



Contents lists available at ScienceDirect

Journal of Destination Marketing & Management

journal homepage: www.elsevier.com/locate/jdmm

Research Paper

A study of e-commerce adoption by tourism websites in China

Kaijun Cao^{a,b}, Zhaoping Yang^{a,*}^a Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, Urumqi, Xinjiang 830011, China^b University of Chinese Academy of Sciences, Beijing 100049, China

ARTICLE INFO

Article history:

Received 10 September 2015

Received in revised form

15 December 2015

Accepted 8 January 2016

Keywords:

Website evaluation
E-commerce adoption
Tourism website
Content analysis
China

ABSTRACT

Planning and booking a trip online is now increasingly common for travelers. This study evaluated 258 Chinese tourism websites (CTWs) using a content analysis technique that assessed website performance in terms of e-commerce adoption. The current study aims to elucidate the status of e-commerce adoption among different types of websites. The analysis revealed significant differences in performance between the types of websites, and online travel agencies (OTAs) were found to perform better than other types of tourism websites. The results also revealed that CTWs are not using the Internet to its full potential, as most tourism websites focus on providing basic information services, especially the official tourism websites (OTWs). Suggestions are made concerning how to improve the performance of CTWs and potential avenues for future research are discussed.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

The rapid growth in the number of tourists using the Internet to seek information and to make online reservations provides clear evidence of the popularity of the Internet amongst tourists in China (Fernández-Cavia, Rovira, Díaz-Luque, & Cavaller, 2014; Law, Qi, & Buhalis, 2010). In 2013, there were 2.8 billion Internet users worldwide (Internet World Stats, 2013). In China, the number of Internet users has dramatically increased, growing from 2.25 million in 2000 to 0.62 billion in 2013 (Internet World Stats, 2013), representing the greatest number of users in Asia.

In 2010, China replaced Spain as the world's third most visited country, behind France and the United States (Bastida & Huan, 2014). The China National Tourism Administration (CNTA, 2013) reports that Chinese domestic tourism is a \$428.12 billion market, with the number of inbound tourists reaching 129 million. Chinese tourists' interest in travel is increasing, highlighting the huge potential of China's online travel industry.

Given the growth of the Internet and of the Chinese tourism market, electronic commerce has an important effect on how tourism products and services are sold (Pollock, 1995; Williams & Palmer, 1999). For the purposes of this paper, e-commerce is defined as the buying and selling of goods and services or the conduct of financial transactions over the Internet.

The Internet is moving into a new era of e-commerce and

communication (Chiou, Lin, & Perng, 2011; Kim, Kim, & Han, 2007). Tourism websites provide opportunities for tourism organizations to promote their products and communicate with tourists and potential tourists (Stepchenkova, Tang, Jang, Kirilenko, & Morrison, 2010). Simultaneously, these websites provide a major information resource for tourists before they arrive at their destination and during their travel (D'Ambra & Mistilis, 2005; Shi, 2006). These websites offer specific information on accessible restaurants, transportation, attractions, and hotels.

Website content has been identified as one of the main factors contributing to repeat visits (Rosen & Purinton, 2004). When choosing a destination, visitors get detailed information such as address, pictures, a map, facilities, reference rates and reviews. The content of tourism destination websites conveys images of the destination and creates a virtual experience for the consumer (Doolin, Burgess, & Cooper, 2002). Because of their role in providing information, tourism websites are becoming increasingly important as a destination marketing tool for tourism organizations (Lee, Cai, & O'Leary, 2006), and they are the most frequently visited online information source by travelers (Chiou, et al., 2011). Tourism websites not only serve as a key promotional vehicle but also as a major distribution channel for domestic and international tourism (Lee, et al., 2006). These websites provide tourism information, and access to products and services for tourists and potential tourists.

Tourism organizations need to consider whether the facilities and services they provide to facilitate e-commerce could be improved to attract more visitors. For example, the more that tourism websites provide a higher level of e-commerce adoption for communications and business transactions such as orders and

* Correspondence to: Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences, 818 South Beijing Road, Urumqi Xinjiang, China. Tel.: +0086 0991 7885472.

E-mail address: yzhaoping@yeah.net (Z. Yang).

payments, the more likelihood they are to turn a potential tourist into an actual tourist. However, there is currently little published information about e-commerce activities in the Chinese tourism industry. In this research, based on the work of Qi, Law, and Buhalis (2008), and building upon their classification, Chinese tourism websites (CTWs) of three types were selected for analysis, namely, attraction websites (AWs), official tourism websites (OTWs), and online travel agents (OTAs). These websites reflect the real situation in a destination with respect to e-commerce adoption among CTWs. The research objective is to discover which CTWs are using e-commerce and how it is utilized. This involved measuring the performance of e-commerce adoption in various tourism websites. The study asks two research questions.

Research Question 1. What is the state of e-commerce adoption among CTWs?

Research Question 2. How do the three types of tourism websites perform in terms of website features?

2. Study background

2.1. Tourism E-commerce adoption in china

E-commerce has impacted the sales of tourism products and services, often resulting in higher profitability (Chu, Leung, Hui, & Cheung, 2007; Palvia, 2009); further, e-commerce offers benefits such as around-the-clock availability, accessibility, speed of access, wider selection of goods and services, and international reach (Tech Target, 2005). Tourism suppliers and agencies offer products and services online and also offer the benefit of reducing service costs, providing more high-quality services and attracting customers (Lu, Lu, & Zhang, 2002). Tourism organizations in China have moved more and more business activities and services online (Lu & Lu, 2004).

According to the China Internet Network Information Center (CNNIC, 2014a), at the end of December 2014, China had 649 million internet users, with 222 million travelers who made online travel reservations. This is an increase of 22.7% compared to 2013, increasing the utilization rate from 29.3% to 34.2% of all Internet users. According to the CNNIC (2014b) report, online booking was more popular in 2014 than in previous years (see Fig. 1) with the purchase of train tickets (26.6%), air tickets (13.5%), hotels (13%), and travel packages (7.6%). However, the US reached an online utilization rate of 70% in 2012, China's online travel market thus possesses enormous market potential (CNNIC, 2012–2013).

According to a survey report of the China Tourism Academy (CTA, 2011), e-commerce associated with tourism continues with the provision of the traditional services of air tickets, hotels, and consulting business. Moreover, a new emerging trend includes booking tickets for attractions and travel group buying. The survey shows that the three most popular online services include booking airline tickets, booking hotels, and looking for tourism information, used by 61%, 45.4%, and 44.6% of respondents respectively

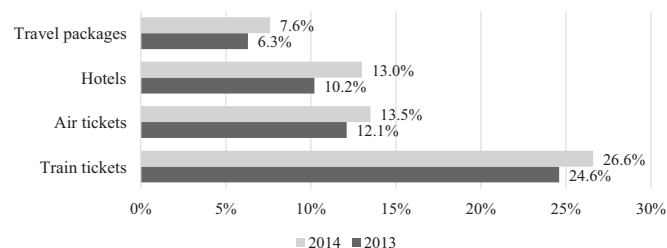


Fig. 1. 2013–2014 e-commerce utilization rates for various types of travel product in China (CNNIC, 2014b).

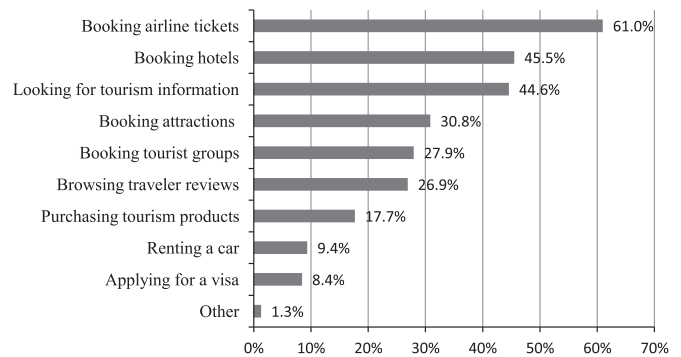


Fig. 2. Online leisure trip-planning activities (CTA, 2011).

(see Fig. 2).

Searching for information on tourism websites is important to tourists and potential tourists because it helps them to understand the destinations and supports their decision to travel. Fodness and Murray (1997) reported that visitors will use different types of information channels that can provide information to support their travel plans, thereby reducing the risk of making a purchase and improving the quality of tourism services, Tourists can thereby make more informed decisions by booking hotels before traveling, comparing prices to find the most cost effective tourism products, and reading reviews. CTWs originally provided a simple design and limited information services, but now more tourism organizations have started to invest in the development of websites and provide various online tourism services, with the result that more professional, comprehensive and high-quality tourism websites have emerged (Lu & Lu, 2004).

OTWs are important marketing tools for tourist destinations (Del Vasto-Terrientes, Fernández-Cavia, Huertas, Moreno, & Valls, 2015). They are funded by government and are monitored by provincial tourism administrations, such as the local official provincial tourism websites in Beijing, Shanghai, and Shandong. Although OTWs are not focused specifically on profit, they do increase visits to a destination and the sales of the related products (So & Morrison, 2004). The emergence of OTAs allows for a networked traditional travel agency sales model and for more interactive communication that is convenient for tourists. According to China Internet Network Information Center, (2014b) report on OTAs, sites such as Ctrip (ctrip.com), Quna (qunar.com) and Taobao travel (alitrip.com), have become popular options for online travel planning.

AWs are particularly important because the provision of computer-mediated information can increase tourists' awareness and interest, thereby increasing the likelihood of them visiting a specific attraction (Zhong, Leung, Law, Wu, & Shao, 2014). The highest official ranking accorded to Chinese tourist attractions is 5A, promising a high quality on-site experience. According to the Tourist Attraction Rating Categories of China (CNTA, 2007), 5A-level attractions must meet 12 criteria, such as transportation, sanitation, safety, tour availability, shopping, management, environmental quality, etc. AWs are funded by a scenic area management committee or tourism enterprises and, for example, the Jiuzhaigou, Mount Taishan and Mount Huangshan tourist attraction websites provide details of scenic spots along with online booking opportunities.

2.2. Website evaluation studies

A variety of different website evaluation methods and tools have been introduced in recent years. Chiou et al. (2011) reviewed the most common approaches, including content analysis, benchmarking, survey, experiment, case study, and automatic

Table 1
Description of research methodologies.

Methodology	Description
Content analysis	Content analysis is a research technique used in understanding the design and functions of websites (McMillan, 2000; Kladou & Mavragani, 2015).
Benchmarking	Benchmarking is as a continuous systematic process for evaluation of organizational performance in order to assist in developing organizational strategies (Stepchenkova et al., 2010).
Survey	Surveys may be conducted through e-mail or online questionnaires (Chiou, Lin, & Perng, 2010).
Experiment	An experimental evaluation is generally conducted in controlled settings. The participant is asked to accomplish a specific task by following a detailed set of instructions. Data are collected using interaction logs and protocol analysis (Chiou et al., 2010; Henderson, Smith, Podd, & Varela-Alvarez, 1995).
Automatic evaluation	A software tool is used to capture the characteristics of a web information system through a set of operational criteria or metrics for classifying the website or measuring its accessibility (Bell & Tang, 1998).
Counting	In the counting method, a researcher counts the number of features on a website against a checklist (Salavati & Hashim, 2015).
User judgment	User judgment methods are adopted to evaluate user satisfactions or perceptions, and measure different aspects and levels of user satisfaction (Law et al., 2010).
Numerical computation	This method uses mathematical functions to compute the performance of the tourism website based on a number of aspects. Performance is usually represented using a set of numeric scores (Law et al., 2010).
Combined method	This method uses different combinations of website evaluation methods (Law et al., 2010). For example, a combination of user judgment with automated methods.

evaluation (Table 1). Law et al. (2010) reviewed 75 papers, 27 of which adopted content analysis and 10 that used benchmarking. These papers can generally be divided into five evaluation approaches, namely: counting, user judgment, automatic evaluation, numerical computation, and the combined method (Table 1). Thus, content analysis is one of the major research techniques used in understanding the design and performance of websites (McMillan, 2000; Luna-Nevarez & Hyman, 2012; Marine-Roig & Anton Clavé, 2015; Rodríguez-Molina, Frías-Jamilena, & Castañeda-García, 2015).

Baloglu and Pekcan (2006) identified 33 site design characteristics and 12 website marketing practices, such as ease of navigation, online survey, flash animation, and a map. These are used as indicators of effectiveness on upscale and luxury hotel websites. Doolin et al. (2002) used interactivity as the primary method for establishing the various stages of e-commerce adoption and to measure the relative maturity of tourism websites. Researchers have investigated a variety of elements, such as website content (Roney & Özturan, 2006), performance of a certain website through specific features (Bastida & Huan, 2014; Derong, Zongqing, & Xiaolin, 2009), comparison of effectiveness of each of the items in a list of functions (Li & Wang, 2010, 2011), usability (Qi et al., 2008), and quality (Cebi, 2013; Ye, Fu, & Law, 2016).

Other authors have carried out detailed studies of the characteristics that a website should contain. Qi et al. (2008) categorized 30 website features into five dimensions: language, website layout, information architecture, user interface and navigation, and general attributes. Feng, Morrison, and Ismail (2004) concluded that marketing strategies, marketing information, web page design, and technical quality are key dimensions for destination management organization websites (DMOs). Miranda González and Bañegil Palacios (2004) identified that websites should be accessible, load quickly, be easy to navigate, and contain rich content.

Numerous studies have focused on E-commerce and have adopted different transaction processes as part of the framework for evaluating E-commerce activities and functionalities (Chiou et al., 2010). Hernández, Jiménez and Martín (2009) analyzed the main factors that must be taken into account in a commercial website. Li and Buhalis (2006) established segmentation information and identified influential factors in E-shopping adoption by Internet travelers. Zhao, Liu, Bi and Law (2014) determined customer satisfaction and repurchase intention in online tourism service recovery using an E-commerce website and a consumer and traveler survey. In order to evaluate the quality, usability, effectiveness and performance of tourism websites, other scholars

have conducted website studies that required survey participation from managers, researchers and experts (Chiou, et al., 2011; Law, Qi, & Leung, 2008; Horng & Tsai, 2010; Dickinger & Stangl, 2013; Zhong, et al., 2014). Various assessment techniques have been employed to evaluate websites using subjective approaches based on individual preferences (Chiou, et al., 2010; Ip, Law, & Lee, 2011; Law et al., 2010), and there is no universally accepted method, dimension or feature for website evaluation. This study adds to the literature by exploring the content of tourism websites, analyzing e-commerce adoption in Chinese online travel.

3. Methodology

Content analysis was conducted to better understand the website performance of e-commerce adoption in CTWs. A counting method was used due to its simplicity in collecting data and minimizing error, and ease of analysis, and it is the most popular website evaluation method (Salavati & Hashim, 2015). Counting was used to evaluate a website's performance and to determine its content richness (Law et al., 2010). This method has two requirements. First, a well-prepared checklist is required to verify the existence of attributes on a website. Second, a group of people is needed to do the actual counting in a laboratory (Law et al., 2010). The researchers counted the number of features on a website against a checklist comprising 48 features of CTWs. These features were established by a review of literature.

3.1. Dimensions

Methods to evaluate tourism websites differ depending on the requirements and nature of the businesses (Salavati & Hashim, 2015). For the purpose of this study, six dimensions were developed initially from reviewing previous studies by Maswera, Dawson, and Edwards (2008), Li and Wang (2010), and Zhong et al. (2014), as well as a collection of expert opinions. The six dimensions selected for this study focus on business-to-consumer (B2C) applications of the Internet for various kinds of CTW. The contents of a B2C website play an important role in influencing the purchase decision process of many tourists (Ranganathan & Ganapathy, 2002). Therefore, effective B2C tourism websites should provide comprehensive information on products and services, allow for quick booking and payment, offer electronic means of interactivity to tourists, and provide decision aids to help in evaluating alternatives (Costello & Tuchen, 1998; Ranganathan & Ganapathy, 2002; Hernández et al., 2009). For the above reasons,

Table 2
Features of tourism websites.

Dimension (Features)	AWs (%)	OTWS (%)	OTAs (%)	CTWs (%)
Product information				
Description of product and services	100	100	100	100
Rates/fares	79	68	90	81
Photo gallery	98	100	96	97
Virtual tours	56	35	0	38
Interactivity-winning	16	58	74	37
Privacy and security	19	45	48	31
FAQs	37	55	85	53
Non-product information				
Weather/climate	60	65	19	49
Travel directions	63	32	44	54
Local transport information	59	58	22	48
Where to stay	62	71	44	58
Safety	20	29	52	30
News	95	100	49	83
Travel tips	43	71	62	52
Contact details	66	64	84	70
Multiple languages	68	74	18	55
Visa information	0	10	42	13
Reservations				
Checking availability	58	42	90	65
Making online reservations	73	55	90	75
Tracking reservations	31	42	70	43
Canceling reservations	28	23	42	31
Cancellation policy	26	26	49	33
Amending reservations	25	23	34	27
Creating customer accounts	53	52	100	65
Payment				
Credit cards	38	32	82	50
Debit cards	49	32	71	53
Electronic cash	47	32	62	49
Virtual credit cards	0	0	0	0
Currency converter	1	0	7	3
Functionality				
Reciprocal links	77	97	86	82
Blog/WeChat	69	97	86	77
Search function	54	90	92	69
Site map	32	39	59	40
Maps	77	71	71	74
Games	2	0	1	2
Shopping carts	23	13	15	19
Free downloads	29	55	20	29
Customer relationship management (CRM)				
Community/forum	30	29	37	32
E-mail address	40	52	66	48
Feedback	39	10	47	17
Promotions and special offers	21	65	70	40
Email newsletter	8	16	19	12
Call-back services	3	0	5	3
Customer surveys	26	45	1	21
Comment box	44	52	75	53
Travel customization	2	13	22	9
Online consulting	45	19	59	46
Complaint handling	39	84	30	42

Sample size: Attraction websites (AWs) – 154, official tourism websites (OTWs) – 31, and online travel agents (OTAs) – 73.

Columns represent percentages of AWs, OTWs, OTAs and CTWs respectively.

websites performance was classified on the following six dimensions: product information, non-product information (such as weather information, travel directions, and local transport information), reservations, payment, functionality, and customer relationship management (CRM), and each contains multiple features. Subsequently, an expert panel, based on careful observations of CTWs, revised the list of features to make them more relevant to the Chinese context. The expert panel was composed of two Chinese professors who have been studying tourism websites for many years and six graduate students who were from a prestigious tourism program in the north-west of China. The features

employed embrace a variety of information, services, and functions, such as description of product and services, FAQs, travel directions, and reciprocal links. The review resulted in the identification of 48 features for the analysis of e-commerce adoption on Chinese tourism websites. The complete set of features is given in Table 2.

A brief description of the six dimensions follows:

- Product information.* Comprehensive attributes of the information provided regarding services, help, safety, and lodging options.
- Non-product information.* The informational content present on the websites in terms of both variety and suitability to tourists' needs (Del Vasto-Terrientes et al., 2015; Fernández-Cavia et al., 2014).
- Reservations.* Options involving online transactions, bookings, and services (Akincilar & Dagdeviren, 2014).
- Payment.* The payment method of choice.
- Functionality.* Accessibility of desired information on the website (Schmidt, Cantalops, & dos Santos, 2008), links to other tourism websites, and ability to execute the users' commands (Büyükközkcan & Çifçi, 2012)
- CRM.* Through constant conversations with tourists, and capturing the tourist preferences and behavior on the website, managers can acquire more insights into the demands and preferences of tourists (Wang, Li, & Li, 2013) and provide adequate means to retain customer loyalty (Maswera et al., 2008) and increase sales and opportunities to up-sell to tourists.

3.2. Website sampling and evaluation process

To evaluate E-commerce adoption in Chinese tourism web sites, the sample consisted of 31 provincial OTWs, 154 AWs, and 73 OTA websites. The 31 OTWs correspond to China's provinces, autonomous districts and municipalities (such as Beijing, Tianjin, Shanghai, and Chongqing). Among the 175 5A-level attractions in China, 154 (90.3% of the total) have established their AWs, all of which were selected for evaluation. Of the 81 online OTAs selected from a list at cnn.com, 73 links were valid. Thus, a total of 258 tourism websites were included in this study.

All the tourism websites were analyzed during May 2015. Each website was examined in detail and the various functions performed by the site were noted on a spreadsheet. Each website was examined using Google Chrome and matched against this spreadsheet. The content analysis was conducted by one person to ensure consistency, with a second person acting as an observer and controller of the coding and entry processes. A '1' was recorded if a tourism website provided information related to one of the content items and a '0' if not. Data analysis was conducted using SPSS 20. Multivariate analysis of variance (MANOVA) was utilized to understand the variations in the number of features used in each category by tourism website type. To complete the calculation, accumulated scores for each category were calculated by adding the 'Yes' (i.e. '1') responses in each category.

4. Results

4.1. Overall descriptive statistics

The descriptive statistics showed that the only content provided by all of the tourism websites was a description of the product and services. The numerical frequency of the given features, regardless of the website type, showed that over 80% of the tourism websites performed well in photo gallery, news, reciprocal

links, and rates/fares, largely for the benefit of potential visitors. More than 70% of tourism websites offered a blog/WeChat (which is more popular in China than other parts of the world), maps, and contact details. In contrast, approximately 70% of tourism websites performed poorly in terms of forums, cancellation policy, cancellation of reservations, amending reservations, privacy and security, safety, and free downloads (such as travel guides, travel contract and maps). Less than 10% of the tourism websites provided travel customization, call-back services, a currency converter, games, and virtual credit cards.

In addition, nearly 75% of tourism websites provided online booking opportunities, but this was functional in only 65% of the websites. Over 55% of websites provided at least two language options, which demonstrates the international scope of the market and underlines the need for tourist destinations to communicate with multiple target markets. However, from an e-commerce standpoint, most tourism websites focus on basic information services, and they are not utilizing the Internet to its full potential. Given the increasing adoption of e-commerce in China, CTWs should take advantage of the Internet's full potential features for reservations, payment, and functionality.

4.2. Differences among website types

Table 2 shows an analysis of the features found on 258 attraction websites (AWs, OTWs, and OTAs. As shown in Table 2, the most popular feature for all types of websites was a description of the offered products and services, which was present on all websites. Among different types of websites, the most frequently used features in the AWs involved maps, travel directions, local transport information, and virtual tours. The most distinguishing features of the OTWs included a photo gallery, news, weather, multiple languages, blog/WeChat, reciprocal links, and complaint handling. On the other hand, for the OTAs, the most common distinctive features included creating customer accounts, a search function, rates, checking availability, tracking reservations, and credit cards.

As shown above, there are significant differences according to website types. The most popular features of AWs are transport information and a virtual experience because they directly influence the perception of the destination. OTWs focused on providing information, promotion and regulations because they are monitored by local tourism administrations, and their responsibility is to promote the destination brand and act as a portal for visitor access to tourism operators and service providers. OTAs are the most closely associated with E-commerce, with at least four-fifths of the websites offering this feature. This is unsurprising given that OTAs are tourism enterprises whose mission is to sell tourism products.

The average frequency of each dimension is shown in Table 3, along with MANOVA results with a *post hoc* analysis. The overall MANOVA tests of Pillai's Trace and Hotelling's Trace were significant (0.475 and 0.709, respectively; $p < 0.001$), which suggests that each dimension is significantly different across website types. The average frequency of use of the website features is very limited. For example, for the payment dimension (Table 3), the OTAs only used an average of 2.22 features out of five features in this dimension. In addition, with respect to CRM (11 features), the average frequency of use of the features was relatively low, regardless of the website type. The results show that two dimensions (product information and payment) are significantly different across the three types of tourism websites. Non-product information was similar for all. In terms of product information, the OTAs had 4.93 features present, followed by OTWs (4.61) and AWs (4.05). Similar to other dimensions studies, OTAs had more features in comparison to the AWs and OTWs: it therefore performed

Table 3
MANOVA analysis and the average frequency of each dimension for tourism websites.

Dimensions (No. of features)	AWs (n=154)	OTWs (n=31)	OTAs (n=73)	F-value	p-Value
Product information (7)	4.05 ^a	4.61 ^{a,b}	4.93 ^b	3.57	0.03 ^a
Non-product information (10)	5.37 ^a	5.74 ^a	4.36 ^b	0.61	0.547
Reservations (7)	2.93 ^a	2.61 ^a	4.75 ^b	2.95	0.054 ^b
Payment (5)	1.36 ^a	0.97 ^a	2.22 ^b	4.73	0.01 ^a
Functionality (8)	3.62 ^a	4.61 ^b	4.32 ^b	1.89	0.153
CRM (11)	2.60 ^a	3.84 ^b	4.32 ^b	1.97	0.142

Note: The values are arithmetic means, mean scores with different letters are significantly different.

^a $p < 0.05$

^b $p < 0.1$

better than the other types of tourism websites in terms of product information, reservations, payment, and CRM.

5. Discussion and conclusions

The findings indicate that Chinese tourism websites are not effectively utilizing the Internet to its full potential. Most tourism websites focus on the provision of basic information services, especially the OTWs that are funded by the government, and are a convenient tool used by travelers to learn about a destination. They provide product information, in order to attract more tourists to the destination, and further enhance customer satisfaction. The AWs in China mostly are established on behalf of a scenic area management committee or tourism enterprises. This may partially explain the lack of product information, reservation and payment options, and CRM features on their websites. As most online tourism booking is done through OTAs, there is inadequate investment in e-commerce adoption. In addition, applications of reservations, payment, and CRM dimensions were not well deployed by CTWs. With increasing competition, CTWs cannot only provide basic information; they should adopt further e-commerce features. Visitors would benefit if the websites provided such services to make shopping possible which, in turn, would facilitate tourism development at the destination.

From an examination of the results, the following recommendations are made:

- (1) AWs can make their websites more interesting by adding virtual tours, games and maps so that visitors can 'see' the scenic environment. AWs can help potential visitors to plan their travel and have fun, by reflecting the vividness of the destination. At the same time, AWs are playing an active role in helping tourists to design their own experiences. More effort should be made towards improvement of reservations and payment.
- (2) OTWs need to adopt e-commerce fully and to become international websites that can develop global markets. It is recommended that these websites add multiple languages, visa information, a currency converter, online reservations and availability so that visitors can easily understand the details and can complete transactions online through internet channels.
- (3) OTAs need to enhance CRM services, which is a very important component of e-commerce. It is suggested that websites add feedback, forums, call-back services, and customer surveys so that customers' problems can be resolved immediately and OTAs can better cater to customers' needs, wants and

preferences. OTAs can employ various Web2.0 technologies, such as blogging, web communities and social networking, through which website visitors can share other tourists' experiences, find reviews, and clarify any doubts regarding traveling to the destination.

In summary, a content analysis approach was used to evaluate the performance of three types of tourism websites, in order to allow researchers and managers to compare the features of tourism websites and help them to determine what aspects of their websites should be improved. Useful recommendations have been made for increasing the effectiveness of the three types of websites.

There are several limitations to this study. First, all the data in the survey were collected from a single person-visit to each website. Although each site was reviewed carefully in the presence of a second observer, there is inevitably a degree of subjectivity. The avoidance of subjectivity in defining and evaluating the features, which is a common attribute of previous assessments, is a major challenge in research that purports to assess the attributes of websites. Furthermore, due to dynamic nature of website design, the performance of websites is likely to evolve so that studies undertaken subsequently may show different results.

In addition, this study represents the overall situation for e-commerce adoption in CTWs. It would likely be of interest to readers to replicate the study elsewhere in order to better understand the current development of CTWs globally. To provide updates for researchers and managers, and a different perspective on websites, future research will be conducted using a survey to examine the customers' perspectives on information availability and e-commerce service requirements. The findings will be used to determine whether or not there is consistency between the current state of tourism websites and the requirements of the customer.

Acknowledgments

The authors would like to thank the National Science-Technology Support Plan for supporting this research financially under grants No. 2012BAH48F01 and No. 2012BAH48F02. This work was also partially supported by the Science and Technology Plan of Xinjiang Uygur Autonomous Region (No. 201312115).

References

Akincilar, A., & Dagdeviren, M. (2014). A hybrid multi-criteria decision making model to evaluate hotel websites. *International Journal of Hospitality Management*, 36, 263–271. <http://dx.doi.org/10.1016/j.ijhm.2013.10.002>.

Büyükközkın, G., & Çifçi, G. (2012). A combined fuzzy AHP and fuzzy TOPSIS based strategic analysis of electronic service quality in healthcare industry. *Expert Systems with Applications*, 39(3), 2341–2354. <http://dx.doi.org/10.1016/j.eswa.2011.08.061>.

Baloglu, S., & Pekcan, Y. A. (2006). The website design and Internet site marketing practices of upscale and luxury hotels in Turkey. *Tourism Management*, 27(1), 171–176. <http://dx.doi.org/10.1016/j.tourman.2004.07.003>.

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. <http://dx.doi.org/10.1016/j.jbusres.2012.10.008>.

Bell, H., & Tang, N. K. H. (1998). The effectiveness of commercial Internet Web sites: A user's perspective. *Internet research*, 8(3), 219–228. <http://dx.doi.org/10.1108/10662249810217768>.

Cebi, S. (2013). A quality evaluation model for the design quality of online shopping websites. *Electronic Commerce Research and Applications*, 12(2), 124–135. <http://dx.doi.org/10.1016/j.elelrap.2012.12.001>.

China Internet Network Information Center. (2012–2013). *China online travel booking industry development report*. Retrieved June 10, 2015, from <http://www.cnnic.net.cn/hlwfzyj/hlwxzbg/lxgb/201310/P020131022416024416760.pdf>.

China Internet Network Information Center (2014a). *China internet development*

statistics report. Retrieved June 10, 2015, from <http://www.cnnic.net.cn/hlwfzyj/hlwxzbg/201502/P020150203551802054676.pdf>.

China Internet Network Information Center (2014b). *China online travel booking market research report*. Retrieved September 2, 2015, from <http://www.cnnic.net.cn/hlwfzyj/hlwxzbg/201507/P020150715651604925304.pdf>.

China National Tourism Administration (2007). *Attraction rating categories of China (GB/T17775-2003)*. Retrieved November 2, 2015, from http://www.cnta.gov.cn/zw/gk/hybz/201506/t20150625_428118.shtml.

China National Tourism Administration (2013). *China tourism industry statistics bulletin 2013*. Retrieved June 14, 2015, from <http://www.cnta.gov.cn/html/2014-9/2014-9-24-%7B@hur%7d-47-90095.html>.

China Tourism Academy (2011). *China tourism e-commerce development report*. Retrieved June 14, 2015, from <http://www.cnta.gov.cn/html/2011-9/2011-9-14-23-1-76970.html>.

Chiou, W.-C., Lin, C.-C., & Perng, C. (2010). A strategic framework for website evaluation based on a review of the literature from 1995–2006. *Information Management*, 47(5–6), 282–290. <http://dx.doi.org/10.1016/j.im.2010.06.002>.

Chiou, W.-C., Lin, C.-C., & Perng, C. (2011). A strategic website evaluation of online travel agencies. *Tourism Management*, 32(6), 1463–1473. <http://dx.doi.org/10.1016/j.tourman.2010.12.007>.

Chu, S.-C., Leung, L. C., Hui, Y. V., & Cheung, W. (2007). Evolution of e-commerce Web sites: A conceptual framework and a longitudinal study. *Information Management*, 44(2), 154–164. <http://dx.doi.org/10.1016/j.im.2006.11.003>.

Costello, G. I., & Tuchen, J. H. (1998). A comparative study of business to consumer electronic commerce within the Australian insurance sector. *Journal of Information Technology*, 13(3), 153–167. <http://dx.doi.org/10.1080/026839698344800>.

D'Ambra, J., & Mistilis, N. (2005). Analysis of perceived quality of information resources and a priori web usage at the Sydney Visitor Information Centre. In: A. Frew (Ed.), *Information and Communication Technologies in Tourism, 2005*. Vienna: Springer.

Del Vasto-Terrientes, L., Fernández-Cavia, J., Huertas, A., Moreno, A., & Valls, A. (2015). Official tourist destination websites: Hierarchical analysis and assessment with ELECTRE-III-H. *Tourism Management Perspectives*, 15, 16–28. <http://dx.doi.org/10.1016/j.tmp.2015.03.004>.

Derong, L., Zongqing, Z., & Xiaolin, G. (2009). A study of the website performance of travel agencies based on the EMICA model. *Journal of Service Science and Management*, 3, 181–185. <http://dx.doi.org/10.4236/jssm.2009.23021>.

Dickinger, A., & Stangl, B. (2013). Website performance and behavioral consequences: A formative measurement approach. *Journal of Business Research*, 66(6), 771–777. <http://dx.doi.org/10.1016/j.jbusres.2011.09.017>.

Doolin, B., Burgess, L., & Cooper, J. (2002). Evaluating the use of the Web for tourism marketing: A case study from New Zealand. *Tourism Management*, 23(5), 557–561. [http://dx.doi.org/10.1016/S0261-5177\(02\)00014-6](http://dx.doi.org/10.1016/S0261-5177(02)00014-6).

Feng, R., Morrison, A. M., & Ismail, J. A. (2004). East versus West: A comparison of online destination marketing in China and the USA. *Journal of Vacation Marketing*, 10(1), 43–56. <http://dx.doi.org/10.1177/135676670301000105>.

Fernández-Cavia, J., Rovira, C., Díaz-Luque, P., & Cavaller, V. (2014). Web Quality Index (WQI) for official tourist destination websites: Proposal for an assessment system. *Tourism Management Perspectives*, 9, 5–13. <http://dx.doi.org/10.1016/j.tmp.2013.10.003>.

Fodness, D., & Murray, B. (1997). Tourist information search. *Annals of Tourism Research*, 24(3), 503–523. [http://dx.doi.org/10.1016/S0160-7383\(97\)00009-1](http://dx.doi.org/10.1016/S0160-7383(97)00009-1).

Henderson, R. D., Smith, M. C., Podd, J., & Varela-Alvarez, H. (1995). A comparison of the four prominent user-based methods for evaluating the usability of computer software. *Ergonomics*, 38(10), 2030–2044. <http://dx.doi.org/10.1080/00140139508925248>.

Hernández, B., Jiménez, J., & Martín, M. J. (2009). Key website factors in e-business strategy. *International Journal of Information Management*, 29(5), 362–371. <http://dx.doi.org/10.1016/j.ijinfomgt.2008.12.006>.

Horng, J.-S., & Tsai, C.-T. (2010). Government websites for promoting East Asian culinary tourism: A cross-national analysis. *Tourism Management*, 31(1), 74–85. <http://dx.doi.org/10.1016/j.tourman.2009.01.009>.

Internet World Stats. (2013). *Usage and population statistics: Top 20 countries with the highest number of the Internet users*. Retrieved May 26, 2015, from <http://www.internetworldstats.com/top20.htm>.

Ip, C., Law, R., & Lee, H. A. (2011). A review of website evaluation studies in the tourism and hospitality fields from 1996 to 2009. *International Journal of Tourism Research*, 13(3), 234–265. <http://dx.doi.org/10.1002/jtr.815>.

Kim, D. J., Kim, W. G., & Han, J. S. (2007). A perceptual mapping of online travel agencies and preference attributes. *Tourism Management*, 28(2), 591–603. <http://dx.doi.org/10.1016/j.tourman.2006.04.022>.

Kladou, S., & Mavragani, E. (2015). Assessing destination image: An online marketing approach and the case of TripAdvisor. *Journal of Destination Marketing Management*, 4(3), 187–193. <http://dx.doi.org/10.1016/j.jdmm.2015.04.003>.

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. <http://dx.doi.org/10.1016/j.tourman.2009.11.007>.

Law, R., Qi, S., & Leung, B. (2008). Perceptions of functionality and usability on travel websites: The case of Chinese travelers. *Asia Pacific Journal of Tourism Research*, 13(4), 435–445. <http://dx.doi.org/10.1080/10941660802420994>.

Lee, G., Cai, L. A., & O'Leary, J. T. (2006). WWW.Branding.States.US: An analysis of brand-building elements in the US state tourism websites. *Tourism Management*, 27(5), 815–828. <http://dx.doi.org/10.1016/j.tourman.2005.05.016>.

Li, L., & Buhalis, D. (2006). E-commerce in China: The case of travel. *International Journal of Information Management*, 26(2), 153–166. [Please cite this article as: Cao, K., & Yang, Z. A study of e-commerce adoption by tourism websites in China. *Journal of Destination Marketing & Management* \(2016\), <http://dx.doi.org/10.1016/j.jdmm.2016.01.005>](http://dx.doi.org/10.1016/j.</p>
</div>
<div data-bbox=)

- ijinfomgt.2005.11.007.
- 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. <http://dx.doi.org/10.1002/jtr.772>.
- Li, X., & Wang, Y. (2011). Measuring the effectiveness of US official state tourism websites. *Journal of Vacation Marketing*, 17(4), 287–302. <http://dx.doi.org/10.1177/1356766711423436>.
- Lu, J., & Lu, Z. (2004). Development, distribution and evaluation of online tourism services in China. *Electronic Commerce Research*, 4(3), 221–239. <http://dx.doi.org/10.1023/B:ELEC.0000027981.81945.2a>.
- Lu, Z., Lu, J., & Zhang, C. (2002). Website development and evaluation in the Chinese tourism industry. *Networks and Communication Studies*, 16, 191–208 Retrieved from <http://www.netcom-journal.com/volumes/articlesV163/Netcom191-208.pdf>.
- Luna-Nevarez, C., & Hyman, M. R. (2012). Common practices in destination website design. *Journal of Destination Marketing Management*, 1(1–2), 94–106. <http://dx.doi.org/10.1016/j.jdmm.2012.08.002>.
- Marine-Roig, E., & Anton Clavé, S. (2015). Tourism analytics with massive user-generated content: A case study of Barcelona. *Journal of Destination Marketing Management*, 4(3), 162–172. <http://dx.doi.org/10.1016/j.jdmm.2015.06.004>.
- Maswera, T., Dawson, R., & Edwards, J. (2008). E-commerce adoption of travel and tourism organisations in South Africa, Kenya, Zimbabwe and Uganda. *Telematics and Informatics*, 25(3), 187–200. <http://dx.doi.org/10.1016/j.tele.2006.11.001>.
- McMillan, S. J. (2000). The microscope and the moving target: The challenge of applying content analysis to the World Wide Web. *Journalism Mass Communication Quarterly*, 77(1), 80–98. <http://dx.doi.org/10.1177/107769900007700107>.
- Miranda González, F. J., & Bañegil Palacios, T. M. (2004). Quantitative evaluation of commercial web sites: An empirical study of Spanish firms. *International Journal of Information Management*, 24(4), 313–328. <http://dx.doi.org/10.1016/j.ijinfomgt.2004.04.009>.
- Palvia, P. (2009). The role of trust in e-commerce relational exchange: A unified model. *Information Management*, 46(4), 213–220. <http://dx.doi.org/10.1016/j.im.2009.02.003>.
- Pollock, A. (1995). The impact of information technology on destination marketing. *Travel Tourism Analyst*, 3, 66–83.
- Qi, S., Law, R., & Buhalis, D. (2008). Usability of Chinese destination management organization websites. *Journal of Travel Tourism Marketing*, 25(2), 182–198. <http://dx.doi.org/10.1080/10548400802402933>.
- Ranganathan, C., & Ganapathy, S. (2002). Key dimensions of business-to-consumer web sites. *Information Management*, 39(6), 457–465. [http://dx.doi.org/10.1016/S0378-7206\(01\)00112-4](http://dx.doi.org/10.1016/S0378-7206(01)00112-4).
- Rodríguez-Molina, M. A., Frías-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(0), 303–317. <http://dx.doi.org/10.1016/j.tourman.2014.10.001>.
- Roney, S. A., & Özturan, M. (2006). A content analysis of the web sites of Turkish travel agencies. *Anatolia*, 17(1), 43–54. <http://dx.doi.org/10.1080/13032917.2006.9687026>.
- Rosen, D. E., & Purinton, E. (2004). Website design: Viewing the web as a cognitive landscape. *Journal of Business Research*, 57(7), 787–794. [http://dx.doi.org/10.1016/S0148-2963\(02\)00353-3](http://dx.doi.org/10.1016/S0148-2963(02)00353-3).
- Salavati, S., & Hashim, N. H. (2015). Website adoption and performance by Iranian hotels. *Tourism Management*, 46, 367–374. <http://dx.doi.org/10.1016/j.tourman.2014.07.017>.
- Schmidt, S., Cantalops, A. S., & dos Santos, C. P. (2008). The characteristics of hotel websites and their implications for website effectiveness. *International Journal of Hospitality Management*, 27(4), 504–516. <http://dx.doi.org/10.1016/j.ijhm.2007.08.002>.
- Shi, Y. (2006). The accessibility of Queensland visitor information centres' websites. *Tourism Management*, 27(5), 829–841. <http://dx.doi.org/10.1016/j.tourman.2005.05.012>.
- So, S.-I. A., & Morrison, A. M. (2004). Internet marketing in tourism in Asia: An Evaluation of the performance of East Asian National Tourism Organization websites. *Journal of Hospitality Leisure Marketing*, 11(4), 93–118. http://dx.doi.org/10.1300/J150v11n04_07.
- Stepchenkova, S., Tang, L., Jang, S., Kirilenko, A. P., & Morrison, A. M. (2010). Benchmarking CVB website performance: Spatial and structural patterns. *Tourism Management*, 31(5), 611–620. <http://dx.doi.org/10.1016/j.tourman.2009.06.015>.
- Tech Target. (2005). *E-commerce (electronic commerce or EC) definition*. Retrieved November 2, 2015, from <http://searchcio.techtarget.com/definition/e-commerce>.
- Wang, D., Li, X., & Li, Y. (2013). China's 'smart tourism destination' initiative: A taste of the service-dominant logic. *Journal of Destination Marketing Management*, 2(2), 59–61. <http://dx.doi.org/10.1016/j.jdmm.2013.05.004>.
- Williams, A., & Palmer, A. (1999). Tourism destination brands and electronic commerce: Towards synergy? *Journal of Vacation Marketing*, 5(3), 263–275. <http://dx.doi.org/10.1016/j.jdmm.2013.05.004>.
- Ye, B. H., Fu, H., & Law, R. (2016). Use of impact-range performance and asymmetry analyses to improve OTA website quality. *Journal of Hospitality and Tourism Management*, 26, 9–17. <http://dx.doi.org/10.1016/j.jhtm.2015.09.001>.
- Zhao, X., Liu, Y., Bi, H., & Law, R. (2014). Influence of coupons on online travel reservation service recovery. *Journal of Hospitality and Tourism Management*, 21, 18–26. <http://dx.doi.org/10.1016/j.jhtm.2014.03.001>.
- Zhong, L., Leung, D., Law, R., Wu, B., & Shao, J. (2014). An application of the capability maturity model for evaluating attraction websites in mainland China. *International Journal of Tourism Research*, 16(5), 429–440. <http://dx.doi.org/10.1002/jtr.1937>.