = (p + qF(t))(1 - F(t)) \tag{1}$$

$F(t)$  is the number of cumulative adopters at time  $t$  and  $f(t)$  is the derivate of  $F(t)$ , the diffusion begins at  $t = 1$ . The estimation of inflection point  $T^*$  of the cumulative curve is using Eq. 2 (Mahajan et al., 1990):

$$T^* = \log(q/p)/(p + q) \tag{2}$$

The **Bemmaor model** can be considered as a special case of the micro-modelling approach (Meade & Islam, 2006). Bemmaor and Lee consider a population of individuals, where each individual’s probability of adoption is given by a shifted Gompertz density function (G/SG—Gamma/shifted Gompertz). The estimation used in this study is based on the closed formula of Eq. 3 below. We have estimated  $T^*$  of Bemmaor’s distribution using the equation in Bemmaor & Lee (2002, Appendice):

$$F(t) = [1 - e^{-bt}]/[1 + \beta e^{-bt}]^\alpha \tag{3}$$

The **logistic adoption model** was initially proposed by Mansfield (1961) when he analyzed the diffusion of industrial products. The model can be written as follows (Bass, Jain, & Khishnan, 2000):

$$Y(t) = \frac{L}{1 + e^{-(a+bt)}} \tag{4}$$

Where  $Y(t)$  is the number of cumulative adopters at time  $t$  and  $L$  is the size of the final market.

The logistic model is a special case of the Bass model when innovation parameter  $p = 0$  and the imitation parameter  $q$  of the Bass model turns out to be the equal to  $b$  in the logistic model. The logistic distribution is symmetric and its peak,  $T^*$ , is the abscise of  $F(t^*) = L/2$ , close to the peak of the Bass, but slightly to the right or further.

### 3 Data and Methodology

This research will consider the evolution of the market share of OTAs as a process of diffusion of a new technology by analysing the evolution of the market shares (demand side) of OTAs (in % of the overall booking mix of Swiss hotels). The different growth methods discussed in the previous chapter have been used in this study. The reasons for using this strategy are twofold. On the one hand, the time series is still short with only seven data points between 2006 and 2012 (data for 2007 are missing as no survey was conducted). On the other hand, the data are collected through an online survey resulting in fluctuating sample sizes over time and, for some hotel segments considered, the number of observations is low. The use of different diffusion models allows a procedure of choice of the best method based on established criteria.

Data was gathered through an online survey addressed to the members of *hotelleriesuisse*, the main trade organisation of the sector in Switzerland. The online questionnaire contained one question concerning how bookings are distributed among available direct and indirect distribution channels. Table 1 shows the evolution of the mean market share of OTAs for each reference year [details on data collection and descriptive results are from Schegg and Fux (2010), Schegg et al. (2013) and Scaglione and Schegg (2015)]. Unfortunately, there was no survey in 2007, which is why the authors have estimated this value using structural time series methods (Harvey, 1990). In 2013, the survey was run on a European level (Schegg, 2014). However, as the survey asked for the distribution of room nights (instead of bookings) by channel, results could not be integrated in the present study. The latest available data for the reference year 2014 (Schegg, 2015) were only used for validating purposes of forecasting models in the present analysis.

The analysis for all model parameters draws on the SAS V9 Nonlinear Least Square Proc Model procedure (SAS Institute Inc., 2011). The values of Adj-R2 are often extremely high and therefore not very informative. Thus, the authors decided to report the Sum of Square Errors (SSE) and Root Mean Square Errors. It is well known that these kinds of models suffer from collinearity effects (Meade & Islam, 2006).



**Table 1** List of parameters values and final share estimations of growth models

Classification	Method	Final market (%)	<i>p</i>	<i>q</i>	$\alpha$	<i>a</i> (Logistic)	<i>b</i> (Logistic)	<i>T</i> * (Peak Date)	SSE	Root MSE
<b>Overall</b>	Logistic	<b>36.29%</b> (13.74%)		<b>0.40662</b> (0.1741)		<b>-2.70648</b> (0.2515)	<b>0.428343</b> (0.0957)	2010	0.0003	0.0091
category	Logistic	<b>36.29%</b> (59.8644)		<b>0.428343</b> (0.0957)		<b>-2.70648</b> (0.2515)	<b>0.428343</b> (0.0957)	2010	0.0003	0.0091
	Logistic	<b>58.87%</b> (18.86)		<b>0.219743</b> (0.0203)		<b>-2.28071</b> (0.3268)	<b>0.219743</b> (0.0203)	2016	0.0289	0.1700
	Benmaor	31.19% (22.0107)			0.0000 n/a			2006	11.7618	1.7148
Size (rooms)	Logistic	<b>25.02%</b> (4.805)		<b>0.786005</b> (0.2897)		<b>-3.17904</b> (0.8281)	<b>0.786005</b> (0.2897)	2010	24.5409	2.4769
	Logistic	<b>31.00%</b> (11.4856)		<b>0.4557</b> (0.0957)		<b>-2.40033</b> (0.2713)	<b>0.4557</b> (0.1452)	2010	0.0003	0.0091
	Logistic	<b>17.60%</b> (2.0855)		<b>0.591649</b> (0.1091)		<b>-2.36177</b> (0.0.2338)	<b>0.591649</b> (0.1091)	2009	2.0082	0.7086
Locali zation	Logistic	<b>31.00%</b> (11.4856)		<b>0.4557</b> (0.0957)		<b>-2.40033</b> (0.2713)	<b>0.4557</b> (0.1452)	2012	0.0003	0.0091
	Benmaor	<b>29.19%</b> (11.5515)		<b>0.185201</b> (0.1207)	0.0000 n/a			n/a	4.8146	1.5516

Remark: In bold estimates significant at 1 %, 5 % or 10 %, in brackets standard deviation of the estimates

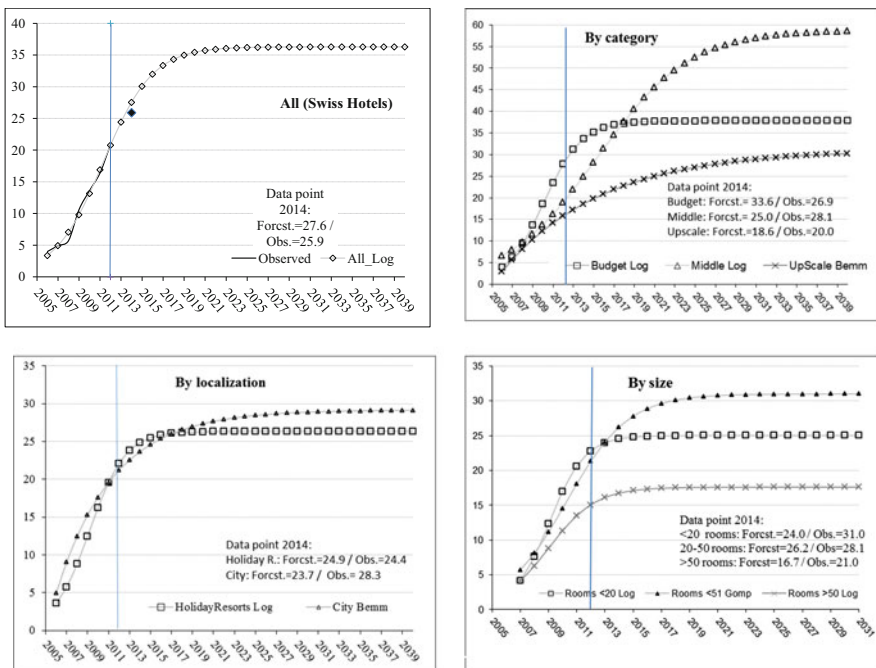
### 4 Results

Table 1 shows the model estimation results for the preferred model. In all cases where the standard deviation is not given in Table 1 (“n/a”), this means that the model has boundary constraint on those estimates. The criteria for the choice of the preferred final market share of a specific model are the following: Firstly, the final market share (%) has to be at least not boundary constrained (even if values are not statistically significant); secondly, the errors (SSE and Root MSE) should be minimal.

For the overall sample of all Swiss hotels, the best estimate for the final share of OTAs (36 %) is given by the Logistic Model—its confidence interval (CI) using Wald statistics at 95 % ranges from 9 % to 65 %. The peak of adoption is 2010 therefore the diffusion has already reached the category of late majority. Figure 1 shows the forecasted OTA market shares estimates using the Logistic Model.

**Analysis by Hotel Category** Except for upscale hotels, the logistic model yields the smallest errors for the market share estimations.

- In the case of budget hotels (0–2 stars), the final OTA market share is estimated at 36 % with a CI (28–63 %). The peak of adoption, according to the model was



**Fig. 1** Current and forecasted evolution of OTA market shares (in %) for hotels in Switzerland, vertical line in 2012 represents final observation of the model. The indicated values within the graph compare the observed OTA market share in 2014 to the forecasted value

reached in 2010. Therefore, also in this case, the process of diffusion is at the beginning of its mature phase.

- For middle class hotels, the final market share of OTAs is 59 % with a CI ranging from 22 % to 96 %. The peak of adoption is forecasted to be in 2016. That means that the diffusion is still in progress and that hotels of this segment can be situated in the early majority adoption class. The margin of progression is still high, given that the upper value of the CI is 96 %.
- Finally, for upscale hotels no model yields a significant value for the final market parameter. Except for Bemmaor, all others models have converged but with boundary constraint for the final market estimate. For this reason, the Bemmaor model is preferred even if the estimate is not significant ( $p\text{-value} = 0.22$ ). The CI ranges from 18 % to 74 %. The fact that all models failed to yield “an acceptable” diagnosis is probably due to sampling errors. Indeed, the category of upscale hotels is rather small and heterogeneous.

**Analysis by Hotel Size** Except for big hotels (i.e. more than 50 rooms), the best model is once more the Logistic Model. Figure 1 shows the time series of estimates for each modality for the preferred model.

- In the case of small-sized hotels (less than 20 rooms), the final share of OTAs is 25 % with a CI ranging from 23 % to 34 %. Peak of adoption was already reached in 2010 in all the models. The visual analysis of the graph shows that for budget category the progression is very rapid, whereas for middle class hotels the S-Shape is well-defined, showing that the booking behavior of clients of these hotels was probably more influenced by an imitation behavior than in other hotel segments. The OTA channel for small hotels has already entered the maturity phase, namely late majority.
- For mid-sized hotels (21–50 rooms); the final OTA market share is 31 % (CI: 22–53 %) and the diffusion process is, as in the case of small hotels, already in the late majority category.
- In the case of hotels having more than 50 rooms, the final OTA shares of models are quite similar. The logistic models yields 18 % and the CI is between 15 % and 22 %.

**Analysis by Localization of the Hotel** The best model for hotels in leisure resorts (lake/mountain) hotels is the Logistic Model. The final OTA market share is 25 % (CI: 20–41 %) and peak of adoption is 2011. This shows once more that the diffusion process seems to have already reached the mature phase of late majority. The adoption models of hotels situated in cities show poor diagnostic evaluation given that the final market parameter is boundary constrained, with the exception of the Bemmaor model. Thus, this model is preferred to the others. The final OTA share is 25 % and the CI is between 23 % and 51 %. Unfortunately, in this latter

case, no analysis of the maturity of diffusion is possible. Figure 1 shows the estimates for this latter typology.

Figure 1 shows the observed data for 2014 and Table 1 indicates the 95 % confidence interval and forecasted values for each hotel segment. In all cases, the observed values are inside the corresponding 95 % confidence interval. Therefore, a review of the choice of the best model seems not be necessary. The hotel segments having absolute errors (observed minus forecasted) greater than 5 % are hotels with less than 20 rooms (absolute error 6.5 %) and those with more than 50 rooms (absolute error 5.2 %).

## 5 Discussion and Conclusions

This research shows that except for mid-scale hotels with an estimated final penetration rate of more than 50 %, the final share for OTAs is below 40 %. Budget hotels have the highest OTA market share at the moment, but will reach the ceiling level soon, whereas upscale hotels might see a steadily increasing OTA market share for a long period. Three-star hotels constitute the majority (>50 %) of the members of *hotelleriesuisse* and are therefore an important element of the Swiss lodging sector. The foreseen very high market share of OTAs is therefore a serious threat for the lodging sector in Switzerland. Online intermediaries have become increasingly powerful and this development puts hotels in a difficult position. High dependency means loss of control (product, marketing) while the dominant intermediaries leverage increasingly market knowledge as they have the data and the know-how to gather insights on customer behaviour on a large scale (Toh et al., 2011). Hoteliers need to review their relationships and distribution partners to make sure that they maximize the share of value that can be gained from being part of a distribution network (Ford, Wang, & Vestal, 2012) and try to implement efficient direct booking strategies.

For all hotel segments under study with the exception of city hotels, the diffusion process has already reached Rogers' late majority category; therefore, they have entered the descending part of the diffusion curve. That means that, hereafter, the year-to-year (growth rates) evolution will decrease and no longer increase as it has up to now, unless OTAs or the merging new players find an innovation that allows them to launch a new cycle.

## 6 Limitations and Future Research

The poorer performance of some of the models in our study could be due to bias of estimates. Bias could arise when using nonlinear least square like in this case (Meade & Islam, 2006; Van den Bulte & Lilien, 1997). One of the reasons could be poor "signal-to-noise" ratio of the raw data. Another reason could be that bias is

higher “for recent than for all innovations” which could inflate the  $q$  parameter—the imitation parameter (Van den Bulte & Lilien, 1997, p. 349).

Therefore, these results have to be taken with caution because there are still few observations available. Scholars have pointed out and found on an empirical basis, that there is a downward bias in the estimates of the final market and an upward bias in the estimate of  $q$  in the case of the Bass model. This bias dismisses as data points increase and/or censoring data decrease (cf. Van den Bulte & Lilien, 1997, p. 338). Thus, the authors do not discuss the imitation/innovation drivers based on  $p$  and  $q$  estimates in the Bass model. Along the same lines, the discussion of homogeneity in the propensity of adoption seems also very improbable with the available data at the moment. Except for one model, the estimates of  $\alpha$  are not significantly different from zero, probably due to inflated variance obtained in the process under the effect of collinearity.

Finally, from the statistical point of view, specific types of hotels such as city and upscale turned out to be difficult for modelling purposes given the limited number of observations. In these two cases, hotels are a mix of independent and chain hotels. Probably this fact induces, in both cases, some noise in the data collection. Further research should be carried out aiming at discriminating these subtypes.

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## References

- Anderson, C. K. (2011). Search, OTAs, and online booking: An expanded analysis of the billboard effect. *Cornell Hospitality Report*, 11(8), 14.
- Bass, F. M. (1969). A new product growth model for consumer durables. *Management Science*, 15(5), 215–227.
- Bass, F. M., Jain, D., & Khishnan, T. (2000). Modeling the marketing-mix influence in new-product diffusion. In V. Mahajan, E. Muller, & Y. Wind (Eds.), *New-product diffusion models*. Boston, MA: Kluwer Academic.
- Bemmaor, A. C., & Lee, J. (2002). The impact of heterogeneity and ill-conditioning on diffusion model parameter estimates. *Marketing Science*, 21(2), 209–220.
- Buhalis, D. (1999). Information Technology for small and medium-sized tourism enterprises: Adaptation and benefits. *Journal of Information Technology & Tourism*, 2(2), 79–95. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0261517799000953>.
- Buhalis, D. (2003). *ETourism: Information technology for strategic tourism management*. Harlow: Financial Times Prentice Hall.
- Carroll, B., & Sigauw, J. (2003). The evolution of electronic distribution. *Cornell Hotel and Restaurant Administration Quarterly*, 44(4), 38–50.
- Egger, R., & Buhalis, D. (2008). *ETourism case studies: Management and marketing issues*. Oxford: Butterworth-Heinemann.
- Euromonitor. (2014). *The new online travel consumer – Featuring euromonitor international and the ETOA*. Retrieved from <http://aggregator.us/THE-NEW-ONLINE-TRAVEL-CONSUMER-ETOA-European.html>

- Fisher, J. C., & Pry, R. H. (1971). A simple substitution model of technological change. *Technological Forecasting and Social Change*, 3, 75–88. doi:10.1016/S0040-1625(71)80005-7.
- Ford, R. C., Wang, Y., & Vestal, A. (2012). Power asymmetries in tourism distribution networks. *Annals of Tourism Research*, 39(2), 755–779. doi:10.1016/j.annals.2011.10.001.
- Gazzoli, G., Kim, W. G., & Palakurthi, R. (2008). Online distribution strategies and competition: Are the global hotel companies getting it right? *International Journal of Contemporary Hospitality Management*, 20(4), 375–387. doi:10.1108/09596110810873499.
- Harvey, A. C. (1990). *Forecasting, structural time series models and the Kalman filter*. Cambridge: Cambridge university press.
- Irvine, W., & Anderson, A. R. (2008). ICT (Information communication technology), peripherality and smaller hospitality business in Scotland. *International Journal of Entrepreneurial Behaviour & Research*, 14(4), 200–218.
- Kang, B., Brewer, K. P., & Baloglu, S. (2007). Profitability and survivability of hotel distribution channels. *Journal of Travel & Tourism Marketing*, 22(1), 37–50. doi:10.1300/J073v22n01\_03.
- Kracht, J., & Wang, Y. (2010). Examining the tourism distribution channel: Evolution and transformation. *International Journal of Contemporary Hospitality Management*, 22(4–5), 736–757.
- Ku, E. C., & Fan, Y. W. (2009). The decision making in selecting online travel agencies: An application of analytic hierarchy process. *Journal of Travel and Tourism Marketing*, 26(5–6), 482–493.
- Law, R., & Jogaratnam, G. (2005). A study of hotel information technology applications. *International Journal of Contemporary Hospitality Management*, 17(2), 170–180.
- Mahajan, V., Muller, E., & Srivastava, R. (1990, February). Determination of adopter categories by using innovation diffusion models. *Journal of Marketing Research*, XXVII, 37–50.
- Mansfield, E. (1961). Technical change and the rate of imitation. *Econometrica*, 29(4), 741–766.
- Meade, N., & Islam, T. (2006). Modelling and forecasting the diffusion of innovation-A 25-year review. *International Journal of Forecasting*, 22(3), 519–545.
- Morosan, C., & Jeong, M. (2008). Users' perceptions of two types of hotel reservation Web sites. *International Journal of Hospitality Management*, 27(2), 284–292.
- O'Connor, P. (2001). Room rates on the internet – Is the web really cheaper? *Journal of Services Research*, 1(1), 57–72.
- O'Connor, P., & Frew, A. J. (2002). The future of hotel electronic distribution: Expert and industry perspectives. *Cornell Hotel and Restaurant Administration Quarterly*, 43(3), 33–45. http://doi.org/10.1016/S0010-8804(02)80016-7.
- Perruchoud-Massy, M.-F., Scaglione, M., Schegg, R., & Murphy, J. (2005). Adoption of innovation by Swiss hotels: Exploring internet strategies and dynamics. In P. Keller & T. Bieger (Eds.), *Innovation in tourism: Creating customer value/AIEST, 55th congress 2005, Brainerd, USA* (Vol. 67, pp. 171–185). St. Gallen: International Association of Scientific Experts in Tourism.
- PhoCusWright. (2014). *Europe's meta game: Update on evolution of travel search*. Retrieved from <http://www.phocuswright.com/Travel-Research/Social-Search/Europe-s-Meta-Game-Update-on-Evolution-of-Travel-Search>
- Rogers, E. M. (1962). *Diffusion of innovations* (1st ed.). New York: The Free Press.
- Rossini, A. (2015). *OTA sector between increasing consolidation and the possible rise of new key players*. Retrieved from <http://blog.euromonitor.com/2015/06/ota-sector-between-increasing-consolidation-and-the-possible-rise-of-new-key-players.html>
- Runfola, A., Rosati, M., & Guercini, S. (2013). New business models in online hotel distribution: Emerging private sales versus leading IDS. *Service Business*, 7(2), 183–205. doi:10.1007/s11628-012-0150-1.
- SAS Institute Inc. (2011). *SAS/STAT® 9.22 user's guide*. Cary: SAS Institute Inc.
- Scaglione, M., & Schegg, R. (2015). The impact of attribute preferences on adoption timing of hotel distribution channels: Are OTAs winning the customer race? In I. Tussyadiah &

- A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 681–693). Cham: Springer.
- Scaglione, M., Schegg, R., Steiner, T., & Murphy, J. (2004a). The diffusion of domain names by small and medium-sized Swiss hotels. In P. Keller & T. Bieger (Eds.), *The future of small and medium sized enterprises in tourism 54th AIEST congress* (Vol. 46, pp. 259–271). St. Gallen: International Association of Scientific Experts in Tourism.
- Scaglione, M., Schegg, R., Steiner, T., & Murphy, J. (2004b). Internet adoption by Swiss hotels: The dynamics of domain name registration. In A. J. Frew (Ed.), *Proceedings of the 11th international conference on information technologies in tourism, Cairo, Egypt* (pp. 479–488). New York: Springer.
- Schaal, D. (2015). *And then the earth shook: Google enters travel booking*. Retrieved from <http://skift.com/2015/07/13/and-then-the-earth-shook-google-enters-travel-booking/>
- Schegg, R. (2014). *European hotel distribution study: The rise of online intermediaries*. Special Focus Switzerland. Retrieved from <http://etourism-monitor.ch/node/129>
- Schegg, R. (2015). *Swiss hotel distribution study: Are OTAs winning the customer race?* Retrieved from <http://etourism-monitor.ch/node/135>
- Schegg, R. & Fux, M. (2010). Die Bedeutung des Online-Vertriebs in der Schweizer Hotellerie. *Jahrbuch der Schweizer Hotellerie*, 101–104.
- Schegg, R., & Scaglione, M. (2013). Substitution effects across hotel distribution channels. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 801–812). Cham: Springer.
- Schegg, R., Stangl, B., Fux, M., & Inversini, A. (2013). Distribution channels and management in the Swiss hotel sector. In L. Cantoni & Z. Xiang (Eds.), *Information and communication technologies in tourism 2013* (pp. 554–565). Berlin: Springer.
- Schegg, R., Steiner, T., Frey, S., & Murphy, J. (2002). Benchmarks of Web site design and marketing by Swiss hotels. *Information Technology & Tourism*, 5(2), 73–89.
- Srinivasan, V., & Mason, C. H. (1986). Technical note – Nonlinear least squares estimation of new product diffusion models. *Marketing Science*, 5(2), 169–178. doi:10.1287/mksc.5.2.169.
- Thompson, G. (2005). Hotel room rates across booking channels. *Cornell Hotel and Restaurant Administration Quarterly*, 46(2), 106–107.
- Toh, R. S., Raven, P., & DeKay, F. (2011). Selling rooms: Hotels vs. third-party websites. *Cornell Hospitality Quarterly*, 52(2), 181–189.
- Van den Bulte, C., & Lilien, G. L. (1997). Bias and systematic change in the parameter estimates of macro-level diffusion models. *Marketing Science*, 16(4), 338–353. doi:10.1287/mksc.16.4.338.
- Varini, K., Scaglione, M., & Schegg, R. (2011). Distribution channel and efficiency: An analytic hierarchy process approach. In R. Law, M. Fuchs, & F. Ricci (Eds.), *Information and communication technologies in tourism 2011: Proceedings of the international conference in Innsbruck, Austria, January 26–28, 2011*. Wien/New York: Springer.
- Werthner, H., & Klein, S. (1999). *Information technology and tourism – A challenging relationship* (1st ed.). Vienna: Springer.
- Young, P., & Ord, K. (1985). The use of discounted least squares in technological forecasting. *Technological Forecasting and Social Change*, 28(3), 263–274. doi:10.1016/0040-1625(85)90048-4.

# The Secret of Fundraising on Kickstarter: Colour Congruence

Bell Lee and Andy Lee

**Abstract** The hospitality industry is predominantly comprised of small and medium-sized enterprises (SMEs) and SMEs face difficulties in financing from conventional investors. Kickstarter, a crowdfunding platform, has been popular among the SME entrepreneurs who have great ideas but insufficient capital to launch their business because it provides an online platform for fundraising from individual investors. Based on colour psychology, this study investigated the role of colour in promotional video clips of hospitality SMEs on Kickstarter. By analysing the RGB colour coding of clothing colour of focal speakers in the video clips, this study found that the success of fundraising is related to colour congruence between clothing colour and the project theme. Findings of this study make a contribution to the colour psychology research and offer managerial implications to potential SMEs in the hospitality industry.

**Keywords** Kickstarter • Crowdfunding • Colour psychology • Fundraising • SMEs

## 1 Introduction

The availability of fundraising through the Internet platform offers an innovative financing opportunity to many people who have great sources but have little money. Crowdfunding is a spin-off concept from the crowdsourcing concept (Howe, 2006). Originally, the crowdsourcing concept aims to have suggestions or recommendations from individuals to have better answers to cooperation (Howe, 2006). According to Belleflamme, Lambert, and Schwienbacher (2010), crowdfunding is fundraising from individuals through the Internet where funds can be raised via donation and/or via types of investments such as financial gain from the success of the project (Osgood, Suci, & Tannenbaum, 1964).

Among several crowdfunding platforms, Kickstarter, launched in 2001, is the most famous crowdfunding platform (Wortham, 2012). In 2014, 22,252 creative projects were created on Kickstarter and 529 million dollars were pledged from 3.3 million people from around the world (Kickstarter, 2015). With only 36.74 % of a

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success rate, project creators need to put a great effort to persuade the online investors or crowd, as opposed to traditional investors, to pledge funds to their projects over their counterparts (Kickstarter, 2015; Schmitt & Pan, 1994). Given the predominant percentage of small and medium-sized enterprises (SMEs) in the hospitality industry, Kickstarter is expected to alleviate the financing problem of the hospitality SMEs who have great ideas but have difficulties to finance via traditional sources. While successful fundraising on Kickstarter relies on effectively promoting their ideas to the potential online investors, what constitutes an effective fundraising appeal still remains a mystery. Of scant research on Mitra and Gilbert (2014) examined common linguistic components among successful fundraising appeals on Kickstarter. Investing descriptive phrases used in projects, they found that positive phrases appealed to more supporters than negative phrases. For example, projects using 'mentions your' and 'also receive two' phrases received more funds than those using 'not been able' and 'hope to get'. Interestingly, the word 'karma' has a positive impact on the success of fundraising.

In addition to the linguistic approach, another approach based on colour psychology would expand the knowledge on crowdfunding. The colour psychology approach would play an important role in crowdfunding research due to the entrepreneurial nature of crowdfunding projects. Considering crowdfunding as a market place, psychologists and marketing researchers have conducted research on how to encourage people to consume the idea and how to organize information to get people involved (Jenkins, 2009) and found that consumption or funding decision making is strongly linked with the perception of product, which is mainly derived from brand recognition (Chellappa & Pavlou, 2002; Kim et al., 2001; Miyazaki & Fernandez, 2001). However, when no such brand recognition is established as in an entrepreneurial crowdfunding project, consumption or funding decision making is significantly affected by the first impression of the product or project (Ward & Lee, 2000). Of various influential factors on the first impression, colour psychology suggests that colour plays a significant role in evoking emotions (e.g., positive or negative valence) toward products or people, therefore affects consumer purchasing behaviour (Mehrabian & Russell, 1974; Russell & Pratt, 1980). In comparison to the far-reaching power of crowdfunding, scant research has been conducted on the role of colour in crowdfunding fundraising appeal. According to Kuppuswamy and Bayus (2013), around 80 % of successful Kickstarter projects have a video to promote their projects. Therefore, the objective of this study is to investigate the relationship between colour usage in promotional videos and the success of fundraising on Kickstarter. Following literature reviews on Kickstarter, colour and emotion, and consumer decision making, data collection and analyses will be explained. Then, discussion on the result will be made and this study will be concluded with future research and limitations.

## 2 Literature Review

### 2.1 *An Overview of Kickstarter*

The initial purpose of Kickstarter was to provide an electronic platform for fundraising for artists and entrepreneurs to develop their ideas through financial supporting (Kickstarter, 2015). Since then, Kickstarter has helped a large range of projects promoted through written descriptions, multimedia, and other persuasive tools (Kickstarter, 2015). Given Kickstarter's 'all or nothing' policy, no money will be collected from backers (pledgers or supporters) or transferred to projects creators if a fundraising target is not reached within a set period of time (Kickstarter, 2015). When the fundraising target is reached, crowdfunding platforms usually take up to 10 % from the raised fund as service and processing fees. Pebble, a smart watch, is the first well-known successful example of Kickstarter, which had raised more than \$2.6 million from around 18,000 backers (Wharton, 2010). To better understand Kickstarter, some terms need to be explained. On Kickstarter, people who support a project and pledge money are called backers. A pledged project is a project that received a fund from (is backed by) at least one backer. Project creators can promote their ideas in 1 of the 13 different categories in Kickstarter including Art, Comics, Dance, Design, Fashion, Film, Video, Games, Music, Photography, Publishing, Technology, Theater, and Food. Under the food category, there are 12 groups such as Bacon, Community gardens, Cookbooks, Drinks, Events, Farmer's market, Farms, Food trucks, Restaurants, Spaces, Vegan, and Small batch. Referring to a certain kind of whiskey which is produced by small numbers of ingredients at Jim Beam company by their unique methods (Hopkins, 2014), small batch projects become popular among hospitality SMEs due to the small producing requirement. In the Small batch category, a large range of food items in small batch such as sauce and chocolate and such equipment like jars or food containers are generally promoted.

For fundraising appeal, project creators first choose a category best matching to their project ideas. Then they need to upload campaign materials. The campaign materials usually include written descriptions such as the project title and the purpose of the project, and a promotional video clip. Also, the duration of fundraising and the fundraising target that projector creators want to reach and rewards for backers if fundraising is successful need to be specified. Especially, the fundraising duration is critical for Kickstarter projects because of its 'All or nothing' policy. However, the fundraising period can be extended if creators want. Project creators can use the update section to report details of the project and to communicate with their backers. If there are rewards for backers, creators can notify backers when they will be available through the update section. While there is no particular rule for rewards, many creators reward backers to appreciate their support. Rewards can be anything from a thank you card to a book or CD that tells the history of the project to an invitation to the product launching site

(Kickstarter, 2015). Project creators generally offer tiered rewards depending on the amount that a backer pledges.

There are three points that project creators promote their projects to the crowd: Written descriptions, rewards, and a promotional video clip. Among them, the video clip is considered as the most critical medium because it carries the powerful eye catching element, colour. While a video is not a compulsory component for a project to be on Kickstarter, Kickstarter recommends a promotional video to project creators because the projects with video show a higher success rate than the projects without video (Kickstarter, 2015). The promotional video clip must be less than five gigabytes in MOV, MP4 or WMV format. On Kickstarter, the promotional video is located before written descriptions and rewards so that it would capture potential backers' attention first. According to Singh (2006), there is a tendency that people make a decision within 90 s or based on the first impression of product or people. Moreover, 62–90 % of the decision is based up on colour itself (Ketcham, 1958; Singh, 2006). Since the hospitality and tourism sector predominantly consists of small business, this study will examine small batch projects and their video clips (Mitra & Gilbert, 2014).

## ***2.2 Persuasion and Credibility of Crowdfunding Platforms***

Several studies have examined the motivation of backers to support crowdfunding projects and found that rewards from successful projects are one of the reasons (Hemer, 2011). Some researchers suggest that the major pledge motivation to a Kickstarter project is financial returns such as sharing profits when the project is commercialised (Agrawal, Catalini, & Goldfarb, 2013, 2015; Ward & Ramachandran, 2010). Others, however, suggest that backers expect no rewards. Instead, they are persuaded or moved by preparation or efforts that project creators have put on their project (Burtch, Ghose, & Wattal, 2013; Mollick, 2014; Smith, Windmeijer, & Wright, 2012). In this case, rewards are considered as a by-product of a successful project (Hemer, 2011).

According to Herzenstein, Sonenshein, and Dholakia (2011), the project creator is an important element that backers rely on when they make a support decision. Reflected in written descriptions and video, personal characteristics of the creator determine the success of a project (Pope & Sydnor, 2011; Ravina, 2012). Diligence and passion of the creator, which can be measured by the extent to which the creator puts efforts to the project, affect the success of fundraising (Mollick, 2013, 2014). Consequently, credibility of the creator plays a crucial role in backers' decision making. Backers also rely on the creator's track record on previous Kickstarter projects when they make a decision (Mollick, 2013, 2014). Kickstarter emphasises trust for a project to succeed (Kickstarter, 2015). Credibility is a key component for such online communities as Kickstarter to survive (Lee, Law, & Murphy, 2011) and they cannot have enough supports from backers if projects cannot deliver credibility (Kickstarter, 2015).

In conclusion, the contents of projects and the way of promoting them affect engagement from supporters (Mitra & Gilbert, 2014). Many purchasing behaviour studies have examined the motivation of crowdfunding platform in terms of persuasion and credibility (Shrum, Liu, Nespoli, & Lowrey, 2012). Due to the similarity of purchasing behaviour and Kickstarter backers' decision making, persuasion and credibility can be applied to a study on the success of funding on Kickstarter where the creator plays an important role in delivering credibility to supporters.

### ***2.3 Colour and Emotion***

Conveying implicated meaning, colour is considered as an integral element to allure consumers (Kauppinen-Räsänen & Luomala, 2010). Especially, different colour could deliver different messages to consumers and awareness of colour being used could increase the credibility of a product (Morton, 2001). Given its association with being intensive and eye catching, red increases blood pressure, raises pulse rate and forces people to make a decision (Morton, 2001). Often fast food restaurants use red to capture attentions of those who are hungry. On the other hand, blue is associated with integrity and confidence so it grabs consumers' attention and often prolongs their stay at the retail shop (Silver et al., 1988). For this reason, luxury products often use blue in their logos (Silver et al., 1988). Blue is typically classified as the most preferred colour (Silver et al., 1988; Wiegersma & Van der Elst, 1988). There is a general tendency that cool colours (e.g., green, blue, violet) are preferred to warm colours (e.g., red, orange, yellow). Evidently, more purchases are made in a blue retail environment than a red retail environment (Bellizzi, Crowley, & Hasty, 1983; Middlestadt, 1990).

Colour affects consumer's perception and behaviour via emotion (Aslam, 2006). Different colours derive different emotional responses, which consequently affect purchase intention on a particular product (Alpert & Alpert, 1990; Gorn, Chattopadhyay, Sengupta, & Tripathi, 2004). Based on emotion with the pleasure-arousal-dominance dimension, Mehrabian and Russell (1974), found that blue and green are the most pleasant colours and yellow is the least arousing colour. Cool colours are viewed as arousal colours and warm colours are considered as active colours. While white, black, and grey are considered value-neutral (Singh, 2006), they can also convey different information or impression to perceivers when they are used in combination with other colours (Cooper, 1994; Singh & Srivastava, 2011). White often represents purity, peace, light, and youth. In marketing, white is used for products associated with healing or treatment (Singh & Srivastava, 2011). Black delivers darkness, mystery or some negative feelings but it is often used to give contrast and comparison with other colours (Singh & Srivastava, 2011). Black triggers instant responses like red does so black is recommended to leave a strong impression or to deliver intense messages (Sallis & Buckalew, 1984). On the

contrary, white draws insignificant responses from consumers (Sallis & Buckalew, 1984). Discussion on colour and consumer decision making follows.

## ***2.4 Colour and Consumer Decision Making***

A plethora of research studies have emphasized the role of colour in marketing and advertising (Gordon, Finlay, & Watts, 1994; Kroeber-Riel, 1979; Lohse & Rosen, 2001; Mehrabian & Russell, 1974; Osgood et al., 1964; Schmitt & Pan, 1994). Colour delivers information of products and affects consumer purchase decision making (Birren, 1950; Margulies, 1970; McNeal & Ji, 2003; Wollard, 2000). According to Kotler (1973), colour is able to convey messages and evoke certain feelings which could affect customers' purchasing decision making. For example, blue calms people so that it allows consumers to take times to look at products and to consider several options before they make a purchase decision (Cimbalo, Beck, & Sendziak, 1978; Gerard, 1958; Kotler, 1973). Their prolonged stay at a shop, on the other hand, allows customers to purchase other items as well (Gerard, 1958; Kotler, 1973).

Colour can be classified by its wavelength in the visual spectrum. For example, red has a longer wavelength whereas blue has a shorter wavelength (Wiegersma & Van der Elst, 1988). Short wave colour tends to drag a quick response toward products from consumers whereas, long wave colour drags a delayed response. In previous research, a red capsule showed a stronger placebo effect than a white capsule (Jacoby, Kelley, & Dywan, 1989; Sallis & Buckalew, 1984). That is, although two capsules contained the same materials, people perceived the red capsule worked better than the white capsule. Crowley (1993) postulated that short wave colour is associated with a stronger arousal effect and physiological responses than long wave colour. The arousal effect is postulated to enforce the understanding of advertising information (Kroeber-Riel, 1979). Hemphill (1996) revealed the association between colour and emotion by examining the clothing colour of news anchors. News anchors wearing blue and green were perceived more confident than and preferred to news anchors wearing yellow or red (Hemphill, 1996; Kyle & Mahler, 1996).

The literature review has revealed a plethora of research studies on the relationship between colour and emotion and the relationship between emotion and consumer decision making behaviour. While it is logical to assume a significant relationship between colour and consumer decision making, research directly examining colour and consumer decision making is scant. Given the emerging role of crowdfunding in a hospitality SME, this study will examine colour and consumer decision making on Kickstarter.

### 3 Methodology

#### 3.1 Study Design

This study investigated the small batch Kickstarter projects that had met their fundraising target. There were 39 successful projects on the first of July, 2015. The initial plan of this study to achieve the study objective was to compare and contrast promotional video clips between successful and unsuccessful projects. However, when we looked at the video clips of unsuccessful projects, many unsuccessful projects had no or low quality video clips, which prevented any meaningful comparison. Thus, we decided to analyse videos from the 39 successful small batch projects. This study particularly analysed the clothing colour of project creators presented in the promotional video and examined the relationship between clothing colour of a focal speaker and the success of the Kickstarter project.

#### 3.2 Data Collection and Classification

Project creators were identified based on the caption on the screen (e.g., founder, co-founder, creator) and narration in the video (e.g., “I am the founder of this project”). To analyse the clothing colour, the very first scene where a project creator appeared was captured using a screen capture program. Then, Photoshop was used to extract colour information. Extracted colour information was recorded according to RGB system. RGB system is a colour spectrum made by light beams added (Popa, Popescu, Berehoiu, & Berehoiu, 2013). RGB system represents a colour in a quantifiable level of red, green, and blue ranging from 0 to 255 respectively. For example, “pure” red can be represented in (255, 0, 0), “pure” green in (0, 255, 0), and “pure” blue in (0, 0, 255). Mathematically, RGB system can represent around 16.8 million colours.

In order to make colour analysis manageable, six colours in RGB system were chosen as criterion colours. The decision of criterion colours was made based on the following procedure. First, three basic colours, red (255, 0, 0), green (0, 255, 0), and blue (0, 0, 255) were selected. Then, three additional colours were included by combining any two dominant colours: yellow (255, 255, 0) from red and green, cyan (0, 255, 255) from green and blue, and magenta (255, 0, 255) from blue and red. Then, a colour with all levels at the one end, which is black (0, 0, 0), and another colour at the other end, which is white (255, 255, 255) were added. Similarly, grey (128, 128, 128) from combining black and white was added as criterion colours. When a focal speaker wore clothes with mixed colours or patterns (e.g., a plaid shirt, a shirt with polka dots), its colour was classified as mixed. As a result, ten criterion colours (i.e., red, yellow, green, cyan, blue, magenta, black, grey, white, and mixed) were used for further analyses. To classify the extracted colour into a criterion colour, Euclidean distance between the extracted colour and

each criterion colour was calculated. The extracted colour was classified into a criterion colour with the shortest distance from it. The time that each clothing colour (or the project creator wearing the clothes) appeared was recorded in seconds. When more than one project creator appeared in a scene, information for each project creator was recorded respectively. Also, the total video length was recorded.

While the sample was from successful small batch projects, each project was classified into six groups based on the object to commercialise or the objective to achieve. The six groups included sauce, desserts, food, beverage (e.g., tea and coffee), alcoholic beverage, and others. Others group included kitchen equipment (e.g., a jar and an oven), pet food, and fundraising for relocation. Also, the fundraising target, the amount pledged, and the fundraising period were recorded.

There were two projects where no project creators appeared in their promotional video clips. These two projects were excluded from further analyses, which resulted in reducing the sample size to 37.

### **3.3 Descriptive Analysis**

The highest fundraising project received \$184,133 while its fundraising target was \$35,000. The lowest fundraising project received \$18,412 whereas its fundraising target was \$15,000. Based on the percentage of the amount pledged to the fundraising target (hereafter, success rate), 28 projects were in the range between 100 % and 150 %. There were two projects reached more than 500 % of the fundraising target.

The longest video clip ran 2217 s (37 min) and the shortest video ran 78 s. Of the 37 projects, 20 projects had one project creator, 14 had two creators, and the rest had three creators. The average period of fundraising was 33 days ranging from 20 to 61 days. On average, it took 29 days to reach the fundraising target while two projects reached its target within 2 and 8 days respectively.

Of the 37 projects, seven projects were grouped into sauce, six into desserts, six into food, six into beverage, eight into alcoholic beverage, and four into others.

Not all criterion colours appeared in every video clip. Yellow did not appear in the alcoholic beverage and sauce projects. Magenta did not appear in the projects in the beverage, sauce, food, dessert, and other categories. Grey did not appear in the food projects.

## **4 Results and Discussion**

In order to achieve the study objective, the correlations among clothing colour, the amount pledged, and the success rate were analysed. Due to the small sample size, a nonparametric correlation, Spearman's rho was used.

For the beverage projects, red and white were significantly correlated with the success rate ( $r_s$  for red = 0.883,  $p = 0.02$ ;  $r_s$  for white = -0.956,  $p = 0.003$ ). The significant correlation between red and the success rate in the beverage projects implies that colour matching between the project item and creator's clothing increases the project success rate. Items in the beverage projects are mainly coffee and brown colour (165, 42, 42) was extracted from coffee bean and coffee. Based on Euclidean distance, the extracted brown was grouped in red.

For the alcoholic beverage projects, grey was negatively correlated with the amount pledged ( $r_s = -0.791$ ,  $p = 0.02$ ). This result can be explained by colour psychology. Since grey implies old-age, dullness, boredom, and decay in colour psychology, it could have negatively affected fundraising (Singh & Srivastava, 2011). Moreover, beer was a predominant product in this category. Due to the sadness characteristic of grey, people might perceive that grey does not match to beer.

For the sauce projects, mixed colour was negatively correlated with the success rate ( $r_s = -0.757$ ,  $p = 0.04$ ). Different types of sauces were promoted in this group. That is, some were savoury sauces such as Sriracha sauce or vegetable sauce so they can be used for cooking whereas others were dessert sauces such as jam made of strawberry and grapes. Unlike the beverage and alcoholic projects, no common colour could be identified among sauces projects. However, backers might hold a fixed image (or colour) of a certain sauce certain colour associated with a sauce. Thus, if the project creator worn mixed colour clothes, mixed colour might not match to the colour that backers hold and consequently make them more confused and difficult to make a funding decision.

For the projects in others group, white was significantly correlated with the success rate ( $r_s = 1$ ,  $p < 0.001$ ). This category had four projects including a glass jar, a grey oven, relation (i.e., moving out), and brown coloured pet food. Since it is hard to identify a common colour among these items, backers might get confused. Given white being neutral colour (Childers & Houston, 1984), it is assumed that backers subliminally consider white as a representative colour.

Clothing colours in food and desserts projects were related to neither the amount pledged nor the success rate. No significant correlations among clothing colour, the amount pledged, and the success rate were found when all projects were analysed together without group categorisation.

Existing research suggests that blue is commonly recommended for the interviewee because of its association with confidence and integrity to people (Silver et al., 1988). Also, blue is the most preferable colour in general acceptance (Sallis & Buckalew, 1984; Silver et al., 1988; Wiegersma & Van der Elst, 1988). However, we did not find any correlation between blue and fundraising. Yellow is also considered to trigger consumption but no significant correlation was not found in Kickstarter projects (Singh & Srivastava, 2011). When black is used with other colours, black makes other colours stand out (Madden, Hewett, & Roth, 2000; Priluck Grossman & Wisenblit, 1999). However, no correlation among black and other colours was found.



## 5 Conclusion and Implications

This study examined 37 successful Kickstarter projects in the small batch category to understand colour congruence between projects and spokesperson's clothes. Taking an exploratory approach, this study found that colour is likely to affect backers' support decision making when the colour of the project item and the clothing colour of a focal speaker match. Wearing single colour, as opposed to mixed colour, clothes would generate a positive outcome while white and grey clothes need to be avoided.

This study sheds a light on crowdfunding research by examining the relationship between colour and crowdfunding success. Findings of this study suggest that colour itself is an important element in a promotional video but colour congruence with the project item should be considered for Kickstarter project success. Also, this study contributes to the body of knowledge by identifying that colour congruence would be a more appropriate approach to persuasion than a light wavelength (e.g., cool colour and warm colour) approach. Findings of this study are somewhat contradictory to existing literature on the association of warm colours with a positive valence and credibility (Cimbalo et al., 1978; Gerard, 1958), but resonate with Kolter's (1973) study, which postulates emotional responses can be formed from proper colour usage.

In terms of practical implications, this study can offer a guideline to hospitality business operators who want to an online video advertisement on crowdfunding platforms like Kickstarter. Prior to video shooting, the project creator first needs to understand clearly the representative colour of their item. Then, the projector creator can wear clothes congruent with the representative colour. Plaid shirts, with busy colours, and white or grey clothes must be avoided unless they present the item.

## 6 Limitations and Future Research

Due to the exploratory nature of the study, the sample size was small and findings are difficult to be generalizable. Also, we selected only six criterion colours, which might suppress variances of different colours significantly. Moreover, colours in the video clips could look different on different monitors, especially on the poorly calibrated monitors. While crowdfunding platforms attract hospitality SMEs, the findings of the current study are not strongly tied with the hospitality and tourism industry. It is because crowdfunding is not originated from the hospitality realm and still in the early stage of adoption.

Future research can be conducted on colour congruence with a larger sample in different categories. The nature of the category chosen for this study would eliminate a certain colour to be examined. For example, while blue is the most preferable colour in general apperception, blue food items are less likely to be

found in nature. Thus, examining colour congruence in different categories would offer insight into a role of colour in persuasion. Inclusion of different categories would consequently increase the sample size. A larger sample will also allow parametric statistical analyses and findings to be more generalizable.

## References

- Agrawal, A. K., Catalini, C., & Goldfarb, A. (2013). *Some simple economics of crowdfunding* (No. w19133). Washington, DC: National Bureau of Economic Research.
- Agrawal, A., Catalini, C., & Goldfarb, A. (2015). Crowdfunding: Geography, social networks, and the timing of investment decisions. *Journal of Economics and Management Strategy*, 24(2), 253–274.
- Alpert, J., & Alpert, M. (1990). Music influences on mood and purchase intentions. *Psychology and Marketing*, 7(2), 109–133.
- Aslam, M. M. (2006). Are you selling the right colour? A cross cultural review of colour as a marketing cue. *Journal of Marketing Communications*, 12(1), 15–30.
- Belleflamme, P., Lambert, T., & Schwienbacher, A. (2010, June). *Crowdfunding: An industrial organization perspective*. Paper presented at the digital business models: understanding strategies, Paris, France.
- Bellizzi, J. A., Crowley, A. E., & Hasty, R. W. (1983). The effects of color in store design. *Journal of Retailing*, 59(1), 21–45.
- Birren, F. (1950). *Color psychology and color therapy: A factual study of the influence of color on human life*. Whitefish: Kessinger.
- Burch, G., Ghose, A., & Wattal, S. (2013). An empirical examination of the antecedents and consequences of contribution patterns in crowd-funded markets. *Information Systems Research*, 24(3), 499–519.
- Chellappa, R. K., & Pavlou, P. A. (2002). Perceived information security, financial liability and consumer trust in electronic commerce transactions. *Logistics Information Management*, 15(5/6), 358–368.
- Childers, T. L., & Houston, M. J. (1984). Conditions for a picture-superiority effect on consumer memory. *Journal of Consumer Research*, 11(2), 643–654.
- Cimbalo, R. S., Beck, K. L., & Sendziak, D. S. (1978). Emotionally toned pictures and color selection for children and college students. *The Journal of Genetic Psychology*, 133(2), 303–304.
- Cooper, M. (1994). The color of money may actually be fuchsia. *Direct Marketing*, 34, 66–70.
- Crowley, A. E. (1993). The two-dimensional impact of color on shopping. *Marketing Letters*, 4(1), 59–69.
- Gerard, R. M. (1958). *Differential effects of colored lights on psychophysiological functions*. Doctoral dissertation, University of California.
- Gordon, A., Finlay, K., & Watts, T. (1994). The psychological effects of colour in consumer product packaging. *Canadian Journal of Marketing Research*, 13(3), 3–11.
- Gorn, G. J., Chattopadhyay, A., Sengupta, J., & Tripathi, S. (2004). Waiting for the web: How screen color affects time perception. *Journal of Marketing Research*, 41(2), 215–225.
- Hemer, J. (2011). *A snapshot on crowdfunding* (No. R2/2011). Retrieved from Working papers firms and region.
- Hemphill, M. (1996). A note on adults' color-emotion associations. *The Journal of Genetic Psychology*, 157(3), 275–280.
- Herzenstein, M., Sonenshein, S., & Dholakia, U. M. (2011). Tell me a good story and I may lend you money: The role of narratives in peer-to-peer lending decisions. *Journal of Marketing Research*, 48(SPL), 138–149.

- Hopkins, A. (2014, August 27). *Legal action against 'small batch' whiskeys urged*. Retrieved from <http://www.thespiritsbusiness.com/2014/08/legal-action-against-small-batch-whiskeys-urged/>
- Howe, J. (2006). The rise of crowdsourcing. *Wired Magazine*, 14, 1–4.
- Jacoby, L. L., Kelley, C. M., & Dywan, J. (1989). Memory attributions. In H. L. Roediger & F. I. M. Craik (Eds.), *Varieties of memory and consciousness: Essays in honour of Endel Tulving* (pp. 391–422). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Jenkins, H. (2009). A 'business opportunity' model of corporate social responsibility for small and medium sized enterprises. *Business Ethics: A European Review*, 18(1), 21–36.
- Kauppinen-Räsänen, H., & Luomala, H. T. (2010). Exploring consumers' product-specific colour meanings. *Qualitative Market Research: An International Journal*, 13(3), 287–308.
- Ketcham, H. (1958). *Color planning: For business and industry*. New York: Harper.
- Kickstarter. (2015). *About us*. Retrieved from <http://www.Kickstarter.com>
- Kim, H., Shin, D. C., Kim, S. H., Ko, C. H., Yu, H. S., Chae, Y. S., et al. (2001). Novel blue emitting material with high color purity. *Advanced Materials*, 13(22), 16–90.
- Kotler, P. (1973). Atmospherics as a marketing tool. *Journal of Retailing*, 49(4), 48–64.
- Kroeber-Riel, W. (1979). Activation research: Psychobiological approaches in consumer research. *Journal of Consumer Research*, 5(4), 240–250.
- Kuppuswamy, V., & Bayus, B. L. (2013). *Crowdfunding creative ideas: The dynamics of projects backers in Kickstarter* (UNC Kenan-Flagler research paper 2013–15). Retrieved from <http://dx.doi.org/10.2139/ssrn.2234765>
- Kyle, D. J., & Mahler, H. I. (1996). The effects of hair color and cosmetic use on perceptions of a female's ability. *Psychology of Women Quarterly*, 20(3), 447–455.
- Lee, H. A., Law, R., & Murphy, J. (2011). Helpful reviewers in TripAdvisor, an online travel community. *Journal of Travel & Tourism Marketing*, 28(7), 675–688.
- Lohse, G. L., & Rosen, D. L. (2001). Signaling quality and credibility in yellow pages advertising: The influence of color and graphics on choice. *Journal of Advertising*, 30(2), 73–83.
- Madden, T. J., Hewett, K., & Roth, M. S. (2000). Managing images in different cultures: A cross-national study of color meanings and preferences. *Journal of International Marketing*, 8(4), 90–107.
- Margulies, W. P. (1970). *Packaging power*. North Central Washington: World Publishing.
- McNeal, J. U., & Ji, M. F. (2003). Children's visual memory of packaging. *Journal of Consumer Marketing*, 20(5), 400–427.
- Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. Cambridge, MA: The MIT Press.
- Middlestadt, S. E. (1990). The effect of background and ambient color on product attitudes and beliefs. *Advances in Consumer Research*, 17(1), 244–249.
- Mitra, T., & Gilbert, E. (2014, February). The language that gets people to give: Phrases that predict success on kickstarter. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing* (pp. 49–61). ACM.
- Miyazaki, A. D., & Fernandez, A. (2001). Consumer perceptions of privacy and security risks for online shopping. *Journal of Consumer Affairs*, 35(1), 27–44.
- Mollick, E. (2013, March). *Swept away by the crowd? Crowdfunding, venture capital, and the selection of entrepreneurs*. Retrieved from <http://dx.doi.org/10.2139/ssrn.2239204>
- Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing*, 29(1), 1–16.
- Morton, J. (2001). *Colour voodoo for E-commerce*. Honolulu, HI: COLOURCOM.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1964). *The measurement of meaning*. Champaign, IL: University of Illinois Press.
- Popa, C. N., Popescu, S., Berehoiu, R. M. T., & Berehoiu, S.-M. T. (2013). Considerations regarding use and role of colour in marketing. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, 13(1), 78–91.
- Pope, D. G., & Sydnor, J. R. (2011). What's in a picture? Evidence of discrimination from prosper. *Journal of Human Resources*, 46(1), 53–92.

- Priluck Grossman, R., & Wisenblit, J. Z. (1999). What we know about consumers' color choices. *Journal of Marketing Practice: Applied Marketing Science*, 5(3), 78–88.
- Ravina, E. (2012). *Love & loans: The effect of beauty and personal characteristics in credit markets*. Retrieved from <http://dx.doi.org/10.2139/ssrn.1107307>
- Russell, J. A., & Pratt, G. (1980). A description of the affective quality attributed to environments. *Journal of Personality and Social Psychology*, 38(2), 311.
- Sallis, R. E., & Buckalew, L. W. (1984). Relation of capsule color and perceived potency. *Perceptual and Motor Skills*, 58(3), 897–898.
- Schmitt, B. H., & Pan, Y. (1994). Managing corporate and brand identities in the Asia-Pacific region. *California Management Review*, 36(4), 32–39.
- Shrum, L. J., Liu, M., Nespoli, M., & Lowrey, T. M. (2012). Persuasion in the marketplace: How theories of persuasion apply to marketing and advertising. In J. P. Dillard & L. Shen (Eds.), *The persuasion handbook* (pp. 314–330). Thousand Oaks, CA: Sage.
- Silver, N. C., Mc Culley, W., Chambliss, L., Charles, C., Smith, A., & Winfield, E. (1988). Sex and racial differences in color and number preferences. *Perceptual and Motor Skills*, 66(1), 314–320.
- Singh, S. (2006). Impact of color on marketing. *Management Decision*, 44(6), 783–789.
- Singh, N., & Srivastava, S. (2011). Impact of colors on the psychology of marketing. A comprehensive over view. *Management and Labour Studies*, 36(2), 199–209.
- Smith, S., Windmeijer, F., & Wright, E. (2012). *The effect of social information on charitable donations: Evidence from the (running) field1*. University of Bristol Working Paper. <http://www.bristol.ac.uk/cmpo/events/2012/charitablegiving/smith.pdf>. Accessed on May 1, 2014.
- Ward, M. R., & Lee, M. J. (2000). Internet shopping, consumer search and product branding. *Journal of Product and Brand Management*, 9(1), 6–20.
- Ward, C., & Ramachandran, V. (2010, December). *Crowdfunding the next hit: Microfunding online experience goods*. Paper presented at the workshop on computational social science and the wisdom of crowds at NIPS2010, Vancouver
- Wharton. (2010). *Can you spare a quarter? Crowdfunding sites turn fans into patrons of the arts*. Retrieved December 13, 2013, from <http://knowledge.wharton.upenn.edu/article.cfm?articleid=2647>
- Wiegiersma, S., & Van der Elst, G. (1988). “Blue Phenomenon”: Spontaneity or preference? *Perceptual and Motor Skills*, 66(1), 308–310.
- Wollard, K. (2000, November). *Orange you glad you aren't blue?* Retrieved from <http://www.newsday.com/>
- Wortham, J. (2012, April 29). Start-ups look to the crowd. *The New York Times*. Retrieved from [http://www.nytimes.com/2012/04/30/technology/kickstarter-sets-off-financing-rush-for-a-watch-not-yet-made.html?\\_r=0](http://www.nytimes.com/2012/04/30/technology/kickstarter-sets-off-financing-rush-for-a-watch-not-yet-made.html?_r=0)

# Concept of Digital Capability in Businesses: Demonstration by a Case Study on Finnish Online Tools

Kirsi Meriläinen and Joni Kukkamäki

**Abstract** This paper addresses the research question of what the capability required by a tourism company for transforming the business towards digital era is. In order to achieve the goal, a selected literature review of digital enterprise management and eTourism management is conducted, and the multiple case study on two Finnish online tools for enriching the literature and clarifying the capabilities more concretely was employed. Through the seeking and combining of insights from the above-mentioned literature and cases, the paper provides a concept of digital capability including various dimensions for further tourism research. Initial findings indicate that the digital capabilities fall into two major categories: meta-digital capabilities and specific digital capabilities. Both categories cover several subdimensions. Particularly, the individual-level specific digital capabilities and collaborative digital capabilities across company boundaries warrant further attention.

**Keywords** Digital capability • Tourism • Online assessment tool • Case study

## 1 Introduction

The ongoing digitalisation process impacts on all companies, regardless of their size and scope. Consequently, it provides unprecedented opportunities for businesses. Recent findings indicate that digitalised companies are more innovative and profitable than their non-digitalised industry peers (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2013). While the companies face new challenges that they are continuously struggling to overcome, for competitive companies there is only one option: to seize the opportunities provided by digitalisation. From a managerial viewpoint, this means, first and foremost, the building of new capabilities (Ilmarinen & Koskela, 2015). However, the companies are unclear as to what these capabilities are. An understanding of key capabilities is, however, of key importance for

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companies, because through influencing the capabilities, their core business can be transformed and their competitiveness improved. The discussion on capabilities related to digitalisation have also been acknowledged in tourism literature. This is hardly surprising given that technology is regarded as the greatest agent for change in tourism marketing (Gretzel, Fesenmaier, Formica, & O'Leary, 2006). Consequently, various concepts for describing the capabilities related to ICT have emerged (see e.g., D'Ambra & Mistilis, 2010; Mistillis, Buhalis, & Gretzel, 2014; Reino, Frew, & Mitsche, 2014; Yuan, Gretzel, & Fesenmaier, 2006). Furthermore, in Yuan's et al. (2006) tourism research, the concept of organisational capability related to ICT covers three subdimensions: organisational properties, leader capabilities and information technology.

All the above-mentioned studies have offered insightful knowledge on capabilities in the tourism business. However, there are two major limitations. Firstly, the studies use the terminology of capability in a faltering way, by applying various terms with vague meaning in different tourism contexts and without a clear indication of the current debate on digitalisation. Secondly, by adopting the structural approach to capabilities, the literature implicitly assumes that capability and ICT are two separate dimensions, in emphasising the use of ICT, and capabilities as enabling factors. While useful, the research lacks a rigorous concept for studying capability in today's digitalised world, where the boundary between traditional and digital business is blurring.

The purpose of the study is to describe the term 'digital capability' and to identify the key dimensions embraced by the concept, in fostering businesses in a digital era. It provides clarity on the content of digital capability in terms of the process that shows the dynamic feature of the concept. Acknowledging that the capabilities emerge both at the organisational and individual level, the latter level is also included referring not only to leaders, as in the Yuan's et al. (2006) research, but also to employees. Following on from the starting point, three research questions are asked in order to achieve our target. First, how can the digital capability in tourism business be defined? Second, which elements do the digital capabilities in businesses cover? Third, what are the individual-level capabilities? In order to achieve the target, a selected literature review was conducted. The theoretical frame for the study is derived from the literature on capability in eTourism (Reino et al., 2014; Yuan et al., 2006; Yuan, Gretzel, & Fesenmaier, 2003) combined with the debate on digital capabilities ingrained in the discussion on maturity models in digital enterprise management (Uhl and Gollenia, 2014) and digital marketing management (Chaffey, 2010) literatures. By focusing on digital enterprise management and marketing literature, a novel concept and approach to the term 'capability' for tourism can be offered. Acknowledging that there is a vibrant ongoing academic dialogue on the concept of organisational capability in the strategic management literature, only the definition of capability is included—other debate is beyond the scope of this study.

Surprisingly, however, while the topic has gained increasing attention of late, the discussion in the literature is lagging far behind the managerial discussion. Therefore, the literature review was complemented with a case study on Finnish online tools designed for assessing the capabilities, which also enabled us to concretise the

concept and to identify the gaps between the literature and the practical tools. The data was analysed by employing content analysis. By seeking and combining of insights from the above-mentioned literature and case study, the paper provides a description of digital capability in tourism and categories of digital capabilities for strengthening the related study in tourism. Hence, the outcome of the study is the concept of digital capability through which the study contributes to literature on eTourism management. Through the concept, the level of understanding of the digital capabilities in businesses can be increased. The study also has practical relevance. The concept can be used for advancing the development of a tool for assessing digital capabilities in tourism SMEs.

The study is structured as follows. First, the nature of digital capability is explored in light of the literature. Second, the research methodology is clarified. Third, the research results are explained. Finally, a discussion on the results and conclusions, including the contribution of the paper and avenues for further research, are discussed, as well as managerial implications.

## 2 Nature of Digital Capabilities in Business

The studies adopting various concepts related to capability and ICT in tourism have focused on examining different phenomena. Recently, an eTourism capability study has focused on measuring the level of ICT penetration and on assessing the level of contribution that ICT makes to the performance of an organisation or a destination (Reino et al., 2014). The studies on an organisation's capabilities have examined their role in determining the readiness of tourism businesses to embrace ICT (Yuan et al., 2003), and the relationship between organisational capabilities and IT implementation effects (Yuan et al., 2006). Studies on assessing the level of the contribution of ICT to the organisational performance have also emerged (for a review see Reino et al., 2014). Furthermore, SMEs' online capability in terms of using technology has been addressed as an important issue in future eDestination marketing for enhancing the digital customer journey (Mistillis et al., 2014). The above-mentioned tourism studies have used various *concepts* in examining the capabilities related to ICT, such as eTourism capability, ICT capability (for further discussion see Reino et al., 2014), online capability (Mistillis et al., 2014) and e-capability (D'Ambra et al. 2010). The concept of organisational capability has also been used (Yuan et al., 2003, 2006). From this study perspective, the most notable for this study purposes are eTourism capability, ICT capability and organisational capability.

Reino et al. (2014, p. 127), in adopting the term eTourism capability, have emphasised "...the contribution that the ICT uptake of a tourism organization, a tourism industry or a tourism destination... makes to its own performance." ICT capability, in turn, has been considered as the organisational ability to adopt and/or manage technology (Yuan et al., 2003; cf. Reino et al., 2014). Organisational capability represents "organization-specific abilities to adapt, to integrate, and to

re-configure internal and external organizational skills, resources, and functional competences” (Yuan et al., 2006, p. 328), which clearly builds on the original definition provided by Teece, Pisano, and Shuen (1997). Likewise, the emerging discussion on digital capabilities in digital management literature has portrayed the concept. Digital capabilities, in this debate, refer to the key skills and abilities a company requires to transform itself into a suitable and successful business by considering digital technology as the enabling component (Uhl, Born, Koschmider, & Janasz, 2014a, p. 21). In contrast to the definition provided by the tourism literature, in which organisational capability has been regarded as an enabling element, this approach underlines the role of technology as an enabling factor. Building on this, digital capability in tourism has been defined in this research as an organisation’s skills and abilities required to transform itself into a successful tourism business by using digital technology as the enabling component.

The concept of digital capability embraces *various dimensions* in describing the richness of the phenomenon. In Yuan’s et al. (2006) tourism research, the traditional view of organisational capability related to ICT includes three subdimensions: (1) organisational properties (the context and characteristics of an organisation), (2) leader capabilities (the leader’s personal characteristics and competency), and (3) information technology (conceptualisations of affordances and the perceptions of the value of IT). This conceptualization emphasizes structural features of organizational capability. The recent study on digital capabilities, in turn, identifies the capabilities in the light of organisational processes rather than structural features. In order to strengthen the traditional tourism view, the study follows this line of thinking and firstly looks at the maturity models as a context for capability dimensions, and then structures the content of the concept of digital capability.

As mentioned, the debate on digital capabilities is deeply ingrained in the discussion on maturity models, which are established methods for assessing the development of the digital capabilities of an organisation. Uhl and Gollenia (2014) define six core capabilities that the company requires to become a digital enterprise including the dimensions of customer centricity, effective knowledge workers, operational excellence, innovation capability, IT excellence and transformation capability. Whereas the first set is termed as goals, the second set is called enablers showing the capabilities required to perform the above-mentioned key business processes. Very much in line with this is the MIT maturity model, which identifies two major areas (Bonnet et al., 2012). The first area covers the firm’s value proposition, which is the ‘what’ or ‘substance’ dimension referring to providing customer experience, performing operational processes and building business models (Bonnet et al., 2012). The second area embraces the way in which managers drive change throughout the organisation: this is the ‘how’ or ‘style’ dimension encompassing the capabilities of defining and communicating a vision, establishing governance and measurement mechanisms, and building a digital-ready culture (ibid.). It is notable that unlike the original model, which avoids using the term ‘digital capability’ in referring to the dimensions, this study regards them as specific capabilities. The idea is supported by the thinking of Uhl and Gollenia (2014) regarding ‘enablers’ and ‘goals’ as capabilities, and Chaffey’s (2010) model regarding key marketing activities as capabilities.



Chaffey (2010) has presented a more specific capability maturity model, developed for assessing six different capabilities in terms of digital marketing activities. The six different marketing capabilities in this model are digital channel strategy, online customer acquisition, online customer conversion and customer experience, customer development and growth, cross-channel integration and brand development, and digital channel governance, including change management. In addition to the above-mentioned maturity models specifying digital capabilities, Bonnet et al. (2012) have identified a set of digital capabilities that cut across specific processes and serve as a fundamental building block for the development of those activities (Bonnet et al., 2012). These cutting edge capabilities cover unified data and processes, solution delivery, analytic capabilities and business and IT integration.

Looking at the ongoing discussion on digital capabilities in businesses, similarities and differences between the classifications can be found. For example, the MIT model, which includes ‘substance’ and the ‘style’ dimensions, is similar to the model developed by Uhl and his colleagues, embracing the dichotomy of ‘goal’ and ‘enabler’ dimensions. Whereas these models focus on digital business capabilities, Chaffey’s (2010) model particularly emphasises digital marketing capabilities.

While distinctive views are useful, a broader picture of the digital capabilities is needed in order to delve deeper into the true nature of digital capabilities. By integrating the preceding views into one categorisation, the following grouping of key digital capabilities and their related subcategories are presented in Table 1.

Firstly, there are two major classes of digital capability identifiable from the literature: (1) specific digital capabilities, which show the primary capabilities required for competitive business performance, and (2) meta-digital capabilities, which are generic in their nature and hence, cross-specific processes.

The specific digital capabilities can be further divided into two classes: (1) core digital capabilities showing the key business activities, which can be made more effective by using digital means, and (2) enabling digital capabilities, referring mainly to the management of the above processes.

**Table 1** Dimensions of digital capabilities [applied from Bonnet et al. (2012), Uhl and Gollenia (2014), and Chaffey (2010)]

Meta-digital capabilities		Unifying data and processes
		Delivering solutions
		Building analytic capabilities
		Integrating business and IT
Specific digital capabilities	Core digital capabilities	Implementing customer centricity
		Performing operational processes
		Building business models
	Enabling digital capabilities	Transformation capability
		Use of new technology
		Innovation capability

Following Bonnet et al. (2012), the core digital capabilities cover a firm's value proposition. This study uses the term *implementing customer centricity* to describe the capability of focusing on the most valuable customers (see Uhl and Gollenia, 2014) and providing customer experiences by using modern technologies (Bonnet et al., 2012). A goal of the capability is to achieve high-level skills in understanding customers and to have a close relationship with them (Uhl and Gollenia, 2014). Understanding customers enables companies to move towards analytics-based segmentation and feed profitable top-line growth through digitally-enhanced selling and predictive marketing (Bonnet et al., 2012). Relationships are established and strengthened through multiple customer touch points, including customer services and self-service (Bonnet et al., 2012) acknowledging digital channels issues such as online customer acquisition, online customer conversion, and cross-channel integration (Chaffey, 2010). The capability of *performing operational processes* refers to ensuring process execution in the most effective and efficient way (Uhl and Gollenia, 2014). It covers process digitalisation (Bonnet et al., 2012) and managing business processes for outstanding performance (Uhl and Gollenia, 2014). Worker enablement, such as enabling working anywhere, anytime, community knowledge-sharing and broader and faster communication (Bonnet et al., 2012), as well as the ability to provide highly motivated and collaborative working environments by utilising digital technology (Uhl and Gollenia, 2014), are of key importance for companies, in order to enhance the satisfaction of their employees and generate more effective knowledge workers (Uhl and Gollenia, 2014).

The third core capability ingrained in the specific digital capabilities is *building business models* more effectively through digital means (Bonnet et al., 2012). This refers to digitally-modified businesses in terms of product/service augmentation, transitioning physical to digital, and digital wrappers. The ability to create new digital businesses such as developing digital products and reshaping organisation boundaries also deserve attention. Digital globalisation is the ability to share digital services and promote enterprise integration when needed (ibid.). Enabling digital capabilities covers transformation capability, the use of new technology, and innovation capability. *Transformation capability* refers to how managers drive change throughout an organisation (Bonnet et al., 2012). It is about the management of complex changes for future success (Uhl and Gollenia, 2014). Transformation capability includes the ability to define and communicate a vision, to build a digital-ready culture, and to establish a governance and measurement mechanism (Bonnet et al., 2012). For managing digital channels and their change within an organisation, the ability to define a digital channel strategy and perform digital channel governance is required (Chaffey, 2010). The *use of new technology* is IT excellence, and the capability of managing innovation-related business processes is *innovation capability*. These are important for enabling the execution of core capabilities.

Finally, in line with Bonnet and colleagues' (2012) conceptualisation, the meta-digital capabilities in this study include cutting edge capabilities, which cover unified data and processes referring to a digital platform of integrated data and processes; solution delivery, encompassing the recognition of emerging digital

technologies and practices, in addition to tightly defined requirements; and mature technologies, analytical capabilities and business and IT integration. Reflecting the digital capability dimensions against the elements of organisational capability in tourism studies, a few strengthening features are identifiable: (1) a shift from the structural feature to the process feature characterisation of capability, (2) a more comprehensive picture of capabilities involving key business processes, including those beyond IT capacity, and (3) the acknowledgement of knowledge workers instead of leader competency as an individual-level manifestation. While the literature-based description of digital capability has already broadened the conceptualisation adopted in the tourism literature, the content of the concept digital capability depends and is concretised through the empirical part of the study in the manner described in the following section.

### 3 Research Methodology

The research adopts a qualitative case research strategy, which can be viewed as a comprehensive research strategy, instead of a mere research method covering only the data-gathering instruments (see e.g. Yin, 2003). The capacity of the methodology lies especially in the ways of collecting the cases (one or a small number of instances), in the research setting (without the manipulation of instances), and in the specific approaches to data analysis, referring to the way of drawing conclusions (qualitative data analysis) (see e.g. Koskinen, Alasuutari, & Peltonen, 2005). Consequently, in this paper, case study research refers to the empirical inquiry in which a small number of cases in their real-life context are selected, and scores obtained from these cases are analysed in a qualitative manner (Dul & Hak, 2008).

The phenomenon fits the criteria for case studies proposed by Yin (2003), who points out that the case study strategy is most appropriate for investigating the phenomenon in situations where little is known about the phenomenon and the current theories seem inadequate, as is the case in this research. Case studies are particularly suitable when a theory is being developed rather than tested (Dubois & Gadde, 2002; George & Bennett, 2005). This study was conducted by using a multiple case design. A multiple case study refers to the internal examination of more than one instance of an object of study (Dul & Hak, 2008; George & Bennett, 2005).

The case in this study refers to an online tool for assessing digital capabilities. An online tool is a fruitful way of researching the phenomenon, because it is relatively easy to find potential cases online, it captures the key characteristics of the digital capabilities, and it possesses relevance in reality. The case selection was guided by the notion of purposeful sampling, that is sampling on the basis of features which the study was interested in (Silverman, 2003). While the scale of the study is limited, it was conducted by using abductive reasoning (Nonaka & Takeuchi, 1995), also known as systematic combining (Dubois & Gadde, 2002),

which refers to the process of continuous movement between an empirical world and a model world (Dubois & Gadde, 2002). A review of Finnish websites concerning online tools for assessing digital capabilities identified a few available tools. Two of them were selected as cases for further analysis, because they provided further information for enriching the literature-based characterisation and hence showed relevance for business digital capabilities in particular. Therefore, for example, the tools for assessing the digital capabilities of schools and teachers were rejected.

The two selected tools were Digi Meter (<http://digitaalinenpolku.fi/tuoteperhe/digimittari/> [18 August 2015]) and Tiviittori (<http://www.tieke.fi/display/Tiviittori/Tiviittori> [18 August 2015]). Digi Meter is an online tool, offered to companies free of charge by the Finnish Chambers of Commerce. The tool is targeted at companies and their management for self-assessment, focusing on the management, competence and activities from the digitalisation viewpoint. Hence, it assesses the use of opportunities offered by the digitalisation of a company. The tool includes 16 statements, which are assessed using a 4-point scale. A key idea behind the Tiviittori tool is to assess three distinctive but closely-related knowledge work skills, namely the information society and media skills, technical-practical skills, and knowledge work skills. This is the online tool offered for companies by the Information Society Development Centre. It is notable that whereas the former tool focuses on company-level digital capabilities, the latter tool focuses on assessing individual-level capabilities in general. Nevertheless, the tool was selected despite its general nature, because the analysis is assumed to offer useful information on individual capabilities, which might be connected to business capabilities. As the literature showed, one key capability is contributing to the effective knowledge worker by utilising digital technology in building worker-friendly digital environments. In addition, the initial analysis of the Digi Meter tool indicated that the knowledge regarding individual-level capability in that tool is scarce.

The data was collected by using the method of on-site observation. In this way, the key characteristics of the digital capabilities were identified. The findings were achieved by following the logic of theoretically-driven concept analysis (see e.g. Tuomi & Sarajarvi, 2003). A key idea is that the theory provides the inspiration for data collection (i.e. the observations were based on theoretical discussion), data grouping (i.e. the dimensions arising from the data were clustered, following the theoretical concepts), data reduction (i.e. to see the relevant findings), and to help draw conclusions by seeking similarities and dissimilarities related to the dimensions across observation data and theoretical discussion.

## 4 Research Results

Following the abductive research logic, the results finally emerge from the discussion between the literature and the empirical world. Before describing the final research results, the findings derived from the website observation are summarised.

The results of the content analysis concerning the Digi Meter online tool show that the dimensions of digital capabilities emerging from the data can be divided into four main categories according to general expression, as follows: (1) developing digital competence, (2) the usage of digitalisation, (3) an ability to manage the advancement of digitalisation, and (4) innovation capability. The categories and the related specific expressions are presented in Table 2.

By analysing the results of the content analysis through literature-based categorisation, a few important notions can be identified. First, three of the four categories (utilising digitalisation, managing the advancement of digitalisation, innovation capability) fit with the literature-based categorisation, thus gaining support from real-life situations. Interestingly, the category of utilising digitalisation spans the company level by emphasising the use of digitalisation across organisational boundaries, which is beyond the scope of the discussion in the literature. Second, the other specific capabilities, such as implementing customer centricity, are totally overlooked in online tools, whereas it has been strongly underlined both in the digital management and marketing literature. Third, the

**Table 2** Categories of digital capabilities in the Digi Meter online tool

Dimension in literature	General and specific expression
Meta-digital capability	Developing digital competence <ul style="list-style-type: none"> <li>• Company competence in business models and key themes (e.g. cloud services, Internet of Things, big data) in the digital era</li> <li>• Development of employees' digital competence</li> </ul>
Specific digital capabilities	
Core digital capability	
Performing operational processes	Utilising digitalisation in a company <ul style="list-style-type: none"> <li>• Use of digitalisation in a company</li> <li>• Use of digitalisation across organisational boundaries</li> <li>• Understanding digitalisation as a part of daily operations</li> </ul>
Enabling digital capability	
Transformation capability	Managing the advancement of digitalisation <ul style="list-style-type: none"> <li>• Management's understanding of opportunities provided by digitalisation</li> <li>• Recognition of digitalisation in a strategy</li> <li>• Goal setting for digital business</li> <li>• Role of business culture in inspiring idea generation for digital business</li> <li>• Report on opportunities provided by digitalisation</li> <li>• Company's management is responsible for advancing digitalisation</li> </ul>
Innovation capability	Innovation capability <ul style="list-style-type: none"> <li>• Importance of idea generation in a company</li> <li>• Screening new opportunities provided by the digital era</li> <li>• Connecting the customer to digital projects</li> <li>• Using digitalisation in the development of new products, services and modes of operation</li> </ul>

development of digital competence is a capability that is not recognised in the literature, thus enriching the category with its practical perspective.

Both the literature and the Digi Meter online tool have mentioned, albeit quite implicitly, that individual capabilities play an important role in conjunction with company capabilities. However, the clarification of the content of the individual capabilities remains unclear. The Tiviittori online tool increases understanding of the individual-level capabilities. In light of tool-related dimensions, a summary of the individual tools is presented in Table 3.

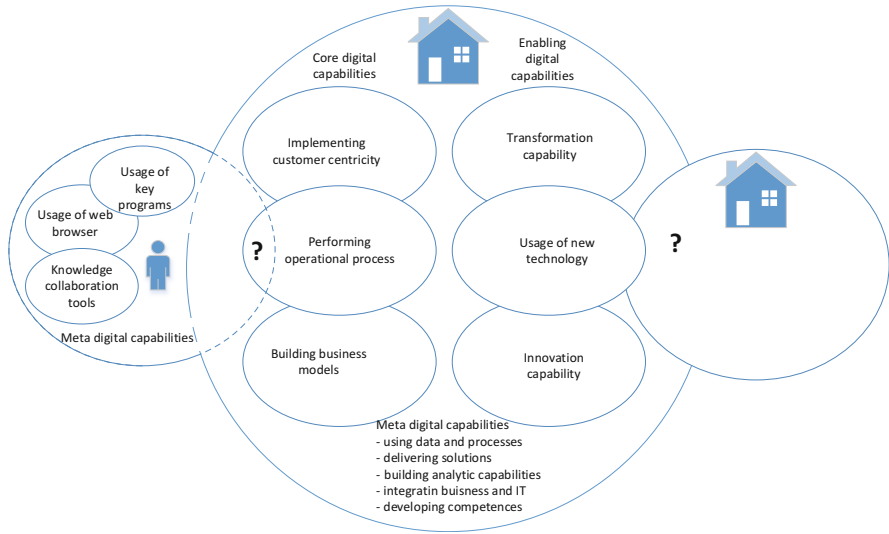
The analysis of the Tiviittori tool shows that there are three key capabilities related to the pre-set skill categories identifiable at the individual level. The first capability describes an understanding of key principles required for safe web usage and is associated with the effective skills for using a web browser. The capability was demonstrated in the demo test in terms of understanding of smart use of websites, skills related to using a web browser, and the process of searching for information. The second capability refers to skills related to using key programs such as word processors, spreadsheets and presentation graphics. The detailed manifestation of the items was the key idea in the demo test. Finally, the third key capability is associated with the knowledge of tools and practices of knowledge work. This was measured by the statements concerning collaborative services and copyright practices. In sum, the key capabilities at the individual level are relevant everywhere and are therefore regarded as meta-digital capabilities at the individual level. However, the context-specific digital capabilities at the individual level need further clarification in the future.

This study identified key digital capabilities both at the company and the individual level. The major categories of digital capabilities can be grouped as shown in Fig. 1.

One of the categories of digital capabilities is meta-digital capabilities. The capabilities can be found both at the company and the individual level. The capabilities cross processes and organisational boundaries. The key categories of

**Table 3** Digital capabilities at the individual level

	Generic expression	Specific expression
Information society and media skills	Understanding of key principles for safe web usage and skills for using a web browser	<ul style="list-style-type: none"> <li>• Understanding of safe usage of websites</li> <li>• Skills for using a web browser</li> <li>• Ways of searching for information</li> </ul>
Technical-practical skills	Skills related to using key programs	<ul style="list-style-type: none"> <li>• Inserting pictures</li> <li>• Calculating a sum of spreadsheet</li> <li>• Grouping of slides and visual presentation technique</li> </ul>
Knowledge work skills	Knowledge of tools and practices of knowledge work	<ul style="list-style-type: none"> <li>• Knowledge of collaborative services such as Facebook and Google+</li> <li>• Knowledge of copyright</li> </ul>



**Fig. 1** Categories of key digital capabilities at the company and the individual level

specific digital capabilities appear at the company level and fall into the categories of implementing customer centricity, performing operational processes, building business models, as well as transformation capability, usage of new technology and innovation capability.

## 5 Discussion

This paper started by arguing that the concept of capability related to IT is vague and the discussion on digital capabilities in tourism literature is scarce and very limited in scope, resulting in a poor description of the dimensions of capability, focusing solely on structural issues in organisations. The extant tourism literature focuses solely on the adoption of IT and other IT-related issues. However, this study shows that the content of digital capability is not only an IT-based issue—it also covers business processes. Hence, digital IT issues and business processes are tightly integrated in the concept of digital capability and cannot be separated from each other. Digital capability is currently as much an IT as a business process, which should also be acknowledged in the discussion on digital capabilities in tourism business literature.

Tourism literature has examined digital capabilities in different contexts, mainly from the perspective of the private enterprise. This study supports the company-level approach to digital capability. However, the individual-level specific digital capabilities and collaborative digital capabilities across company boundaries

continue to be omitted. Without individual digital capabilities, company-level operations remain unsuccessful.

While this paper has offered new ideas in terms of digital capabilities for the use of tourism, there are two notions that deserve further attention in any future discussion; namely, the specification of the individual digital capabilities in the company contexts, and which digital capabilities are required of the effective knowledge worker. While the individual meta-digital capabilities found in this study are also valid in the company context, the company processes require specific digital capabilities from employees for business benefits in particular. A second shortcoming, and thus simultaneously an idea for further research, is the digital capabilities that are required for collaboration with companies across organisational boundaries.

The potential value of this study is its applicability in analysing digital capabilities within different industries. However, the description is conceptual and therefore preliminary in nature, and will be empirically tested in the near future among SMEs in the tourism industry, in particular. Despite its limitations, the paper provides valuable knowledge regarding digital capabilities for tourism management and online tool designers, even at this early stage. From a management perspective, an understanding of what type of digital capabilities are needed and how they can be managed in order to become a digital enterprise deserves primary focus. The description of the categorisation also provides a fruitful avenue for online tool designers for the further development of tools for assessing the digital capabilities of SMEs, particularly those related to the capability of customer centricity, which is totally omitted in the extant studies.

## 6 Conclusions

Our study offers the novel concept of digital capability for tourism literature, showing, in contrast to the extant literature, the key elements in companies that need to be managed in order for their business transformation to be successful. Furthermore, the concept adopts the dynamic approach to capabilities in emphasizing the process rather than the structural element. With the increasing interest among tourism firms in becoming competitive through the use of digitalisation in businesses, our study suggests the improvement of both company-level and individual-level digital capabilities—the key dimensions embraced by the concept. To improve company-level digital capabilities, we emphasise focusing on core and enabling digital capabilities. Additionally, we offer an idea for the online tool designer regarding the design of a tool for assessing customer centricity, the organisation-specific digital capabilities at the individual level, and the capabilities required for managing the use of digitalisation across organisational boundaries. A weakness of our study is that we use only two online tools as cases in demonstrating the digital capabilities, without analysing the activities of the companies in real-life situations. Our study leads to a better understanding of digital capabilities in



tourism literature and is likely to open many new avenues for future research on digital capabilities in the tourism business.

## References

- Bonnet, D., Ferraris, P., Westerman, G., & Afee, A. (2012). Digital Transformation Review 2. [https://www.capgemini.com/resource-file-access/resource/pdf/DigitalTransformationReviewEdition\\_2.pdf](https://www.capgemini.com/resource-file-access/resource/pdf/DigitalTransformationReviewEdition_2.pdf) (Accessed August 18, 2015).
- Chaffey, D. (2010). Applying organizational capability models to assess the maturity of digital-marketing governance. *Journal of Marketing Management*, 26(3–4), 187–196.
- D’Ambra, J., & Mistilis, N. (2010). Assessing the E-capability of visitor information centers. *Journal of Travel Research*, 49(2), 206–215.
- Dubois, A., & Gadde, L. E. (2002). Systematic combining: An abductive approach to case research. *Journal of Business Research*, 55, 553–560.
- Dul, J., & Hak, T. (2008). *Case study methodology in business research*. Amsterdam: Elsevier.
- Fitzgerald, M., Kruschwitz, N., Bonnet, D. & Welch, M. (2013). Embracing digital technology: A new strategic imperative. *MIT Sloan Management Review, Research Report 2013*.
- George, A. L., & Bennett, A. (2005). *Case studies and theory development in the social sciences*. Cambridge, MA: MIT Press.
- Gretzel, U., Fesenmaier, D. R., Formica, S., & O’Leary, J. T. (2006). Searching for the future: Challenges faced by destination marketing organizations. *Journal of Travel Research*, 45 (Nov.), 116–126.
- Ilmarinen, V., & Koskela, K. (2015). *Digitalisaatio: Yritysjohdon käsikirja*. Helsinki: Talentum.
- Koskinen, I., Alasuutari, P., & Peltonen, T. (2005). *Laadulliset menetelmät kauppatieteissä*. Tampere: Vastapaino.
- Mistilis, N., Buhalis, D., & Gretzel, U. (2014). Future eDestination marketing: Perspective of an Australian tourism stakeholder network. *Journal of Travel Research*, 53(6), 778–790.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford: Oxford University Press.
- Reino, S., Frew, A., & Mitsche, N. (2014). A benchmarking framework for eTourism capability of destinations’ industries. *Journal of Hospitality and Tourism Technology*, 5(2), 126–142.
- Silverman, D. (2003). *Doing qualitative research: A practical handbook*. London: Sage.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Tuomi, J., & Sarajärvi, A. (2003). *Laadullinen tutkimus ja sisällönanalyysi*. Jyväskylä: Tammi.
- Uhl, A., & Gollenia, M. L. A. (Eds.). (2014). *Digital enterprise transformation: A business-driven approach to leveraging innovative IT*. Farnham: Ashgate Publishing.
- Uhl, A., Born, M., Koschmider, A., & Janasz, T. (2014a). The importance of technological trends and how to exploit them for business excellence. In A. Uhl & L. A. Gollenia (Eds.), *Digital enterprise transformation* (pp. 1–25). England: Gower.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks: Sage.
- Yuan, Y.-L., Gretzel, U., & Fesenmaier, D. R. (2003). Internet technology use by American convention and visitors bureaus. *Journal of Travel Research*, 41(3), 240–255.
- Yuan, Y.-L., Gretzel, U., & Fesenmaier, D. R. (2006). The role of information technology use in American convention and visitors bureaus. *Tourism Management*, 26, 326–341.

# DataTourism: Designing an Architecture to Process Tourism Data

Fayrouz Soualah-Alila, Mickaël Coustaty, Nicolas Rempulski,  
and Antoine Doucet

**Abstract** With the rapid diffusion of new technologies in tourism, professionals face new challenges to efficiently use the vast amount of data created by tourists. Nowadays, this type of information comes in huge amount and from multiple and varied sources, such as cellular phones or social networks, touristic location attendance or dematerialized satisfaction surveys. It is an important resource for the tourism industry, but its heterogeneity makes it difficult to aggregate and analyze them. The key issue for tourism actors, professional or governmental decision-makers, is to manage and operate tourism information about their territory effectively. The purpose of this paper is to describe synthetically how tourism information is managed under the *Tourinflux* project. In this paper an architecture named *DataTourism* for tourism data management is described. This architecture solves multiple technological bottlenecks encountered when working with tourism data: heterogeneity, quality, interoperability, reusability and standardization.

**Keywords** DataTourism • Tourinflux • TIFSem • TimeML • SentiML

## 1 Introduction

In today's rapidly changing world, much data related to tourism is produced. This is primarily the result of increasing possibilities to digitize growing volumes of data, and of the development of open-source and open-data policies. Likewise, more and more data is being generated by sensors, mobile telephones, and connected devices on the one hand, and by the democratization of comparative services dedicated to tourism on the other hand, as Kayak or Yelp for instance. Most of this data could be collected and used by decision-makers to efficiently assign public funds to increase tourist attendance and satisfaction and thus making their territory attractive. But today, they are mostly unused or inefficiently assigned due to a lack of suitable tools.

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However, the business sector is already using this data. It is analyzed for marketing strategies, predicting trends and also for producing detailed statistics. Tourism professionals are using multiple sources, and fully use the recent development of the World Wide Web and its social services. The web has changed people's daily life, which is also true for tourism. It has significantly influenced the way information about users is gathered and exchanged in the tourism sector. With the intensive use of social networks and web sites specialized in e-tourism (TripAdvisor, Booking.com, etc.) web users are no longer passive recipients of contents; they absorb information from the web and in return produce their own new content. But when users collect this type of information, from professional sources or from other users, they also create their own set of information: tourism goods they are looking for, future date of their vacation, etc. Professional tourism services collect this data while providing information or services to users. The same example could be made with cellular carriers, which are tracking movements of their users. This information, wherever it comes from, is then used to improve the service quality by enhancing employee's knowledge about customer's preferences and opinions.

Two main problems occur with tourism data management: their heterogeneity and their volume. As mentioned before, tourism information is continuously enhanced and updated using dedicated websites. These data are contained on web pages that are originally designed to be human-readable, and so, most of information currently available on the web are kept in large collections of textual documents. As the web grows in size and complexity, there is an increasing need for automating time consuming tasks, such as information extraction and interpretation. Some automatic process to annotate and enrich textual information knowledge is thus needed.

The domain of tourism is characterized by significant information heterogeneity and by a high volume of online data. Data related to tourism are produced by different experts (travel agents, tourist offices, etc.) and by visitors, thus creating an heterogeneous data set from a semantic and typology point of view. Moreover, this set is often incomplete and inconsistent. For instance, these data could contain information related to tourism objects (hotels, concert, restaurant, etc.) with raw information, service description for instance, temporal information, about opening hours or days in the week, and opinions, such as users' satisfaction ratings and comments. There are already numerous taxonomies and catalogues which are designed and used internally by tourism actors to allow them to efficiently manage heterogeneous tourism data. Efforts are now made to generate standards to facilitate inter- and intra-tourism data exchange.

The Tourinflux<sup>1</sup> project falls within this context and addresses one central need: to help professional and political actors of the tourism domain to develop the success of their territory. One way to promote territories is to generate reports, also named dashboards, based on enriched data collected from Tourist Information

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<sup>1</sup> <http://tourinflux.univ-lr.fr/index.php/component/content/?view=featured>

Systems (TIS) and the web. The emergence of dashboards was a consequence of managers' needs to monitor a complex subject with indicators clearly showing how a territory's tourism activities are perceived and evaluated. Experts from tourism industry use and need these dashboards to improve their knowledge about the tourist attractiveness of their territory. But generating dashboards is a problem: as explained above, the heterogeneity in the way information is structured and interpreted leads to conflicts when rich information from different sources needs to be combined. The unstructured nature of data and lack of global schemas means that the available tourism information is human-readable only and not meaningful to machines. Experts from tourism industry are then restricted by the available tools and data structures at their disposal, especially as the task of integrating of heterogeneous data is a time consuming and tedious task to do. Tourism industry needs to access to new tools to increase information suppliers and to easily produce, transmit, access and share knowledge and dashboards.

The technical architecture created in TourinFlux is aimed at providing the tourism industry with a set of tools (1) allowing them to handle both their internal data, and the information available on the web, and (2) allowing to improve the displayed information available about their territory on the web. In this paper an overall description of how tourism data, composed of information related to tourism objects (TO), temporal information and opinions, are managed under the TourinFlux project, is presented. An architecture named *DataTourism* for the management of tourism data is presented. It allows solving different bottlenecks: heterogeneity of tourism data sources, quality of these data, interoperability, reusability and standardization.

## 1.1 *Designing Touristic Dashboards*

A touristic dashboard is a set of management indicators, built periodically, for a tourist actor or a group of tourist actors, in order to guide their decisions and actions to achieve performance goals. A touristic dashboard is considered as:

- An instrument of control and comparison: It allows tracking the evolution of tourist offers;
- A decision support system to help taking decision: It communicates key information to decision-makers about a touristic activity;
- A communication tool: It provides a permanent communication between the various tourism actors and between different hierarchical levels;
- A monitoring tool: It allows to identify emerging opportunities and risks.

Figure 1 shows a dashboard example from a socio-touristic information report (TourinFlux, 2015).

In France, it exists five main institutional publishers of touristic dashboards: tourist offices, Departmental Tourist Committees (DTC), General Directory of Enterprises of the French ministry of economy (DGE), National Institute for

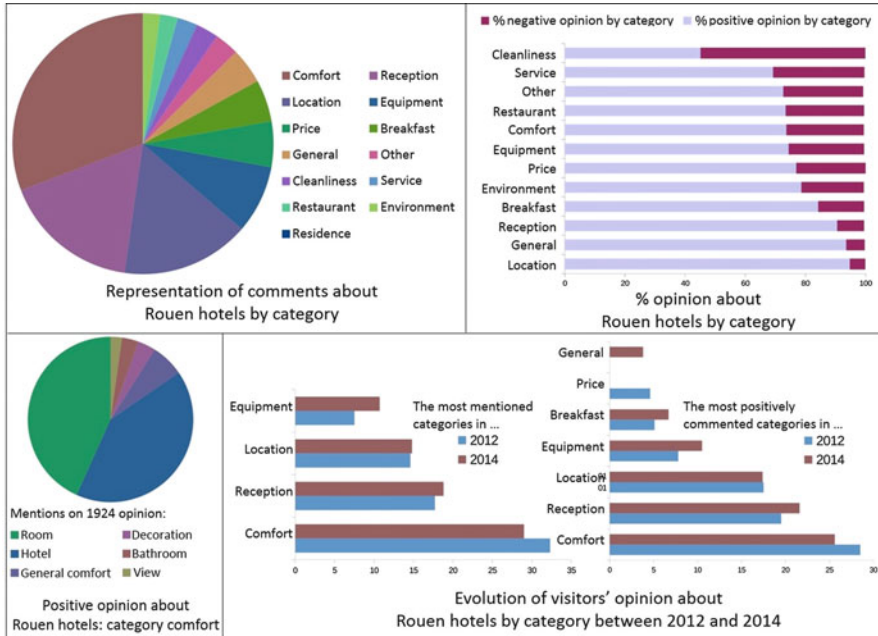


Fig. 1 Example of dashboard

Statistics and Economic Studies (Insee) and the French tourism development agency (Atout-France). Today, each of these publishers has independently developed various techniques to assess a territory (a city, a department, a region, the whole country) and despite all the efforts made so far in developing their own dashboards, these ones have remained insufficient to fulfil the goals described above. More specifically:

- They do not sufficiently represent the tourism activities of a territory. They focus mostly on accommodation and lack other sources of information such as opinion and visitor intents;
- They are limited to the scale of the territory they are developed for. It is impossible to generate dashboards at all hierarchical levels (department, country) or make a comparison between territories. This is mainly due to the heterogeneity of these TIS.

In order to generate rich dashboards, it is necessary to optimally exploit all information available. The data sets used have to be as exhaustive and varied as possible to faithfully reflect the touristic activity of a territory.

In the next section an overview of possible sources and types of tourism data is given, and the current limitations of existing systems are highlighted. Section 3 is devoted to the description of our *DataTourism* architecture for the aggregation of

tourism information from different data sources, and the first experimentations led in this way. Finally, Sect. 4 will conclude the paper.

## 2 e-Tourism Issues: Sources and Types of Data

### 2.1 Sources and Types of Tourism Data

The tourism industry is by nature strongly based on data exchange. In the last decade, more and more data has become available for research and development. This data stems from different sources. The main sources of tourism data which are consider as part of this project are the data available in the different TIS, the data available on the web and open data. These data could be composed of (1) information related to tourism objects (hotels, concert, restaurant, etc.), (2) temporal information and (3) events and opinions.

Our architecture generate dynamic dashboards through four major phases: integration of information related to tourism objects in the system, annotation of temporal information and opinions in web pages, enhancement of the tourism objects from the annotated information, and finally dynamic generation of dashboards. All the components that are used in each phase are illustrated in Fig. 2.

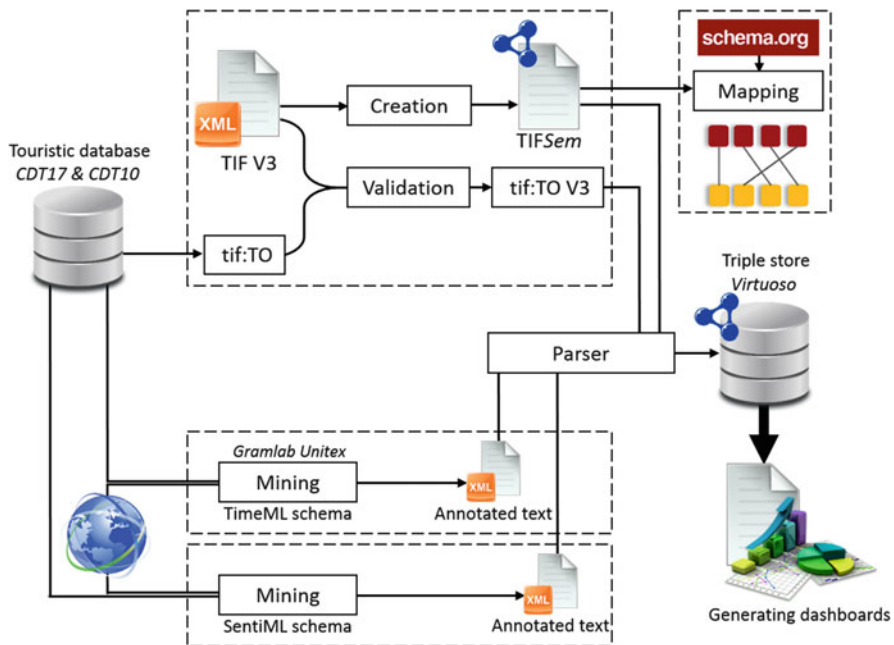


Fig. 2 DataTourism general architecture

The following sections describe briefly how tourism objects are modelled and how temporal information and opinions in web pages are annotated, so as to complete the description of tourism objects.

## 2.2 *Tourism Objects Modelling: Current Limitations*

The interoperability of TIS is a major challenge for the development of tourism. Several national, European and international institutional initiatives have proposed different standards to meet the specific needs of tourism professionals, but no international standard have been successfully defined (World Tourism Organization, 2004). French Tourism Actors, in association with the French Ministry of Tourism, created the TourInFrance (TIF) standard in 1999 in order to ease the exchange of tourism data. Major French Tourism Information System such as Raccourci Interactive,<sup>2</sup> TourinSoft<sup>3</sup> and Sitra,<sup>4</sup> adopted the TourInFrance standard (TIF) at the beginning of the 2000s. It is used today by more than 3000 tourist offices in France, by DTC and by different tour operators, to facilitate data exchange between these different actors. In 2004, the TourInFrance Technical Group (TIFTG) approved the new version of the standard, TIF V3. In this version, the standard has evolved towards XML technologies to facilitate the publication of information on the web and the exchange of information between systems. It comes together with several thesaurus. Since 2005, this standard stopped evolving. As a result, tourism professionals have adapted the standard to their own needs (new tags added, varying syntax, etc.) and proposed their own evolution in an unorganized way. With the creation of web technologies and the democratization of open-data, this standard became outdated and TIS lost their inter-compatibilities and cannot directly share their data using international standards. Finally, the lack of international standards, in accordance with the exploitation of tourism information, are trapped in their own territory, and thus it is a complicated task to aggregate these information (Bittner, Donnelly, & Winter, 2005).

Based on this inventory, the next section presents a new system for tourism data management. The challenge confronted in this paper imposes two major restrictions. First, the designed system must be able to model and structure knowledge from the domain of tourism and those from the lingual domain, while being inter-connectable with semantic existing systems. On the other hand, this system must address the problem of big data as a huge volume of opinion data are produced every day on the web, and ontologies may be overpassed by the quantity of data to perform and to share. This model must then be able to deal with the need of velocity. We therefore propose to use a combination between dedicated annotation

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<sup>2</sup> <http://www.raccourci.fr/>

<sup>3</sup> <http://www.tourinsoft.com/>

<sup>4</sup> <http://www.sitra-tourisme.com/>

languages to be able to treat quickly large corpus, while ontologies give a global framework to structure data and to ensure their inter-compatibilities. Finally, this system can be easily linked to web semantic technologies in order to ease the production of dashboard and the exchange of data (like dashboards for tourism actors).

### 3 Overview of the Proposed Approach

To overcome these limitations, a proposition would be to evolve the TIF standard to share the knowledge it contains and to ensure data interoperability, by applying the concept of ontology to represent the standard terminology. This new standard is based on the French initiative, but is not limited to French data. All its components remain generic and can be easily adapted to the international market.

Ontologies have been chosen as they are defined as “the specification of a conceptualization”, in other words, as “a specific artifact designed with the purpose of expressing the intended meaning of a shared vocabulary” (Hirst, 2004).

Having a common semantic base alleviates the interoperability bottleneck (Fodor & Werthner, 2005) that comes along with the integration of heterogeneous data sources by converting existing heterogeneous unstructured tourism data into structured ontological data. In the tourism area, some research work has already tackled the design of ontologies. Several available tourism ontologies show the current status of the efforts: the OTA (Open Travel Alliance) (OTA, 2000), the Harmonise ontology (Dell’Erba, Fodor, Ricci, & Werthner, 2002), the Hi-Touch ontology (Legrand, 2004), the QALL-ME ontology (Ou, Pekar, Orasan, Spurk, & Negri, 2008), the Tourpedia catalogue (Cresci et al., 2014), etc. These models focus on different areas of the tourism domain, but none of them deals with all the areas together, hence failing to provide an overview of the data required for a full dashboard. To the best of our knowledge, no unique ontology exist to overcome this problem.

As shown in Fig. 2, the global organization of the proposed standard relies on a modular framework, and is actually composed of three main components:

1. An evolution of TIF into TIFsem in order to store tourism data in a format compatible with the semantic web technologies so as to ease the sharing and the search of data;
2. An evolution of the TimeML standard in order to adapt it to the specificities of temporal data;
3. An evolution of the SentimL standard in order to be able to deal with opinion data.



### 3.1 *Tourism Data Standard*

As mentioned previously, no international standard actually exist for tourism data exchange and reasoning. This standard must be able to offer two kinds of services (knowledge extraction and reasoning and knowledge sharing), and to deal with heterogeneous information (textual information, GPS position, meteor or temporal data, etc.). An heterogeneous solution is proposed combining ontology for the structuration and the reasoning part, and a full-compatibility with Schema.org<sup>5</sup> formalism, internationally recognized for its ability to share and to spread knowledge.

For the first part of our model, an ontology called TIFSem (Semantic TourInFrance) is proposed to globally describe tourism objects mixing heterogeneous content (Soualah-Alila, Faucher, Bertrand, Coustaty, & Doucet, 2015). We chose to re-design the TIF standard in TIFSem for reasoning purposes. An ontology for tourism domain implements mechanisms of deductive reasoning, automatic classification, information retrieval, and ensure interoperability between TIS. Concepts included in the defined ontology will allow to describe information sources on tourism. This model allows enriching the tourism information to be used: (1) from the user side, to match tailored package holidays to client preferences for instance, and (2) from tourism experts' point of view, to analyze and better manage online data about their territory. As tourism dashboards require to analyze vast amount of data, reasoning can lead to better indicator. For instance, it can help profiling tourist based on their behavior in an area with simple set of rules.

In order to elaborate the TIFSem ontology, we exchanged with different tourism actors to understand their domain, their specific data and create concepts related to this specialized domain. We collaborated with sources from the Departmental Tourism Committee of the Charente Maritime<sup>6</sup> (CDT17) and the Departmental Tourism Committee of the Aube<sup>7</sup> (CDT10). We are also in the process of extending the TIFSem ontology by collecting content from more tourism service providers abroad from France.

Our second goal is to ensure that TIFSem is compatible with current data crawling and data publication technologies. As TIF standard is unable to easily share and interoperate with global standards from the Web, we propose to enrich the TIFSem ontology with the Schema.org model. This schema, initiated few years ago by Bing, Google and Yahoo, aims to standardize structured data formats of the semantic web and is a *de facto* norm to easily share semantic content in the web.

Launched in 2011, Schema.org aims to create and to support a common set of schemas for structured data mark-up Web pages in a way recognized by major search providers, and that can also be used for structured data interoperability (RDFa, JSON-LD, etc.). When these tags are used in a website, search engines

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<sup>5</sup> <https://schema.org>

<sup>6</sup> <http://www.charente-maritime.org/>

<sup>7</sup> <http://www.aube-champagne.com/>

can better interpret the meaning of its embedded resources (text, image, video) (Toma, Stanciu, Fensel, Stavrakantonakis, & Fensel, 2014).

The proposed model tends to match terms of TIFSem with terms of Schema.org by using semantic relations. Moreover, by working with the Schema.org community, we intend to extend the schema, either formally by adding new terms or informally by defining how Schema.org can be combined with some additional vocabulary terms.

The global model obtained by mixing these two tools is presented in Fig. 2. In order to feed this model, the next sections present how we interfaced it with automatic processing techniques for the extraction of basic information, related to the tourism domain (time, opinions). This allow us to start from documents, extract some keywords and annotations, insert them into our model to finally infer new knowledge and provide higher level of semantic. In the following sections we describe how in our architecture we integrate information about time and opinions to complete the TIFSem model.

### ***3.2 Tourism Temporal Data***

The first extension of the TIFSem model relies on the use of temporal information in tourism corpora. Temporal data are pieces of information frequently encountered in tourism web pages. Most tourism objects (events, hotels, restaurants, etc.) on the web are associated to periods and events and are characterized by different timestamps like date, duration, opening hours, opening conditions, frequency, etc. Textual tourism data on the web is a rich body of phenomena for linguistic analysis. The automatic recognition of temporal and event expressions in natural language text has recently become an active area of research in computational linguistics and semantics.

Temporal annotation is an essential part of many text understanding efforts. Recent efforts such as TIDES (Translingual Information Detection, Extraction, and Summarization) (Ferro, Mani, Sundheim, & Wilson, 2001), STAG (Sheffield Temporal Annotation Guidelines) (Setzer, 2001; Setzer & Gaizauskas, 2001) and TimeML (Pustejovsky et al., 2005) all aim to provide a markup language for temporal annotation. TIDES defines a set of guidelines for annotating time expressions with a representation of the times they refer to. STAG provides guidelines for annotating events and temporal information in newswire texts. TimeML is an extension of TIDES and STAG. In our proposed model, events will be annotated according to the TimeML language, a robust specification language for the challenging task of annotation of temporal information over natural language text. Under the TourinFlux project, a state of the art has been proposed by (Drat, 2014) in order to justify the use of this language.

TimeML has been developed in the context of AQUAINT workshops and projects. The 2002 Time and Event Recognition for Question Answering Systems (TERQAS) workshop set out to enhance natural language question answering

systems to answer temporally-based questions about the events and entities over free text on the web. This is when the first version of TimeML was defined and the TimeBank corpus created as an illustration. In 2003, TimeML was further developed in the context of the TimeML Annotation Graphical Organizer (TANGO) workshop. In 2009 TimeML has been developed into an ISO standard (ISO WD 24617-1:2007).

TimeML includes four major data structures: EVENT, TIMEX3, SIGNAL, and LINK. In TimeML, *events are situations that occur or happen, or predicates that describe states or circumstances in which something obtains or holds the truth* (Pustejovsky et al., 2003). Events in TimeML are annotated with the tag EVENT. TIMEX3 is used to tag explicit temporal expressions, such as time, dates, and durations. SIGNAL is used to annotate sections of text, typically function words that indicate how temporal objects are related to each other (when, during, before, etc.). Finally, LINK encode various relations that exist between the temporal elements of a content. Each of these tags are associated to attributes to integrate temporal expressions. As the description of TimeML is not the aim of this paper, a complete description of the language is given in its manual (Sauri, Goldberg, Verhagen, & Pustejovsky, 2009).

Within the Tourinflux project, in order to facilitate the extraction of temporal data, a corpus of Web pages linked to tourism is created in the purpose of being analyzed. This corpus consists of:

- A free text corpus containing festivals and events description, provided by the Local Action Group of *Othe Armanche*<sup>8</sup>. This corpus is available under LGPL/LR license (Lesser General Public License for Linguistic Resources);
- A corpus provided by the CDT10. This corpus contains descriptions of Places of Interest (POI): hotels, restaurants, etc., In particular, it contains information about opening and closing dates, opening and closing times, etc.;
- Open data, including data concerning national museums.

We perform the annotation of our corpus annotation with temporal expressions with a set of finite state transducers, developed with the Gramlab Unitex<sup>9</sup> corpus processor. Unitex is a corpus processing system for analyzing natural language texts using resources such as dictionaries and grammars. Gramlab is an integrated development environment, based on the Unitex software components, designed for industrial project management purpose. Before applying the transducers, Unitex performs some pre-processing that consists in cleaning the text, by (1) normalizing apostrophes, quotes etc., (2) segmenting the text into sentences and tokenizing it and (3) applying a number of built-in lexical resources, such as dictionaries to identify, for instance, compound word forms, proper names, etc. (Paumier, 2008). Once the text is cleaned, temporal expressions are tagged according to their TimeML type. The tagger performs the identification of events. Then Unitex

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<sup>8</sup> <http://www.tourisme-othe-armance.com/>

<sup>9</sup> <http://www-igm.univ-mlv.fr/~unitex/>

detects and annotates temporal expressions and calculates the attribute value for each of the tags as specified by the TimeML guidelines. The tagger also detects certain relation markers, such as temporal prepositions like before, after, etc. The last spot of the tagger is to determine the links between the different annotations. The resulting output of Gramlab is the original corpus annotated with EVENT, TIMEX3, SIGNAL and LINK tags, whose values can later be integrated within the TIFSem model. The results of our work on opinion annotation with SentiML are presented in Drat (2014).

### 3.3 *Tourism Opinion Data*

An important part of our information-gathering behavior has always been to find out what people think about their touristic experience. Opinions help to analyze a situation from different aspects and take an appropriate decision. The opinion of one individual may influence another individual's opinion and hence the concept of public opinion is generated. Public opinion is very important in the tourism domain.

The amount of opinionated data on tourism websites has exponentially increased especially after the rapid growth of online social networks. With the availability and popularity of rich opinion resources, we need to have reliable mechanisms to identify all aspects of opinion in a text and extract useful related information. Thus, we introduce the concept of opinion mining.

Opinion Mining is the process of automatic extracting opinions from textual segments (Liu, 2012). In the literature, it has commonly been referred to as sentiment analysis or sentiment classification and sometimes as subjectivity analysis (Cambria, Schuller, Xia, & Havasi, 2013). There are many related sub-tasks of opinion mining, such as the semantic annotation of opinions. Semantic annotations are essential both to prepare data for machine learning and to evaluate opinion mining approaches. Some annotation schemas have been proposed by the research community such as SentiML (Di Bari, Sharoff, & Thomas, 2013), OpinionMining-ML (Robaldo & Caro, 2013) and EmotionML (Schröder et al., 2011). A comparative study between the existing annotation schemas is presented by (Malik et al., 2014) as part of the project TourinFlux.

In our case, we used SentiML for annotating opinion data. In SentiML we talk about sentiments rather than opinions. The goal of SentiML is to identify and classify sentiment groups (positive and negative) at the sentence level. In order to do this, the schema focuses on three categories: target (expression the sentiment refers to), modifier (expression conveying sentiment) and appraisal. A target is any entity (object, person or concept) that is implicitly or explicitly regarded as positive or negative by the author of the text. A modifier is what modifies the target. It can be an adjective, a verb, an adverb or a noun. However, SentiML also adds in its vocabulary the much needed appraisal tag. An appraisal group represents an opinion on a specific target. For this reason, it is defined as the link between the target and the modifier (e.g., link between a noun and an adjective, or between a

verb and an adverb, etc.). Besides this, SentiML is based on the Appraisal Framework (AF) which is a strong linguistically-grounded theory. AF helps to define appraisal types (affect, judgments and appreciation) within the modifier tag. The results of our work on temporal annotation with TimeML are presented in the report of (Malik et al., 2014).

## 4 Conclusion

In this paper, we presented some early stage work in the TourInflux project on identifying a new architecture named *DataTourism* for tourism data management. We described in a general way how tourism data are managed to help experts from tourism industry to generate dashboards to improve their knowledge about the tourist attractiveness of their territory. This architecture is being built. The three main components of the architecture (the evolution of TIF into TIFsem, the annotation of temporal data with TimeML and the annotation of opinion data with SentiML) has been validated. The overall framework is being tested and evaluated with partners. One of the limitations of the project is that it is actually restricted to a national level. We are also working on extending *DataTourism* for managing tourism data at an international level. We are also in the process of extending the TIFsem ontology by collecting contents about more touristic service providers. We are also working on us cases for generating dashboards and providing semantic and contextual answers to queries.

## References

- Bittner, T., Donnelly, M., & Winter, S. (2005). Ontology and semantic interoperability. In S. Zlatanova & D. Prospero (Eds.), *Large-scale 3D data integration: Challenges and opportunities* (pp. 139–160). Boca Raton: CRC.
- Cambria, E., Schuller, B., Xia, Y., & Havasi, C. (2013). New avenues in opinion mining and sentiment analysis. *IEEE Intelligent Systems*, 28(2), 15–21.
- Cresci, S., D’Errico, A., Gazze, D., Duca, A. L., Marchetti, A., & Tesconi, M. (2014). Towards a DBpedia of tourism: The case of tourpedia. In *International Semantic Web Conference* (pp. 129–132).
- Dell’Erba, M., Fodor, O., Ricci, F., & Werthner, H. (2002). Harmonise: A solution for data interoperability. In *Towards the knowledge society: eCommerce, eBusiness, and eGovernment, the Second IFIP Conference on E-Commerce, E-Business, E-Government* (pp. 433–445).
- Di Bari, M., Sharoff, S., & Thomas, M. (2013). Sentiml: Functional annotation for multilingual sentiment analysis. In *1st International Workshop on Collaborative Annotations in Shared Environment: Metadata, Vocabularies and Techniques in the Digital Humanities, DH-CASE’13* (pp. 15:1–15:7). New York: ACM.
- Drat, L. (2014). *Projet TourInFlux. Annotation des Expressions Temporelles*.
- Ferro, L., Mani, I., Sundheim, B., & Wilson, G. (2001). TIDES Temporal Annotation Guidelines, Version 1.0.2. *The MITRE Corporation, McLean, Virginia. Report MTR 01W000041*.

- Fodor, O., & Werthner, H. (2005). Harmonise - a step towards an interoperable e-Tourism marketplace. *International Journal of Electronic Commerce*, 9(2), 11–39.
- Hirst, G. (2004). Ontology and the lexicon. In S. Staab & S. Studer (Eds.), *Handbook on ontologies* (pp. 209–229). Berlin: Springer.
- Legrand, B. (2004). *Semantic web methodologies and tools for intra-European sustainable tourism*. White paper, Paris, Mondeca.
- Liu, B. (2012). Sentiment analysis and opinion mining. In *Synthesis lectures on human language technologies*. San Rafael, CA: Morgan & Claypool.
- Malik, M., Missen, S., Attik, M., Coustaty, M., Doucet, A., & Faucher, C. (2014). SentiML ++: An extension of the SentiML sentiment annotation scheme. In *The 12th Extended Semantic Web Conference (ESWC2015)*.
- OTA. (2000). *Opentravel Alliance. Opentravel Alliance message specifications*. Specifications Document 1.
- Ou, S., Pekar, V., Orasan, C., Spurk, C., & Negri, M. (2008). Development and alignment of a domain-specific ontology for question answering. In N. Calzolari, K. Choukri, B. Maegaard, J. Mariani, J. Odjik, S. Piperidis, et al. (Eds.), *The Sixth International Language Resources and Evaluation Conference* (pp. 2221–2228).
- Paumier, S. (2008). *UNITEX 2.0: User manual*.
- Pustejovsky, J., Castano, J., Ingria, R., Sauri, R., Gaizauskas, R., Setze, R. A., et al. (2003). TimeML: Robust specification of event and temporal expressions in text. In *IWCS-5 Fifth International Workshop on Computational Semantics*.
- Pustejovsky, J., Ingria, B., Sauri, R., Castano, J., Littman, J., Gaizauskas, R., et al. (2005). The specification language TimeML. In *The language of time: A reader* (pp. 545–557). Oxford: Oxford University Press.
- Robaldo, L., & Caro, L. D. (2013). OpinionMining-ML. *Computer Standards & Interfaces*, 35(5), 454–469.
- Sauri, R., Goldberg, L., Verhagen, M., & Pustejovsky, J. (2009). *Annotating events in English, TimeML annotation guidelines, version TempEval-2010*.
- Schröder, M., Baggia, P., Burkhardt, F., Pelachaud, C., Peter, C. & Zovato, E. (2011). Emotionml - an upcoming standard for representing emotions and related states. In *Affective computing and intelligent interaction*, Berlin: Springer.
- Setzer, A. (2001). *Temporal information in newswire articles: An annotation scheme and corpus study*. Ph.D. thesis, University of Sheffield, Sheffield, UK.
- Setzer, A., & Gaizauskas, R. (2001). A pilot study on annotating temporal relations in text. In *ACL 2001, Workshop on Temporal and Spatial Information Processing*.
- Soualah-Alila, F., Faucher, C., Bertrand, F., Coustaty, M., & Doucet A. (2015). Applying semantic web technologies for improving the visibility of tourism data. In *CIKM'15 Workshop on Exploiting Semantic Annotations in Information Retrieval ESAIR'15*.
- Toma, I., Stanciu, C., Fensel, A., Stavrakantonakis, I., & Fensel, D. (2014). Improving the online visibility of touristic service providers by using semantic annotations. In *The semantic web: ESWC 2014 satellite events* (pp. 259–262), Anissaras, Crete, Greece.
- TourinFlux. (2015). *Ville de Rouen: Rapport d'informations socio-touristiques*.
- World Tourism Organization. (2004). *Information and documentation resource centres for tourism: Guidelines for establishment and maintenance*. ISBN: 9284407176, 9789284407170, 132.

# The Role of Culture on Online Search Behaviour: A Comparative Study Between British and Chinese Travellers

Elina (Eleni) Michopoulou and Delia Moisa

**Abstract** This study explores the role of culture and its impacts on travellers' online information search behaviour. The study is focused on two culturally diametric countries: United Kingdom and China (Hofstede, *Psychology and Culture*, 2(1), 2011) and they have been selected as case studies, representing values from the Western and the Asian cultures. The research adopted a qualitative approach, and data was collected through interviews in order to enhance the understanding on the subject studied. Findings indicate that culture influences considerably the travellers' behaviour in the online environment, and as a result of this influence, different behavioural patterns between the British and the Chinese travellers emerged. Conclusions discuss the implications for marketers aiming at the British and the Chinese tourists, and they highlight the need to adopt different strategies in designing and promoting their tourism products for these two particular markets.

**Keywords** Online search behaviour • Culture • e-Tourism • Online decision making

## 1 Introduction

With the proliferation of the internet across the globe, it has become apparent that societies have been evolving and people's lifestyles are changing (Buhalis & Law, 2008). During the year 2014, over 7 billion people had access to the Internet, an increase of 741.0 % since the year 2000 (Internet World Stats, 2015), suggesting high rates of growth registered also in the travel sector. Developments in speed of networks, carrying capacities and search engines highly influence the numbers of travellers around the world using technology to plan and experience their travels

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(Buhalis & Law, 2008). Moreover, it has been recognized that the use of the Internet to search for travel information is highly more popular in contrast to traditional media, and this phenomenon continues to increase (Fesenmaier, Cook, Sheatsley, & Patkose, 2009).

Recent statistics show that approximately 87 % of the adult population in Great Britain uses the Internet (ONS, 2014). At the same time, the Asian market holds the highest numbers of Internet users in the world, with China accounting 632 million Internet users by the end of June 2014 (CNNIC, 2014). Considering this large population of Internet users, and the fact that China continues to be the largest outbound tourism market in the world for 3 consecutive years since 2012, (together with the continuous increase in consumer spending), obtaining a better understanding upon the Chinese's preferences and the role Internet plays in their decisions becomes particularly relevant. While the online market continues to grow at a relentless pace, Western companies are facing a tough challenge and they find themselves in direct competition with Chinese providers like Renren, Baidu, or Sina Weibo (ISN, 2012). China differs fundamentally in a number of ways from the United Kingdom, in terms of culture, language spoken, online environment and access to information. Hence, it can be argued that consumers from the two different regions could behave differently when searching for information on the Internet prior to making a travel related purchase.

The Chinese Internet landscape is very different from anywhere else in the world (ISN, 2012) as China is facing limitations in terms of accessibility to some of the world's most famous search engines such as Google, and social media platforms including Facebook and Twitter. The main players are all Chinese, but they all have equivalents from the western part of the world. Keegan and Schlegelmilch (2001) state that culture only influences consumer behaviour on the environmental sensitive products such as food, where international companies are forced to respond to the nation's different tastes. However, it is more than just a language barrier which could easily be overcome by changing the settings on the Internet. While marketers mostly focus on increasing their visibility in the online environments through search engine optimizations, content creations, or paid advertisements, a high ranking in the search results might not result in higher traffic on the page, neither higher conversion rates. While Western companies remain focused on having a foothold in the world's largest online marketplace, it is important to recognize that once the population moves online, the consumer behaviour shifts. Information and Communication Technologies have not only changed the way in which tourism businesses are conducted in the marketplace, but also the how consumers interact with these organisations (Buhalis & Law, 2008). This study provides new insights into the cultural differences between the East and the West, affecting the users' way of accessing the Internet for travel-related purposes, indicating how suppliers can promote their tourism products across these cultural contexts.



## 2 Theoretical Background

### 2.1 *Tourist Behaviours in Information Search*

The process of information search represents one of the very first steps of the travel decision making, and it includes the travellers' awareness of choice and selection regarding the destination visited, as well as on-site activities, accommodations, or tours (Chen & Gursoy, 2001; Fodness & Murray, 1999). Moreover, Engel, Blackwell, and Miniard (1995) defined the information search as a motivated activation of knowledge stored in memory or acquisition of information from the environment. As the definition implies, the information can be either internal, such as previous experiences and knowledge, or external, involving a broad of other sources such as family, friends, media, and travel consultants (Gursoy, 2003). There is a substantial number of previous studies attempting to understand the information search behaviour exhibited by travellers during their various stages of the travel planning process (Chen & Gursoy, 2001; Fodness & Murray, 1999; Gursoy, 2003; Gursoy & Chi, 2008; Gursoy & McCleary, 2004), with various authors confirming that tourists are motivated by functional, hedonic, innovation, and aesthetic needs (Peng, Xu, & Chen, 2013). This body of literature covers a range of subjects from information search and experience to information search and welcome centers as well as information searcher typology (Fodness & Murray, 1999; Gursoy & Chi, 2008).

While these studies were based on the information search using the traditional forms of communication, the Internet changed radically the classic communication distribution model (Gursoy & Chi, 2008). Thakran and Verma (2013) confirm that we entered into a hybrid Era, where the customers are increasingly depending on online search, and they do this by using multiple screens at different times of the day. The proliferation of the Information and Communication Technologies fundamentally revolutionized the way experiences are created and they support tourism consumers throughout all the stages, starting from the process of information search, to the decision making process, planning, communication, retrieval of information, and sharing the experiences (Crouch & Desforges, 2003; Stamboulis & Skayannis, 2003). The technologies are therefore implemented to support and facilitate travel activities and enhance the tourist experience, through the use of websites, blogs, recommendation systems, social networking, virtual communities, and mobile devices (Gretzel, Fesenmaier, & O'Leary, 2006).

A previous study on 15 participating countries in the Cisco Connected World Technology Report (2014) demonstrated that the Generation X (aged between 31 and 50) and Generation Y, also known as the Millennials (aged between 18 and 30) use two to three work and personal devices in their daily lives, with mobile internet becoming a more popular medium in travel information search rather than PC and traditional media (Okazaki & Hirose, 2009). They are technologically savvy, heavy Internet users (Nielsen, 2014), and the perceived social impact caused by sharing travel experiences is a considerable criterion for these

generations. Social media stimulates tourists to “dream” about travelling experiences through the pictures, videos, and updates shared by their friends. Therefore, they engage with travel products and various brands without being in the stage of purchase or active travel information seeking (SE1 Media, 2015).

Literature on travellers’ information search behaviour reveals that the way in which tourists look for information has often been used as a segmentation criterion in tourism studies ( Bieger & Laesser, 2004; Buhalis & Michopoulou, 2011). Gursoy and Chi (2008) stipulate that an important factor likely to influence the way travellers use the Internet or other sources of information, and influence their decision making process, is represented by the individual’s culture. Considering the fact that human behaviour is culture-bound rather than culture free, the suppliers involved in distributing travel related services through the use of the Internet, must be able to cater for the needs of tourists from various backgrounds, and learn how to use appropriate communication and marketing channels.

## ***2.2 Impact of Culture on Information Search Behaviour***

Hofstede (2001) identified culture as an identity which helps to distinguish one group of people from another, and Keegan and Schlegelmilch (2001) suggest that the culture is formed within the community and over the years, being passed on from one generation to another. In other words, the culture offers a guideline for its members to decide how, what and why to do certain things; it shapes human behaviour by transmitting certain values, beliefs and norms. Culture dictates an individual’s way of living, and thinking, an element that becomes highly important in this particular case, as it also brings implications for the usage of the Internet.

Hall’s (1976, 1990) two dimensions of culture for context and time, argue that meaning is formed based on how information is perceived, and the form and function of information varies between cultures (Topi & Tucker, 2014). Therefore, the high context cultures mostly rely on implicit information, fast and efficient communication, embedded in a context of social cues such as body language, eye movement, and silence. In contrast, low-context cultures rely on explicit forms of communication coming directly through verbal channels.

For more than 30 years Hofstede’s work (1991, 2001, 2010; Hofstede and Hofstede, 2005) has been the base on which various researchers relied in order to make comparisons based on country affiliation (Topi & Tucker, 2014), with his dimensions of power distance, individualism-collectivism, masculinity-femininity, uncertainty avoidance and long-term/short-term orientation being frequently used in Information Systems research, and especially in e-commerce (Vyncke & Brengman, 2010). While the validity of using Hofstede’s (1991, 2001) finding has been widely questioned, the numerous quantitative and qualitative studies from various disciplines support his findings (Sondergaard, 1990) and Hofstede’s classifications are often used in social psychological phenomena (Gefen & Heart, 2006), computer self-efficacy (Srite, Thatcher, & Galy, 2008), and especially in

studies of cross-cultural differences in an e-business context (Cyr, Head, Larios, & Pan, 2009). Researchers agreed that culture determines the acceptable forms of communication, the nature and the degree of external search consumers utilize it (Chen & Gursoy, 2001; Engel et al., 1995; Gursoy & Umbreit, 2004). There is also a growing body of research examining the role of cultural differences in individual's use of computers and the Internet, online search behaviour and the perceived risk of using the Internet as a purchasing tool (Li & Kirkup, 2007; Park & Jun, 2003). Nevertheless, only a small number of studies have researched the impact of culture on tourists' external information search behaviour in cross-cultural settings (Gursoy & Umbreit, 2004; Marcos, Garcia-Gavilanes, Bataineh, & Pasarin, 2013).

Hofstede and Hofstede (2005) determined that cultural background contributes to the individual's tolerance levels of uncertainty and ambiguity, known as the uncertainty avoidance index. Such a cultural dimension shows that cultures with low uncertainty avoidance feel more comfortable in uncertain situations, while the opposite end, the cultures with a high uncertainty avoidance level, may feel anxious or threatened by such situations. Considering the fact the tourism activities can create situations with high levels of uncertainty for travellers, ranging from experiencing various cultures, languages, to reserving accommodations, travel activities without any prior experience, Kralisch, Eisend, and Berendt (2005) showed that when searching on the Internet, travellers from cultural backgrounds with high levels of uncertainty avoidance preferred to collect more information, and used search engines to a greater extent rather than the cultures with low uncertainty avoidance, which are more comfortable gathering less information during their online information search.

The report from Iresearch (2012) shows that Chinese travellers generally search for travel information on search engines which eventually directs them to social media sites (Xiang & Gretzel, 2010), vertical search engines, portal travel channels, OTAs. Before making the decision of travel, the potential tourists incline towards the search of the online travel reviews (Doong, Law, & Wang, 2009; Litvin, Goldsmith, & Pan, 2008), mostly for accommodation decisions. Chen, Johnson, and Gherissi-Labben (2013) showed that American tourists are inclined to use the Internet for querying travel information, as well as the reservation channel, while the German and French tourists illustrate a much higher conversion rate regarding Internet usage and online reservation. Moreover, Jordan, Norman & Vogt's exploratory study (2012) revealed that Belgians like to explore many options before deciding upon purchase, adopting a 'browsing' web style, while the Americans tend to use the 'one shop stop' search style, make multiple booking products on a single website. Zhou's study (2014) on Chinese students highlighted the actual gender differences when using the web for online information seeking, males being more engaged in search activities rather than females.

### 3 Methodology

This study examines the online travel information search behaviour of individuals from China and the United Kingdom, and the objectives of this study are to:

1. Examine how cultural background influences Chinese and British tourists, with regards to their online information search behavior
2. Identify cultural themes that should be included in promotional strategies aiming at the Chinese and the British tourist market

With a focus of understanding tourists behaviour and identifying possible explanations in terms of national likeliness and unlikeliness regarding the online information search, this study lays emphasis on the holistic ‘what, why, and how’ of human behaviour and therefore it adopts a qualitative methodology. The qualitative research helps in understanding the phenomenon more deeply by analysing the reasons behind it, it is pragmatic, interpretive and grounded in the lived experiences of people. The inductive approach of the study gives the researches a chance to explain the phenomenon studied, opening up new lines of enquiry without having any previous theories on the subject of interest. In order to understand the meaning people give to their use of the Internet in the process of travel information search, within their social setting, interviews were conducted to gain deep insights about people’s experiences, feelings and interpretation of the social world (Mack, Woodsong, MacQueen, Guest, & Namey, 2005).

China and the United Kingdom were selected as representations for the Asian and the Western cultures for comparison for two reasons. First, the vast difference between the scores on Hofstede’s (2001) depicted cultural maps provides a clear view of contrasting countries. According to these maps, while the United Kingdom rates relatively low in power distance, uncertainty avoidance dimensions, and long-term orientation, it rates high in masculinity and individualism dimensions. On the other hand, China rates high in power distance and long term orientation, and relatively low in individualism. Therefore, the study analyzes the manifestation of the specific cultural characteristics of English and Chinese culture in relation to their online information search behaviour. Secondly, Chinese students are required to learn English in primary schools (Wei and Su, 2012), ensuring that both interviewed groups were proficient in the English language. Bolton and Graddol (2012) quoted a China Daily article and stated that approximately a third of the mainland Chinese population is currently learning English, excluding Hong Kong and Macau, where English is an official language.

All the participating interviewees were asked for approval to be involved in the study, and certain rights including their anonymity was guaranteed. Considering the fact that the Generation Y, also known as the Millennials (ages between 18 and 30), are the technologically savvy, heavy Internet users (Nielsen, 2014), the two cultural representative groups were purposefully stratified according to their age, in order to obtain qualitative and meaningful answers from proficient Internet users. The convenience self-selected sample consisted of 20 native British travellers located

in the United Kingdom, and 20 native Chinese travellers located in their home country Interviews collected over a period of 3 weeks, starting from the 1st to the 22nd of March 2015. Due to the geographical area covered by the research, the interviews were conducted face to face, or through the medium of the mobile phone and computer, by using Skype. The open-ended questions used during the interview process were based on the recommendations from the existing literature, and the researcher's previous experience and knowledge developed while living in China, and in the United Kingdom. Moreover, as the respondents expressed their views, the researcher was able to ask further questions deviating from the interview protocol, revealing new factors relevant to the research.

## 4 Findings and Discussion

The results of the study indicate that there are differences between the British and Chinese online information behaviours, and that travellers are influenced to a certain extent by their cultural background. However, we, as humans, are simultaneously unique, and it becomes clear that culture only exists by comparison (Itim International, 2015a, 2015b, 2015c). The main themes and differences identified between the British and the Chinese travellers in terms of their online information search behaviour are going to be further discussed.

### 4.1 Information Sources

The main concept affecting the travellers' decision of using the Internet as an information tool or as a booking channel involves the user's attitude towards the Internet (Steinbauer & Werthner, 2007). Findings show that both British and Chinese travellers feel confident at utilizing the Internet hence they use it as an information tool, and as a booking channel for travel products. While previous studies showed that travellers first gather information from family and friends when choosing accommodation (Verma, Stock, & McCarthy, 2012), this particular study indicates that consumer behaviours have changed over time, and the Internet became a highly reliable and a primary source of information. Both the British and the Chinese travellers confirmed that the Internet search engines are the primary source of information. However, while British rely mostly on Google, Chinese mostly use Baidu. The later, also access Google (Krawczyk, 2015), although it is blocked in the country, because this generation of Millennials is highly influenced by the western culture, and they aspire to the freedom of information which they believe Google holds.

## **4.2 Attitude: Booker Versus Looker**

Although the Internet is the most important tool for information search for both cultural groups studied, travellers still purchase travel products offline due to psychological barriers (Buhalis & Law, 2008). As a country with higher levels of uncertainty avoidance, scoring 35 in Hofstede's dimensions (2001), compared to China which scores 30, travellers from the UK appear to feel more threatened by uncertain situations and therefore they try to avoid them. Results indicated that while Chinese travellers are very open at using the online booking systems, British travellers raise concerns related to potential technological issues, and they display less confidence, as well as safety concerns when providing personal information online. This justifies their inclination towards purchasing products off-line and asking help from third parties such as travel agencies. Comparatively, Chinese respondents confirmed to make travel bookings online directly through the Internet due to convenience. They perceive online sources as being cheaper compared to other sources such as travel agencies, hence the reason for using the Internet as a booking channel.

## **4.3 Usage Patterns**

When purchasing tourism products online, British travellers tend to start from the search engine Google, and then access various websites from the results pages in order to find the best deal available online. This suggests that the British travellers' search process is generally price-driven. On the contrary, the Chinese travellers generally access travel websites, based on popularity within the country, with Ctrip, Elong and Qunar being mostly mentioned as websites with good reputation, and offering value for money. It was suggested that Chinese travellers are driven by brand recognition and they base their decisions on Confucian ideology, and long-term orientation, as implied by Hofstede's (2001) dimensions. As a society which likes to maintain traditions and norms, it is reflected in the Chinese travellers' behaviours, where they all follow the same patterns of the general population within the country.

The frequency of searching for travel information and making travel purchases online is related directly to the travellers' frequency of traveling, which differs between the two cultures. The most recent dimensions added to the other six in Hofstede's (2011) theory is the indulgence versus restraint, and it is used to describe societies from the level of allowance to human desires related to enjoying life and having fun. According to Hofstede, Hofstede, and Minkov (2010), with a high score of 69, the British culture is classified as indulgent, while China's low score of 24 suggests that it is a restraint society, regulated by social norms. The findings of this research confirmed that in terms of the frequency of travelling and frequency of buying tourism products, the British respondents travel for leisure up to 5 times per

year, while the Chinese travellers take two holidays per year, during the most important Chinese holidays, which are the National Day and the Spring Festival. As an indulgent culture, the British travellers' responses confirmed that they generally possess a positive attitude, and they exhibit their desires and impulses concerning life enjoyment, as they place a much higher degree of importance on leisure time. On the contrary, the Chinese restraint society is also reflected in their frequency of leisure travel, and the control on gratification of their desires. According to Hofstede's Centre, China is a country where people believe that indulging themselves is somewhat wrong (Itim International, 2015a, 2015b, 2015c), and therefore they do not put an emphasis on leisure time.

#### ***4.4 Travel Planning***

Chinese travellers do not plan their holiday around the hotel, as opposed to the British ones. They plan their travel around the destination, and therefore their goals when searching for information on the Internet differ. While the British travellers look for a balance between price, location and comfort, the Chinese are mostly interested in getting value for money, and other aspects involving high value content about the destination. Chinese travellers generally want to experience, visiting places completely different from their home environments, and therefore the information which interest them is related to visa requirements, traffic in the area, less crowds, season, and local tourism services. The study confirms that the 'new' Chinese tourist is more independent, they do not look for package holidays, as they want to 'DIY' their trip. In accordance with Hofstede's dimensions (2001), China's relative low score in uncertainty avoidance is also reflected in the way they respond to travel information search behaviour. As this study suggests, Chinese travellers' planning is not detail oriented, and they are happy to change plans as they go along and new information is coming to light. This reason might also explain why the planning required for the Chinese travellers is considerably much shorter than for the British ones (1 week to 1 month versus several months respectively). British travellers might book earlier in order to get better prices, and they also prefer holiday packages mostly due to convenience, comfort, and feeling of being more organized.

#### ***4.5 Social Media Engagement***

British respondents are all active on at least one social media platform such as Facebook, Twitter, Instagram, Youtube, LinkedIn, Google+, and they mostly use them for entertainment and communication purposes, and hardly ever consider them for travel related purposes. However, Chinese travellers read social media information, and follow various travel accounts which provide updates regarding

interesting destinations, and travelling journals. Another reason for having subscriptions to travel accounts is due to the offers they can get online. These findings suggest that the content, comments and the reviews on these popular social networks are decisive elements for both cultural groups, and it influence especially the Chinese travellers' choices, hence presence on social media is a powerful tool in attracting tourists.

Online reviews play an important part in the information search and decision making process for both cultural groups. As the literature suggested, convenience, quality, social reassurance and risk reduction are the main factors which motivate customers to look for online travel reviews (Kim, Mattila, & Baloglu, 2011). While the majority of the British travellers mentioned TripAdvisor as a main source for customer reviews, the preeminent answer of the Chinese travellers relates to using the same source as the website where they make the booking, with very few respondents mentioning MaFengWo, the most popular travel website in China, where people share their experiences. Furthermore, the literature supports the theme related to the contribution of users' opinions, where according to Hofstede's (2001) findings, the UK scores high in individualism (89), while China scores low (20), being seen as a highly collectivist society, in which people's self-image is defined in terms of "we". The Hofstede Centre confirms that in individualist societies such as the UK, people tend to look after themselves and their direct family only (Itim International, 2015a, 2015b, 2015c), while in collectivist societies, people belong to 'in groups'. This is reflected in the high contribution and engagement on social media, and as demonstrated in this study, in China, more than in the UK, social media is much more integrated into people's lives and peer reviews are highly trusted. Chinese travellers are much more likely to engage in cooperative behaviour and information sharing, and they use them as a reference before traveling. While anonymity does not impede to building trust, the Chinese respondents explained that "the reviews are true" and "they are the reflection of the sincere feelings from the visitors from the past". On the contrary, the British travellers trust the reviews to a certain extent only, they are usually useful and provide "a slight idea of the place", and "every review has to be taken with a pinch of salt not every one of them will be true", as the respondents stated.

## 5 Conclusion

This research has contributed to the growing body of literature, through the examination of travellers' online information search behaviour on individuals from China and United Kingdom, with an emphasis on their cultural background and the way it influences their behaviour. The study found that the culture differences do have an impact on the travellers' online behaviour and it influences their patterns and choices when searching for information on the Internet. However, part of these contributions are based on the existing literature, more particularly, the concepts of high and low context culture of Hall's (1976, 1990) studies, and



Hofstede's (1991, 2001, 2010) cultural dimensions. The study used these existing frameworks which include various dimensions of culture, and applied them in a different context, represented by the online community. This comparative research led to fresh insights and provided deeper understandings of certain issues when travellers search for information online. Apart from illuminating similarities and differences between the two cultural groups studied, Chinese and British, the study allowed new themes to develop. Topics such as the diversity of interests manifested by the Chinese and the British travellers when looking for travel products emerged from this study. While the British travellers generally look for a price-comfort balance, the Chinese travellers look for more complex information, and they are concerned with hotel's surroundings, visa requirements, and traffic in the area. The viability of holiday packages could also be further qualitatively discussed, and this study showed major differences between the two cultural groups. The Chinese generally avoid packages as they like to make changes when travelling. However, British travellers hold a different attitude, and a holiday package might make them feel more relaxed and organized.

## References

- Bieger, T., & Laesser, C. (2004). Information sources for travel decisions: Toward a source process model. *Journal of Travel Research*, 42(4), 357–371.
- Bolton, K., & Graddol, D. (2012). English in China today. *English Today*, 28(3), 3–9.
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet – the state of etourism research. *Tourism Management*, 29(4), 609–623.
- Buhalis, D., & Michopoulou, E. (2011). Information enabled tourism destination marketing: Addressing the accessibility market. *Current Issues in Tourism*, 14(2), 145–168.
- Chen, J. S., & Gursoy, D. (2001). An investigation of tourists' destination loyalty and preferences. *The International Journal of Contemporary Hospitality Management*, 13(2), 79–85.
- Chen, J., Johnson, C., & Gherissi-Labben, T. (2013). Cross-cultural examination of decision elements: Youth tourism in Switzerland. *Anatolia*, 24(2), 162–172.
- China Internet Network Information Center (CNNIC). (2014). *Statistical report on Internet Development in China* [Online]. Available at: <http://www1.cnnic.cn/IDR/ReportDownloads/201411/P0201411102574314897888.pdf>
- Cisco. (2014). *Cisco connected World Technology Report* [Online]. Available at: <http://www.cisco.com/c/en/us/solutions/enterprise/connected-world-technology-report/index.html>
- Crouch, D., & Desforges, L. (2003). The sensuous in the tourist encounter. *Tourist Studies*, 3(1), 5–22.
- Cyr, D., Head, M., Larios, H., & Pan, B. (2009). Exploring human images in website design: A multi-method approach. *MIS Quarterly*, 33(3), 539–566.
- Doong, H., Law, R., & Wang, H. (2009). An initial investigation of integrating innovation diffusion models for drawing first-time visitors. *Journal of Travel & Tourism Marketing*, 26(1), 19–29.
- Engel, J., Blackwell, R., & Miniard, P. (1995). *Consumer behaviour* (8th ed.). Fort Worth, TX: Dryden.
- Fesenmaier, D. R., Cook, S., Sheatsley, D., & Patkose, M. (2009). *Travellers' use of the Internet: 2009 Edition* (p. 70). Washington, DC: Travel Industry Association.

- Fodness, D., & Murray, B. (1999). A model of tourist information search behaviour. *Journal of Travel Research*, 37(2), 220–230.
- Gefen, D., & Heart, T. (2006). On the need to include national culture as a central issue in e-commerce trust beliefs. *Journal of Global Information Management*, 14(4), 1–30.
- Gretzel, U., Fesenmaier, D. R., & O’Leary, J. T. (2006). The transformation of consumer behaviour. In D. Buhalis & C. Costa (Eds.), *Tourism business frontiers: Consumers, products and industry* (pp. 9–18). Oxford: Elsevier.
- Gursoy, D. (2003). Prior product knowledge and its influence on the traveller’s information search behaviour. *Journal of Hospitality and Leisure Marketing*, 10(3/4), 113–131.
- Gursoy, D., & Chi, C. G. (2008). Travellers’ information search behaviour. In H. Oh & A. Pizam (Eds.), *Handbook of hospitality marketing management* (pp. 266–295). Oxford: Elsevier.
- Gursoy, D., & McCleary, K. W. (2004). An integrative model of tourist’s information search behaviour. *Annals of Tourism Research*, 31(2), 353–373.
- Gursoy, D., & Umbreit, W. T. (2004). Tourist information search behaviour: Cross-cultural comparison of European Union Member States. *International Journal of Hospitality Management*, 23(1), 55–70.
- Hall, R. M. (1976). *Beyond culture*. New York: Doubleday.
- Hall, R. M. (1990). *Understanding cultural difference*. Boston, MA: Intercultural Press.
- Hofstede, G. (1991). *Cultures and organizations*. New York: McGraw Hill.
- Hofstede, G. (2001). *Culture’s consequences: Comparing values, behaviours, institutions, and organizations across nations*. Thousand Oaks, CA: Sage Publications.
- Hofstede, G. (2010). The GLOBE debate: Back to relevance. *Journal of International Business Studies*, 41, 1339–1346.
- Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, 2(1) [Online]. doi:10.9707/2307-0919.1014 (Accessed 15 April 2015).
- Hofstede, G., & Hofstede, G. J. (2005). *Cultures and organizations: Software of the mind* (2nd ed.). New York, NY: McGraw-Hill.
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind: Intercultural cooperation and its importance for survival* (3rd ed.). New York: McGraw Hill.
- International Relations and Security Network (ISN). (2012). *China, corporations and Internet censorship* [Online]. Available at <http://www.isn.ethz.ch/Digital-Library/Articles/Special-Feature> (Accessed 11 March 2015).
- Internet World Stats. (2015). Available at: <http://www.internetworldstats.com/>
- Iresearch. (2012). *A research report on the Chinese online travellers’ behaviours in 2012*. [Online]. Available at <http://www.iresearch.com.cn/> (Accessed 17 January 2015).
- Itim International. (2015a). *National culture* [Online]. Available at <http://geert-hofstede.com/national-culture.html> (Accessed 15 March 2015).
- Itim International. (2015b). *What about China?* [Online]. Available at <http://geert-hofstede.com/china.html> (Accessed 20 April 2015).
- Itim International. (2015c). *What about the UK?* [Online]. Available at <http://geert-hofstede.com/united-kingdom.html> (Accessed 20 April 2015).
- Jordan, E. J., Norman, W. C., & Vogt, C. A. (2012). A cross-cultural comparison for online travel information search behaviours. *Tourism Management Perspectives*, 6(1), 15–22.
- Keegan, W., & Schlegelmilch, B. (2001). *Global marketing management* (6th ed.). Harlow: Pearson Education.
- Kim, E., Mattila, A. S., & Baloglu, S. (2011). Effects of gender and expertise on consumers’ motivation to read online hotel reviews. *Cornell Hospitality Quarterly*, 52(4), 399–406.
- Kralisch, A., Eisend, M., & Berendt, B. (2005). Impact of culture of Website navigation behaviour. In *Proceedings of the 11th International Conference on Human-Computer Interaction* (pp. 22–27), Las Vegas, July. Mahwah, NJ: Erlbaum.

- Krawczyk, K. (2015, July 3). Google is easily the most popular search engine, but have you heard who's in second? *Digital Trends* [Online]. Available at <http://www.digitaltrends.com/web/google-baidu-are-the-worlds-most-popular-search-engines/> (Accessed: 22 April 2015).
- Li, N., & Kirkup, G. (2007). Gender and cultural differences in Internet use: A study of China and the UK. *Computers in Education*, 48(2), 301–317.
- Litvin, S. W., Goldsmith, R. E., & Pan, B. (2008). Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*, 29(2), 458–468.
- Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., & Namey, E. (2005). *Qualitative research methods: A data collector's field guide*. Durham, NC: Family Health International.
- Marcos, M. C., Garcia-Gavilanes, R., Bataineh, E., & Pasarin, L. (2013). Cultural differences on seeking information: An eye tracking study [Online]. Available at [http://repositori.upf.edu/bitstream/handle/10230/20943/CHI\\_mcmarcos.pdf?sequence=1](http://repositori.upf.edu/bitstream/handle/10230/20943/CHI_mcmarcos.pdf?sequence=1) (Accessed 28 April 2015).
- Nielsen, J. (2014). Millennials: Much deeper than their Facebook pages [Online]. Available at <http://www.nielsen.com/us/en/insights/news/2014/millennials-much-deeper-than-their-facebook-pages.html> (Accessed 6 December 2014).
- Office for National Statistics (ONS). (2014). *Internet access – Households and individuals 2014* [Online]. Available at [http://www.ons.gov.uk/ons/dcp171778\\_373584.pdf](http://www.ons.gov.uk/ons/dcp171778_373584.pdf) (Accessed 5 March 2015).
- Okazaki, S., & Hirose, M. (2009). Does gender affect media choice in travel information search? On the use of mobile Internet. *Tourism Management*, 30(6), 794–804.
- Park, C., & Jun, J.-K. (2003). A cross-cultural comparison of Internet buying behaviour: Effects of Internet usage, perceived risks, and innovativeness. *International Marketing Review*, 20(5), 534–553.
- Peng, H., Xu, X., & Chen, W. (2013). Tourist behaviours in online booking: A new research agenda. *Communications in Information Science and Management Engineering*, 3(6), 280–285.
- SE1 Media Ltd. (2015). *Key trends in online customer behaviour: Experience driven content strategies* [Online]. Available at <http://thinkdigital.travel/opinion/key-trends-in-online-customer-behaviour-experience-driven-content-strategies/> (Accessed 25 January 2015).
- Sondergaard, M. (1990). Hofstede's consequences: A study of reviews, citations and replications. *Organization Studies*, 15(3), 447–456.
- Srite, M., Thatcher, J. B., & Galy, E. (2008). Does within-culture variation matter? An empirical study of computer usage. *Journal of Global Information Management*, 16(1), 1–25.
- Stamboulis, Y., & Skayannis, P. (2003). Innovation strategies and technology for experience-based tourism. *Tourism Management*, 24(1), 35–43.
- Steinbauer, A., & Werthner, H. (2007). Consumer behaviour in e-Tourism. In M. Sigala, L. Mich, & J. Murphy (Eds.), *Information and communication technologies in tourism 2007* (pp. 65–76). Vienna: Springer.
- Thakran, K., & Verma, R. (2013). The emergence of hybrid online distribution channels in travel, tourism and hospitality. *Cornell Hospitality Quarterly*, 54(3), 240–247.
- Topi, H., & Tucker, A. (Eds.). (2014). *Computing handbook: Information systems and information technology* (3rd ed.). Boca Raton, FL: Taylor & Francis.
- Verma, R., Stock, D., & McCarthy, L. (2012). Customer preferences for online, social media, and mobile innovations in the hospitality industry. *Cornell Hospitality Quarterly*, 53(2), 183–186.
- Vyncke, F., & Bregman, M. (2010). Are culturally congruent websites more effective? An overview of a decade of empirical evidence. *Journal of Electronic Commerce Research*, 11, 14–29.
- Wei, R., & Su, J. (2012). The statistics of English in China: An analysis of the best available data from government sources. *English Today*, 28(3), 10–14.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179–188.
- Zhou, M. (2014). Gender difference in web search perceptions and behaviour: Does it vary by task performance? *Computers & Education*, 78(1), 174–185.

# Value Co-creation and Co-destruction in Connected Tourist Experiences

Barbara Neuhofer

**Abstract** Information and communication technologies (ICTs) have become a key resource that has transformed travel and tourist experiences. Due to the increasing ubiquity and mobility of ICTs, they have become integral in creating connected experiences that interlink travel with everyday life. While recent studies have investigated value co-creation and the enhancement of experiences through ICTs, there is less knowledge about potential value co-destruction when ICTs come into place. This paper provides a first exploratory study to examine technology resource integration by looking at the dichotomous relationship of value co-creation and value co-destruction in connected tourist experiences. By adopting a qualitative in-depth methodology, this study has identified six dimensions, which highlight how value can be created and destroyed through connectedness. The paper contributes to service-dominant logic, resource integration and value creation discourses in a tourism and technology context, for which several theoretical and practical limitations are discussed.

**Keywords** Value co-creation • Value co-destruction • Tourist experience • ICTs • Connection

## 1 Introduction

Value co-creation has become a recognised concept in services and tourism marketing research and practice. Hand in hand with the increasing empowerment of consumers and the proliferation of ICTs, the service-dominant (S-D) logic emerged (Vargo & Lusch, 2004). It proclaimed co-creation as the next practice of experience and value creation (Prahalad & Ramaswamy, 2004) and has gained wider attention in tourism in recent years (Binkhorst & Den Dekker, 2009). ICTs have been portrayed as key tools to enable, facilitate and enhance tourist experiences and create added value in numerous ways (Tussyadiah & Fesenmaier, 2009; Wang, Xiang, & Fesenmaier, 2014a). In particular, social media and networking tools (Fotis, Buhalis, & Rossides, 2011; Sigala, 2012a; Xiang & Gretzel, 2010), mobile

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devices and smartphones (Wang, Xiang, & Fesenmaier, 2014b) have encouraged individuals to connect and engage, and in turn co-create their experiences with a plethora of actors on an unprecedented scale (Ramaswamy, 2011). These connected and socially-dense practices have led to richer, more personal and meaningful experiences (Gretzel & Jamal, 2009; Ramaswamy & Gouillart, 2008), offering consumers a new level of experiences, which have been coined as ‘technology enhanced tourist experiences’ by recent research (Neuhofer, Buhalis, & Ladkin, 2013).

In an attempt to accelerate the co-creation debate, several studies have conceptualised and explored experience and value co-creation in tourism in the digital context (Neuhofer, Buhalis, & Ladkin, 2012; Schmidt-Rauch & Schwabe, 2013; See-To & Ho, 2014). While these and further studies have primarily investigated how technology can be used as a resource to enhance experiences and create added value, little emphasis has been placed on understanding how technology could potentially ‘*co-destruct*’ the value in the tourist experience. By drawing upon the recent S-D logic perspectives (Akaka & Vargo, 2014), there is evidence that not all resources are value-adding but can be value-destroying, effectively leading to diminished experiences and value. The role of technology in the context of tourist experiences has not been scrutinised through the framework of value co-destruction to date. Based on this gap, this study adopts the S-D logic to explore technology resource integration in tourist experience through the dichotomous value co-creation and value co-destruction perspective. Specifically, it aims to understand how the use of technology allows for value to be co-created or co-destroyed in connected tourist experiences. This study shall expand S-D logic discourses in the tourism and IT domain and offer a more critical perspective on how tourist experiences are shaped when ICTs come into place. The paper is divided into four main sections. It first contextualises the idea that we live in an era of connectedness, before providing the theoretical foundations of resource integration, value co-creation and value co-destruction. Second, the methodological design by means of a qualitative enquiry is explained and third the findings are presented, revealing six dimensions of value co-creation and co-destruction. In the final section conclusions are drawn, proposing an agenda for further research and offering implications for tourism management and practice.

## 2 Theoretical Background

### 2.1 *An Era of Connectedness*

With the proliferation of ICTs, the potential for experiences and value to be co-created has “*exploded on an unprecedented scale everywhere in the value creation system*” (Ramaswamy, 2009b, p. 17). While tourism traditionally lagged behind in discussing co-creation in research and applying its principles in practice,

it is evident that co-creation has gained increasing recognition. Particularly in the field of technology, scholarship has highlighted the potential of ICTs to mediate experiences and enable opportunities for co-creation in a number of different ways (Tussyadiah & Fesenmaier, 2009; Wang, Park, & Fesenmaier, 2012). Tourists use social media and networking applications as central tools to connect and share experiences (Kim & Tussyadiah, 2013; Neuhofer et al., 2012), engage and co-create experiences with an array of actors, e.g. companies, at any time (McCabe, Sharples, & Foster, 2012; Sfandla & Björk, 2013; Sigala, 2012b). Mobile technologies are key tools to amplify these practices to gather information (Wang et al., 2012) and support experiences by involving these networks anywhere on the move (Kim & Tussyadiah, 2013).

As a result of society's accelerated and inherently mobile lifestyle (Gretzel & Jamal, 2009), technology has become a critical tool to connect, share and co-create with others, thereby interlinking travel and everyday life (Wang et al., 2014a). ICTs have transformed the nature of the tourist experience, allowing tourists to experience the physical travel environment, while staying connected in the online space and engage with physically distant environments at the same time (Neuhofer, Buhalis, & Ladkin, 2014). This has led to an 'era of constant connectedness', in which tourist experiences are no longer isolated events, but are at the intersection of travel, work and life. Numerous benefits unfold as tourists use ICTs to connect, share and create distinct value as experiences become extended and intensified. However, there appears to be less understanding of how value might be co-deconstructed by integrating ICTs in order to facilitate such 'connected experiences'. Based on the assumption that travel fulfils the purpose of the reversal of everyday life, escapism and disconnection from the mundane (Cohen, 1979), it is thus of significance to evaluate whether there exist diminishing effects of ICTs resource integration on tourist experiences. By adopting the constructs of value co-creation and value co-destruction as theoretical vehicles, this paper now turns to examine the 'flipside' of technology to understand how value might be destroyed as ICTs become integrated and used. For this purpose, resource integration, value co-creation and co-destruction are contextualised in tourism next.

## **2.2 Resource Integration**

At the core of the S-D logic is the notion of 'resource integration' (Vargo, Maglio, & Archpru-Akaka, 2008), suggesting that individual actors integrate two types of resources, operand and operant resources, to allow for experiences and value to emerge (Vargo & Lusch, 2004). In tourism, operand resources are usually tangible resources (e.g. materials, amenities and natural resources) that need action taken upon to create value, while operant resources are usually described as intangible resources (e.g. human skills and knowledge) that can be integrated to act upon another resource (Akaka & Vargo, 2014). While the resource debate has been extensive, the role of technology has only been scarcely explored to date (Akaka

& Vargo, 2014). The premise of the S-D logic postulates that resources per se do not carry any value, but value is only *co-created* by the tourist when specific resources (e.g. technology) are put into use. This means that value does not automatically exist within a given device or application, but unfolds when an individual integrates it in a specific need situation (e.g. real-time transport app, restaurant review). Assuming that the integration of ICTs is contextually shaped by the tourist's use behaviour, ICTs might induce a co-creation (enhancement) or co-destruction (diminishment) of experiences and value.

### 2.3 Value Co-creation

Co-creation has introduced a new practice for services marketing, innovation and experience creation (Vargo et al., 2008; Vargo & Lusch, 2004) that has re-shaped our understanding of how contemporary interactions, experiences and value are created and constructed (Ramaswamy, 2009a). This perspective has provided a new fundament for tourism studies to explain that tourists have become empowered actors, who (a) engage with other actors (e.g. tourism businesses, consumer communities, personal networks and wider stakeholders), (b) integrate their resources (e.g. information, platforms and devices) and (c) participate in the design and creation of their experiences (Ramaswamy, 2009a). Tourists plan their travel online, personalise their hotel stay, connect with locals to get destination insights and contribute to review platforms online. Co-creation postulates that companies merely facilitate 'experience environments' for tourists (the beneficiaries), who use their resources for unique value to be extracted. One factor that has particularly maximised value co-creation is technology. Technology is a game changer that has fostered co-creation everywhere along the value creation system (Neuhofer et al., 2012).

### 2.4 Value Co-destruction

Expanding on the foundational premise that resource integration and value creation are contextually driven, it can be argued that value creation might not always be positive, but could also be negative in instances. This argument has been increasingly promoted in recent S-D logic discourses, drawing attention to the novel concept of 'value co-destruction' (Chathoth, Altinay, Harrington, Okumus, & Chan, 2013; Plé & Chumpitaz Cáceres, 2010). While the majority of scholarship has focused on positive value co-creation, value co-destruction has been largely treated as an implicit construct (Lefebvre & Plé, 2011). Value co-destruction acknowledges that value might not be created but destroyed by the actors (e.g. the tourist) or the resources (e.g. technology) that are integrated in the process. As such, co-destruction might occur on a voluntary (intentional) or involuntary



(accidental) level, with resources leading to an overall diminishment of value (Plé & Chumpitaz Cáceres, 2010). Considering resource integration as phenomenological (Helkkula, Kelleher, & Pihlström, 2012), it is important to adopt a more critical perspective to understand ICTs as a resource. Although technology might be “*a resource at one level, the same technology could be considered as a resistance at a different level, or different context*” (Akaka & Vargo, 2014, p. 374).

With this premise in mind, this study enters new theoretical territory by empirically exploring ICTs resource integration in tourist experiences through a S-D logic-driven co-creation and co-destruction lens. Studies exploring potential drawbacks and challenges of ICTs use in the context of tourist experiences are scarce to date. Only Pearce and Gretzel (2012) studied positive and negative experiential outcomes in so-called ‘technology dead zones’. Paris, Berger, Rubin, and Casson (2015) examined technology induced tensions in disconnected and unplugged tourist experience and Neuhofer, Buhalis, and Ladkin (2015) investigated technological enablers and barriers of tourist experience creation. Building upon this emerging stream of research, tackling ideas surrounding disconnection, barriers and issues of technology, this study shall contribute to a resource-based view and generate answers as to how technology ‘adds value’ or ‘diminishes value’ in connected tourist experiences.

### 3 Methodology

A qualitative enquiry was employed in order to extract the subjective experience narratives from individuals to understand co-creation and co-destruction practices in experiences through ICTs. Qualitative in-depth interviews were conducted, guided by a semi-structured interview instrument and an iterative interview process that allowed adapting the instrument on a continuous basis. The findings presented in this paper, which are part of a larger study, were mainly driven by two research questions. These are: (a) how does the integration of ICTs enhance the tourist experience? and (b) how does the integration of ICTs diminish the tourist experience? By asking participants an array of questions pertaining to positive and negative effects of technology use, a balanced view could be gathered shedding light on value co-creation and co-destruction. The sampling procedure followed a purposive technique, due to the reason that participants needed to fulfil a specific set of prerequisites to participate in the study (Bryman, 2008).

Participants had to meet the following three criteria to be: (a) technology-savvy consumers (defined as owners of smartphones and daily users of smartphones 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 for in-depth narratives, a total of 15 interviews were conducted over a 2-month period, with consumers having been identified in the geographical proximity of the researcher in the UK. Beyond the sample criteria, the profile of the participants can be considered similar to those of ‘early adopters of



*technology*' (Rogers, 2003), in terms of early technology adoption and general use behaviour. To extract the narratives, interviews lasted between one hour and two hours and a half each, leading to an average length of one hour and 24 minutes.

All interviews were voice-recorded and manually transcribed verbatim by the researcher in order to allow for a rigorous coding and analysis process (Rubin & Rubin, 2004). A qualitative thematic analysis was performed, following the principles suggested by Miles and Huberman (1994). To ensure a rigid analysis, a detailed six-stage coding process was developed, consisting of inductive broad brush coding of initial codes, coding-on, distilling, sorting and meta-coding, refining codes and clustering, and developing final themes and dimensions of the study. For this process, the computer software QSR NVivo 10 was used to store, organise and manage the wealth of data, including 286 pages of written transcripts. While criteria, such as reliability and generalisability generally play a minor role in qualitative research (Creswell, 2003), this study applied researcher reflexivity, contextualisation, prolonged data engagement, thick description and triangulation. Table 1 presents the socio-demographic profile, which reflects a range of demographic factors, including a balance of gender, age, education levels and nationalities. This research does not make claims of generalisability to the population, but can be considered as transferable to broadly mirror the profile of early adopters in the wider population.

**Table 1** Socio-demographic sample profile

Nr.	Pseudonym	Gender	Nationality	Education	Age	Smartphone
1	Laura	Female	Dutch	A-Levels	20–29	Samsung
2	Jane	Female	German	Postgraduate	20–29	iPhone
3	Martha	Female	German	Undergraduate	20–29	iPod/iPhone
4	Veronica	Female	Chinese	Postgraduate	40–49	iPhone
5	Sam	Male	British	A-Levels	20–29	Samsung
6	Paul	Male	British	Postgraduate	60–69	iPhone
7	John	Male	Indonesian	Postgraduate	30–39	Blackberry
8	Sandra	Female	Greek	Postgraduate	20–39	HTC
9	Teresa	Female	Indonesian	Undergraduate	20–39	HTC
10	Andrew	Male	Pakistan	Postgraduate	30–39	Samsung
11	Dan	Male	Greek	Postgraduate	40–49	Blackberry
12	Aaron	Male	Italian	Postgraduate	30–39	iPhone
13	Steve	Male	Belarus	Postgraduate	30–39	Samsung
14	Rachel	Female	German	Postgraduate	20–29	Blackberry
15	Hanna	Female	Vietnamese	Postgraduate	30–39	iPhone

## 4 Results and Discussion

The findings of the qualitative study shed light on ICTs as an important resource of value co-creation and value co-destruction in connected tourist experiences. Through the detailed coding process a total of six dimensions, which are presented and discussed below.

### 4.1 *Value co-creation: Connection as a Means of Value Creation*

The first set of findings relate to the theme of ‘value co-creation’ and indicate how tourists integrate ICTs and *positive* value is co-created and extracted through connected tourist experiences. The identified themes include (1) social connectedness, (2) social sharing and co-living, (3) mental detachment and de-territorialisation.

#### (1) Social Connectedness

As first and dominant theme emerged, participants reported a sense of ‘social connectedness’ that is created through the integration and use of ICTs. Connectedness has been highlighted as a crucial part of participants’ tourist experiences to compensate the feeling of being physically distant from home. The narratives indicate that tourists connect through a variety of mobile devices, such as smartphones and tablets, to (a) maintain a link to their everyday lives and (b) be able to keep up their mundane routines. The narratives pointed to an interesting connection paradox. One the one hand, tourists want to fully immerse themselves into the experience at the destination, while at the same time, they seek to use ICTs to create connectedness with people and activities relating to home. Through this practice tourists extract added value as it permits them to remain in contact with their social network, not only for updates, but importantly to avoid feeling spatially and temporarily isolated from their ‘usual lives’. The most noteworthy value creation occurs as ICTs are integrated to create an interconnection between the three dimensions of the ‘tourist life’, ‘private life’ and ‘work life’. Many participants reported to use ICTs as a key resource to stay in touch with family, friends and also the work community, and enhance their experiences through this process. Overall, ICTs are perceived as a crucial resource to maintain personal bonds and the sense of closeness with friends and family, but also create a feeling of security of having ‘virtual companions’ in a connected experience.

In the past if you don't have the smart phone, you are stuck when you were travelling (...)  
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)

I think the whole experience gets more interactive and you include like your private life and your restaurant experience and in some cases even your work, it's all happening together. (Martha)

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)

## (2) Social Sharing and Co-living

'Social sharing and co-living' through ICTs emerged as the second theme leading to positive value co-creation for the tourist. Sharing of experiential impressions and moments through ICTs, in particular social media, has become an integral practice of the tourist experience (Munar & Jacobsen, 2014). The findings reveal that tourists have a desire to share their trips live, in the moment, with others. Depending on the intensity of the sharing practice, value is co-created as tourists get connected, share experiences with others and allow the network to go as far as 'co-live' travel by being connected online. The majority of participants vividly recalled instances in which sharing with the connected social network has occurred as part of enhancing the tourist experience on-site. By inspiring, influencing and recommending places worth visiting, participants noted to feel like having accomplished something positive for others. Tourists want to bring unique things to people's attention, show them meaningful insights and be informative for others trying to find nice places in the future. In increasing the intensity of being connected, the narratives indicated that technology is used as a resource to invite the network to become part of the experience itself. Beyond a simple sharing mechanism, this practice allows other actors in the social network to become virtual co-participants of the tourist's lived experience, resulting in a co-created value sensation of '*being there with you*'.

It makes me feel good, because I know that if they feel the same way about these kind of places, they will have a really nice experience themselves. (Rachel)

Just the feeling to have the other people participating in your journey even though they are not there but to share your experience with. (Jane)

## (3) Mental Detachment and De-territorialisation

In sharp contrast to the notion of living the tourist experience as a way to dissociate from everyday life (Cohen, 1979), the findings revealed a third dimension of value co-creation in connected experiences, which can be described as 'mental detachment' or 'de-territorialisation'. As tourists use their devices to connect to their networks, it was found that they often do so to 'switch to distant places'. Participants mentioned to seek social interactions online that allow them to move to a 'virtual territory', while temporarily and mentally disconnecting from their physical surroundings. A distinct number of participants highlighted the need and desire to 'take a break from the tourist experience' in the physical space and interact with distant actors (e.g. friends and family) online. Temporarily detaching from the surroundings and shifting to the online world has been described as a unique

practice facilitated by the integration of ICTs. This momentary ‘absence’ that is sought after particularly creates a mechanism to fill time during experiential downtimes and boredom and serves as a means of change to interact with people other than the physically present travel companions. Teresa exemplifies a past tourist experience, capturing such representative behaviour:

I think that happens plenty of times and you sit down in a café and you enjoy your meal and you have to wait for certain minutes until the food arrives, and when there is nothing on the table and we are exhausted to talk to one another then we just engage with our virtual friends. (Teresa)

Sometimes when we are really exhausted, they all have an Internet connection we just silence for a few minutes and everyone keeps updating their Facebook or Twitter and then we realise that we are still silent because we keep busy with our activities on the viral world. (Teresa)

## ***4.2 Value Co-destruction: Connection as a Means of Value Destruction***

The second part of the findings relates to ‘value co-destruction’ and reveals how value is diminished and destroyed when ICTs come into play. The analysis revealed three main themes, including (1) barrier to escapism from everyday life and relaxation, (2) interference of ‘living’ the experience and (3) pressure and addiction.

### **(1) Barrier to Escapism from Everyday Life and Relaxation**

The first theme highlighted that technology can diminish the value of the tourist experience as it provides an almost ‘inevitable’ connection and in turn creates a barrier that prevents tourists from escaping from their everyday lives. While the use of ICTs for connection might create distinct benefits and added value in some contextual situations, the majority of participants reported it is a potentially value-destructing feature. Participants highlighted that the integration of ICTs to use applications and connect to networks online can significantly decrease the sense of escapism and possibility of true relaxation. By remaining connected with the home environment, participants noted that they seem to lose the sense and purpose of travelling, being able to immerse in the destination and living the ‘tourist life’. In a similar vein, other participants highlighted that the extensive ICTs use renders it difficult to refresh, renew and recreate while being away.

I would say that social networks are more distraction because it keeps you away from actually being in the location and not enjoying the place and time you are spending there (...) Because when you are entering a social network you are always somewhere else in a virtual world and then you are not really in the destination anymore, I mean not with your thoughts. (Jane)

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, technology should just support you to enjoy, it doesn't mean that it should prevent you from enjoying. (Hanna)

## **(2) Interference of 'Living' the Tourist Experience**

In close line with the first dimension, a second distinct theme emerged, suggesting that value co-destruction occurs as ICTs can create an 'interference' of living and enjoying the 'real' tourist experience on-site. The majority of participants highlighted this theme when asked whether ICTs could diminish the experience in any way. The findings reveal that the use of ICTs can destroy value, as the engagement with technology dominates the activities that are associated with travel. For instance, participants recalled several past travel events, when they were focussed on 'taking pictures for later' rather than enjoying the experience in the 'now', or when they engaged in excessive posting and sharing practices, rather than seeing and living things happening in the immediate surroundings. In many cases, this has led to a reported diminishment of living the own experience, as priority has been given to showing and living the experience for 'the others'. The following quotes exemplify the perceived value co-destruction when tourists themselves use ICTs in a way that they keep them from enjoying their experiences.

If you bring the camera to the holiday and all the time you look everything through the camera, you photo everything, what is the point? (Hanna)

Well I think when you don't watch out that you lose the purpose of your actually relaxing experience or this leisure kind of thing. Because in the past it was like that when you left the house you weren't connected, you were in another place and your mind could go somewhere else and could relax for the rest of the day. But NOW that you are connected I think you have to find a good balance that you don't get too busy with these things. (Martha)

Somebody that would take an image, post it on Facebook or Instagram and then would have the map and the phone out all the time, and the iPad, and kind of, I think that I feel 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)

It was like we were shooting pictures in order to take home a bit of the destination and maybe, not experiencing the real destination once we were there. It is like we stored all this information, because then when I have time I can experience that. While tourism is about experiencing it NOW. (Aaron)

## **(3) Sense of Pressure and Addiction**

The third theme highlights ICTs as a value destroying resource in connected experiences, primarily by creating a perceived sense of 'pressure and addiction' during travel. The majority of participants reported that the mere availability of ICTs (e.g. Internet connection, devices, social media) does create a self-induced pressure to use technology during travel. While participants noted connectedness and sharing through ICTs as a positive form of value creation, many narratives indicated that tourists perceive their own behaviours as both distractive and

destructive to their experiences. In fact, participants confirmed that they frequently feel socially pressured and obliged to take pictures of their experiences, upload and post these. These sharing practices have however been reported as time-absorbing and forced, with one participant, saying that one becomes ‘*a slave of technology*’. The findings indicate that dominant technology integration can render ICTs far from being a value-generating resource. Quite the opposite, it was noted that the self-inflicted pressure of having to connect and share can potentially reduce value. The following quotes exemplify such value co-destruction.

I’ve a lot of friends, technology addicted, and they say that they are experiencing a destination, but ACTUALLY they are not. They are in their iPhones, they are not looking at the beauty of the landscape or the nice restaurant, or the company they have at the restaurant, so I think technology is extremely relevant but we are still in the REAL world (Aaron)

It sets me under pressure. Yeah (affirmative). Yes because you always feel that you are on stand-by to be connected to all the social network. (Jane)

A lot of people upload everything they see they upload on Facebook, but I don’t like that idea, this is becoming a slave, like everything—this is not necessary. (Hanna)

## 5 Conclusion and Recommendations

The emergence and proliferation of an increasing amount of ubiquitously integrated social and mobile technologies have led tourists to connect and co-create their travel experiences and value on an unprecedented scale. In adopting the S-D logic perspective, this study aimed to explore technology as a resource of value co-creation and co-destruction in connected tourist experiences. While the existing literature has provided evidence that technology facilitates the co-creation and enhancement of tourist experiences (Akaka & Vargo, 2014; Chathoth et al., 2013; Neuhofer et al., 2014), this paper has drawn attention to the *flipside* of technology. Six main dimensions were identified, ranging from the benefits of sharing, co-living and detachment to the value-diminishing potential of ICTs to create barriers to escapism, experience interference and pressure in experiential settings. This leads to conclude that ICTs are resources that do not possess value and cannot be defined ‘as good or bad’ technology for travel per se. Rather, it is through technology use and application that value is contextually created or destroyed by tourists as individual actors. These findings lead to critical theoretical and practical implications.

On a theoretical level, this study contributes to recent S-D logic discourses in services and tourism research, starting to conceptualise digital technology as an enabler for experience and value creation practices (Akaka & Vargo, 2014). While technology will continue to play a significant role in many contemporary travel and leisure experiences, this study has highlighted that technology can potentially destroy experiences in contextual tourist use behaviour and application. The above presented insights contribute in that they have (a) provided a starting point

for a more differentiated understanding of the role of technology in resource integration and (b) extended co-destruction discourses in the tourism domain. This study also calls for a sensitisation of technology resource-based discourses.

This is particularly critical for tourism practice. Technology does not automatically create value or is an all-experience-enhancing tool that generates value for all kinds of travel types, situations and experiences. Instead, technology needs to be considered as an operant resource (Akaka & Vargo, 2014) that needs to be contextually meaningful to provide consumers with tools to integrate and co-create their own value in context and use. On the one hand, ICTs have the potential to facilitate more socially dense, connected and life-integrated experiences, which can lead to so-called technology-enhanced tourist experiences and value extraction (Neuhofer et al., 2012). On the other hand, tourism organisations need to be aware that technology facilitation and technology-enabled experience environments can potentially become value-destructing when tourists seek to escape, relax and break free from technology and desire to live in the moment and want to fully immerse in the tourist experience on-site. While the findings indicate that technology use behaviour and consequential value diminishment is often self-inflicted by tourists, tourism, destinations and hospitality organisations could potentially explore the facilitation of ‘technology-free’, ‘disconnected spaces’ or ‘digital detox’ zones, which could limit value destruction and could provide tourists with a space to disconnect, lift perceived pressures and live the tourist experience without physical or social interferences. As a novel idea gaining accelerated attention, disconnection might be a worthwhile avenue to explore, as organisations could offer tourists distinct value propositions and resources (beyond technology) to co-create connected and disconnected experiences in the travel context. In this vein, further research is needed to strengthen our current understanding of value co-destruction in connected tourist experiences, and to go one step further to explore value co-creation in ‘disconnected tourist experiences’ in an era of constant connectedness.

## References

- Akaka, M. A., & Vargo, S. L. (2014). Technology as an operant resource in service (eco)systems. *Information Systems and e-Business Management*, 12(3), 367–384.
- Binkhorst, E., & Den Dekker, T. (2009). Agenda for co-creation tourism experience research. *Journal of Hospitality Marketing & Management*, 18(2/3), 311–327.
- Bryman, A. (2008). *Social research methods* (3rd ed.). New York: Oxford University Press.
- Chathoth, P., Altinay, L., Harrington, R. J., Okumus, F., & Chan, E. S. W. (2013). Co-production versus co-creation: A process based continuum in the hotel service context. *International Journal of Hospitality Management*, 32(1), 11–20.
- Cohen, E. (1979). A phenomenology of tourist experiences. *Sociology*, 13(2), 179–201.
- Creswell, J. W. (2003). *Research design: Quantitative, qualitative, and mixed methods approaches*. Thousand Oaks: Sage Publications.

- Fotis, J., Buhalis, D., & Rossides, N. (2011). Social media impact on holiday travel planning: The case of the Russian and the FSU markets. *International Journal of Online Marketing*, 1(4), 1–19.
- Gretzel, U., & Jamal, T. (2009). Conceptualizing the creative tourist class: Technology, mobility, and tourism experiences. *Tourism Analysis*, 14(4), 471–481.
- Helkkula, A., Kelleher, C., & Pihlström, M. (2012). Characterizing value as an experience. *Journal of Service Research*, 15(1), 59–75.
- Kim, J., & Tussyadiah, I. P. (2013). Social networking and social support in tourism experience: The moderating role of online self-presentation strategies. *Journal of Travel & Tourism Marketing*, 30(1), 78–92.
- Lefebvre, I., & Plé, L. (2011). Emergence of value co-destruction in B2B context. In E. Gummesson, C. Mele, & F. Polese (Eds.), *Service dominant logic, network & systems theory and service science: Integrating three perspectives for a new service agenda*. Napoli: Giannini.
- McCabe, S., Sharples, M., & Foster, C. (2012). Stakeholder engagement in the design of scenarios of technology-enhanced tourism services. *Tourism Management Perspectives*, 4, 36–44.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). London: Sage Publications.
- Munar, A. M., & Jacobsen, J. K. S. (2014). Motivations for sharing tourism experiences through social media. *Tourism Management*, 43, 46–54.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2012). Conceptualising technology enhanced destination experiences. *Journal of Destination Marketing & Management*, 1(1–2), 36–46.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2013). A typology of technology-enhanced tourism experiences. *International Journal of Tourism Research*. doi:10.1002/jtr.1958.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2014). Co-creation through technology: Dimensions of social connectedness. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 339–352). Vienna: Springer.
- Neuhofer, B., Buhalis, D., & Ladkin, A. (2015). Technology as a catalyst of change: Enablers and barriers of the tourist experience and their consequences. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 789–802). Vienna: Springer.
- Paris, C. M., Berger, E. A., Rubin, S., & Casson, M. (2015). Disconnected and unplugged: Experiences of technology induced anxieties and tensions while traveling. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 803–816). Vienna: Springer.
- Pearce, P. L., & Gretzel, U. (2012). Tourism in technology dead zones: Documenting experiential dimensions. *International Journal of Tourism Sciences*, 12(2), 1–20.
- Plé, L., & Chumpitaz Cáceres, R. (2010). Not always co-creation: Introducing interactional co-destruction of value in service-dominant logic. *Journal of Services Marketing*, 24(6), 430–437.
- Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5–14.
- Ramaswamy, V. (2009a). Co-creation of value: Towards an expanded paradigm of value creation. *Marketing Review St Gallen*, 26(6), 11–17.
- Ramaswamy, V. (2009b). Leading the transformation to co-creation of value. *Strategy & Leadership*, 37(2), 32–37.
- Ramaswamy, V. (2011). It's about human experiences... beyond, to co-creation. *Industrial Marketing Management*, 40(2), 195–196.
- Ramaswamy, V., & Gouillart, F. (2008). Co-creating strategy with experience co-creation. *Balanced Scorecard Report*, 10(4), 1–3.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: The Free Press.
- Rubin, H. J., & Rubin, I. S. (2004). *Qualitative interviewing the art of hearing data*. London: Sage Publications.



- Schmidt-Rauch, S., & Schwabe, G. (2013). Designing for mobile value co-creation: The case of travel counselling. *Electronic Markets*, 24(1), 5–17.
- See-To, E. W. K., & Ho, K. K. W. (2014). Value co-creation and purchase intention in social network sites: The role of electronic word-of-mouth and trust – A theoretical analysis. *Computers in Human Behavior*, 31, 182–189.
- Sfandla, C., & Björk, P. (2013). Tourism experience network: Co-creation of experiences in interactive processes. *International Journal of Tourism Research*, 15(5), 495–506.
- Sigala, M. (2012a). Social networks and customer involvement in new service development (NSD): The case of [www.mystarbucksidea.com](http://www.mystarbucksidea.com). *International Journal of Contemporary Hospitality Management*, 24(7), 966–990.
- Sigala, M. (2012b). Web 2.0 and customer involvement in new service development: A framework, cases and implications in tourism. In M. Sigala, E. Christou, & U. Gretzel (Eds.), *Social media in travel, tourism and hospitality: Theory, practice and cases* (pp. 25–38). Farnham: Ashgate Publishing.
- Tussyadiah, I. P., & Fesenmaier, D. R. (2009). Mediating the tourist experiences: Access to places via shared videos. *Annals of Tourism Research*, 36(1), 24–40.
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68, 1–17.
- Vargo, S. L., Maglio, P. P., & Archpru-Akaka, M. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26, 145–152.
- Wang, D., Park, S., & Fesenmaier, D. R. (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), 371–387.
- Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014a). Adapting to the mobile world: A model of smartphone use. *Annals of Tourism Research*, 48, 11–26.
- Wang, D., Xiang, Z., & Fesenmaier, D. R. (2014b). Smartphone use in everyday life and travel. *Journal of Travel Research*. doi:10.1177/0047287514535847.
- Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31(2), 179–188.