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Abstract Title: Consumer Adoption of Tourism Electronic Commerce: A Framework for Empirical Research Based on Structural Equation Modeling

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1. Introduction

Tourism electronic commerce (TEC) is the application of Internet-based information technology (IT) in the context of tourism industry. Adoption of IT refers to the acceptance and usage of the technology by the organizations or individuals. IT adoption is the main process of IT diffusion and assimilation. Adoption of TEC includes two levels. One is at the organizational level which refers to transaction and service provision based on electronic commerce by the tourism companies and relative sectors. The other is at the individual level which refers to the acceptance of TEC service by consumers, mainly in the form of visit to the tourism websites and online purchase of tourism products (i.e., online reservation/booking). Consumer demand characteristics and behavior rules in the adoption of TEC are the foundation of marketing strategies made by the tourism organizations.

In tourism activities, the tourist flow takes the material flow instead, and the tourism websites take advantages of both information flow and capital flow, so TEC has become the largest retail electronic commerce in the world. TEC plays an increasingly important role in China, the most promising tourism market in the world. As of March 2010, China has had 50,500 tourism websites (Internet Weekly, 2010). In recent years, online travel agents (OTA) such as Ctrip(www.ctrip.com) and eLong(www.elong.com) have made remarkable achievements. E-commerce giants such as Taobao (www.taobao.com), Tencent (www.qq.com), and Baidu (www.baidu.com) also launched travel channels or travel platforms. Tourism review websites, group buying website, wireless travel sites highlight the development of TEC. All the airline tickets are sold online, and all the train tickets can be booked via the Internet. According to the latest statistics by China Internet Network Information Center (CNNIC, 2012), 92.7% of Chinese SMEs have accessed the Internet, and 43% of Chinese companies have independent Web sites or set up shops in e-commerce platforms. It can be seen that the adoption rate of e-commerce at the firms' level is relatively high. However, despite of the largest Internet population in the world, only 8.2% of the Internet users have adopted online travel booking (CNNIC, 2012). According to the statistics from Iresearch Group, the scale of China's online travel market, including telephone reservation after online information search and online booking, was 486.4, 656.6, 1037.4 billion RMB in 2008 to 2010, respectively, of which online travel booking market was 29.4, 38.9, 61.6 billion RMB, respectively(IResearch, 2011). About 90% of annual revenue of online travel booking comes from airline reservation and hotel booking (IResearch, 2011) . In 2009, the penetration rate of TEC in China accounted only for 5.1% in the tourism industry, whereas the rate was 70% in America, 50% in EU and 30% in India, respectively (IResearch, 2011).

It can be concluded that TEC has a great market potential in China, where the consumer adoption of TEC should be promoted by the tourism marketers and be scrutinized by the researchers. The remainder of this article will review the previous research and propose a framework for future investigation. Section 2 will show the methodology trends in TEC adoption research, the quantitatively empirical methods, and a structural equation modeling approach in particular. In Section 3, we will analyze the existing literature on consume adoption of TEC from five sub streams. Based on the research voids we find in Section 3, in Section 4, we will forward a framework for empirical research based on structural equation modeling, which incorporates the research domains in consumers' information searching before purchase, in their various buying behaviors, and in their online review contribution and re-purchase intention after purchase. Finally, the conclusion is provided in Section 5.

2. Empirical Methodology Trends in TEC Adoption Research

Web-based e-commerce began at the late 1990s, hence research on TEC is just at the early stage (Buhalis & Law, 2008), with the evidence that a large body of the early literature is conceptual, exploratory and qualitative research, discussing on the application status, mode, effects, problems and countermeasures of e-commerce in tourism(Ma et al., 2003). Empirical methods were gradually employed in the adoption of TEC in the latest decade. At the organizational level, Buhalis & Deimezi (2004) empirically examined the level of Information Communication Technology (ICT) diffusion in Greek small and medium-sized tourism enterprises through semi-structured interview and emailed questionnaires. Wang & Cheung (2004) proposed a multi-level model and tested it empirically using survey and interview data to explain e-business adoption by travel agencies in

Taiwan. Roney (2004) also conducted an exploratory survey research on the Internet adoption by the travel agencies in Turkey. Recently, Huang et al. (Huang, 2008; Fuchs et al., 2010; Hung et al., 2011) empirically studied the e-commerce adoption by tourism firms. Buhalis et al. (2008) comprehensively reviewed the studies in the context of Internet applications to tourism and summarized the research work into three categories, namely, consumer and demand dimensions, technological innovation, and industry and business functions. They then pointed out that future research on tourism electronic commerce will be focused on consumer-centric technologies that will support organizations to interact with their customers dynamically since consumers are much more sophisticated, experienced, increasingly able to determine elements of their tourism products, and much more difficult to please. From the perspective of the consumers, indeed, many researchers have conducted quantitative research empirically on TEC adoption, as mentioned in the next section. In mainland China, most literature on TEC are still conceptual and descriptive with the problem-countermeasure paradigm, without scientific research processes or innovative research methodologies for academic study. Consumer behavior in the TEC adoption, especially in the most booming market, is still an under-researched area that cries for additional attention.

Structural equation modeling (SEM) technique is an innovative approach for empirical research with statistical data. SEM integrates the statistical techniques of factor analysis, path analysis, correlation analysis and regression analysis to identify, evaluate, modify and validate the specified model, and estimate the parameters in the model. In a specified SEM model, the causal relationships among the latent variables are hypothesized and then statistical data, often from survey are input to test the hypotheses. Using this approach, the relationships among the independent variables, moderating variables, mediating variables and dependent variables are validated by

realistic data to explain the objective laws and provide insights for management. SEM has been widely used in a number of disciplines in management, such as IT adoption, consumer satisfaction, supply chain management and human resource management. SEM has been used in modeling travel behavior and values since about 1980, and its use is rapidly accelerating, partially due to the availability of improved software. Golob (2003) introduced the method with details and reviewed travel behavior research with the SEM method. SEM is sure to be a powerful approach to study the consumer adoption of TEC.

3. Related Work on Consumer Adoption of TEC

3.1 The impact of tourism websites on users' purchase/travel decision making

Before the tourism websites were widely used, potential tourists searched information from friends or relatives, highway welcome centers, automobile clubs, brochures from hotels or attractions, commercial guidebooks, magazines and newspapers, local tourist offices and travel agencies. Fodness & Murray (1999) suggested that nature of decision making, composition of traveling party, purpose of trip, mode of travel and social-economic status of a tourist are antecedents of the his information search strategies, while his information search strategies have significant impacts on his length of stay, number of destination visited, number of attractions visited, and the travel-related expenditures. Tourism websites have been a most powerful information source since the new century, with the evidence that the www.arkansas.com had successfully converted more than 60% of the site visitors into visitors to Arkansas in 7 months (McLemore & Mitchell, 2001). While travelers are increasingly turning to the Internet for information, many are still hesitant to book online because of the perceived lack of a secure

payment method, a lack of confidence in the technology and a need for a personal service and human interface (Lang, 2000). With the development of Internet, tourism websites are playing an important role in the promotion and marketing of destinations (Doolin et al., 2002). Most researchers assumed or argue that the more powerful the information functionality of the tourism website is, the more users will visit to the website, the more intention to visit the destination they have. Skadberg et al. (2004; 2005) empirically indicated that visitors' flow experience while browsing a tourism website will lead to changes of attitude and behavior, including inquiring for more information, coming back to the website, and visiting the destination. Exposure to the official tourism website can reduce the perceived risks toward the destination (Lepp et al., 2011). Interestingly, however, different opinions do exist. Luo et al., (2005) found that there is no difference in the destination perceptions among tourists who use the Internet vs. other information sources. Kao et al. (2005) demonstrated with empirical data that though the satisfaction toward a destination website is positively correlated to the intention to reuse and recommendation of the website to other users, the intention to actually visit the destination is un-correlated to the website satisfaction. Kaplanido & Vogt (2006) even verified that previous visit to the destination website has significant negative influence on intentions to travel to the destination. That is to say, in some cases, people tend to visit the virtual destination website instead of traveling to the actual destination. The contradictory results suggest a further research on the mechanism of how tourism websites exert influence on people's travel intention.

3.2 The impact of online tourism reviews on travel reservation/decision

Online tourism reviews are written voluntarily by tourism consumers in online communities, travel blogs or special review websites on their experiences, perceptions and evaluations about the

tourist destinations, companies or services. They are consumer-generated content (UGC) and a main representation of electronic word-of-mouth (WOM). Online tourism reviews reflect a firm's competitive position in producing satisfied guests (Crotts et al., 2009). Since tourism products are intangible and difficult to evaluate prior to the consumption, word-of-mouth is a dominant factor to influence travel decisions (Doong et al., 2009; Litvin et al., 2008). Online travel reviews are ever more available and used to inform travel-related decisions, particularly accommodation decisions rather than en route travel planning (Gretzel & Yoo, 2008). The impact of online user reviews on hotel sales is significant (Ye et al., 2009) and shows gender and age differences (Gretzel et al., 2008). Consumers seem to be more influenced by early negative information, especially when the overall set of reviews is negative. However, positively framed information together with numerical rating details increases both booking intentions and consumer trust (Sparks & Browning, 2011). The WOM communication processes includes motivations for contribution, source of WOM, mediating variables of the originators, mediating variables of the listeners and outcomes of WOM, each of which indicates further research in the context of hospitality and tourism industry (Litvin et al., 2008). While the prior research has mainly focused on the impact of online tourism reviews, little work has been done on the antecedents of the impact, i.e., motivations and influentials for contribution by the reviewers, and motivations and influentials for review searching and receiving by the receivers.

3.3 Factors that affect online travel reservation

In the generic information system and e-commerce adoption literature, many models and theories are well documented empirically such as the technology acceptance model (TAM)(Davis, 1989), the unified theory of acceptance and use of technology (UTAUT) model (Venkatesh et al.,

2003), theory of reasoned action (Fishbein & Ajzen, 1975), theory of planned behavior (Ajzen, 1991), innovation diffusion theory (Rogers, 1995), theory of task-technology fit (Zigurs & Buckland, 1998), theory of flow experience (Koufaris, 2002) and theory of web experience (Constantinides & Geurts, 2005). Online travel reservation is the consumer adoption of TEC to buy tourism products, which has much in common with online shopping, while the special nature of travel booking should not be neglected. Bogdanovych et al. (2006) investigated people's perception on the decision choice of booking their trip online or via traditional travel agencies. Factors are validated to affect online travel reservation by the empirical researcher including perceived risk (Kolsaker et al., 2004), security (Heung, 2003; Kim et al., 2006; Wong & Law, 2005), preference for offline service (Heung, 2003), convenience (Heung, 2003; Kim et al., 2006; Kolsaker et al., 2004), usefulness (Kim et al., 2009; Steinbauer & Werthner, 2007), information quality (Wong et al., 2005), time saving (Heung, 2003; Wong et al., 2005), consumer innovativeness or technological inclination (Card et al., 2003; Heung, 2003; Kim et al., 2006; Lee et al., 2007; Steinbauer et al., 2007), self-efficacy (Steinbauer et al., 2007), involvement (Card et al., 2003; Steinbauer et al., 2007), Internet experience (Card et al., 2003; Steinbauer et al., 2007), competitive price (Kim et al., 2006; Wong et al., 2005), service performance & reputation (Kim et al., 2006), subjective norms (Kim et al., 2009), trust (Kim et al., 2009; Steinbauer et al., 2007) and gender (Steinbauer et al., 2007). Li & Buhalis (2006) examined the features of Internet travelers in mainland China and found that age, area of residence, type of travel website most visited, length of time using the Internet, self-efficacy, domain-specific innovativeness and perception of the Internet are influential factors of Chinese lookers becoming bookers. According to the special nature of online booking, particularly in the context of the Chinese market, there is much room for further

research pertaining to the antecedents and moderators for online bookers from various perspectives.

3.4 Customer satisfaction and loyalty toward the tourism websites

It is substantiated that in marketing, customer satisfaction, which results from the disconfirmation of expectations and experiences (Oliver, 1980), will lead to customer loyalty and repurchase, which means profitability of the firm consequently (Hallowell, 1996). In the offline context, destination image, past trip experience and destination preference have a positive relationship with tourism destination loyalty (Alegre & Juaneda, 2006; Chen & Gursoy, 2001; Chi & Qu, 2008). Perceived value has also been identified as a key determinant of repurchase intention and loyalty of the golf travelers (Petrick & Backman, 2002). Travel satisfaction results in destination loyalty, representing recommendation and revisit (Yoon & Uysal, 2005). (Lu & Lu, 2004) identified by survey that Chinese tourism website users' satisfaction/dissatisfaction are mainly determined by the information function and search speed of the website. Bai et al. (2008) verified that the functionality and usability of websites positively affects the users' satisfaction toward the websites. Kao et al. (2005) studied the antecedents and outcomes of the tourists' website satisfaction and found that information quality and system quality contribute to the website satisfaction and the website satisfaction leads to the intention to reuse and recommendation of the website to other users. All of these studies focus on the consumer satisfaction toward the information of the websites, while the consumer satisfaction toward online booking and the intention to repurchase/ re-booking remains unrevealed.

3.5 Consumer adoption of mobile travel reservation

Mobile Internet adoption in travel information search though competes with PC Internet,

benefits much from the PC Internet on the theoretical and practical basis (Okazaki & Hirose, 2009). Besides perceived usefulness and perceived ease of use in the robust TAM model, using an SEM method, technology experience and trip experience are empirically validated by Kim et al. (2008) to be the external variables that influence the travelers' acceptance of mobile technology. Perceived financial resources and perceived compatibility are also predictors of travelers' behavioral intention to use mobile booking (Wang & Liao, 2008). Eriksson & Strandvik (2009) conducted a field trial to explore factors affecting the adoption of mobile tourism services and identified that the major determinants are the value aspect of the packaged tour, price transparency and ease of use. Mobile commerce is ubiquitous, and the tourists are "mobile" in the trip, so the consumers' demand for the adoption of mobile travel booking warrants further scrutiny.

4. Future Research Framework for Consumer Adoption of TEC Based on SEM

The literature analysis above indicates that many contributions are achieved with normative research methodologies while the research voids still remain to be filled in the consumer adoption of TEC. Additionally, several empirical studies draw equivocal conclusions for a lack of generalization of the sample, for only descriptive statistics is used to show the external features ignoring the inherent laws, and for the regression analysis reveals what but how factors exert the influence to the consumer adoption behavior. For further investigation into the antecedents and consequences of consumer adoption of TEC, we propose a research framework based on the SEM approach incorporating the three stages of TEC adoption (See Fig. 1).

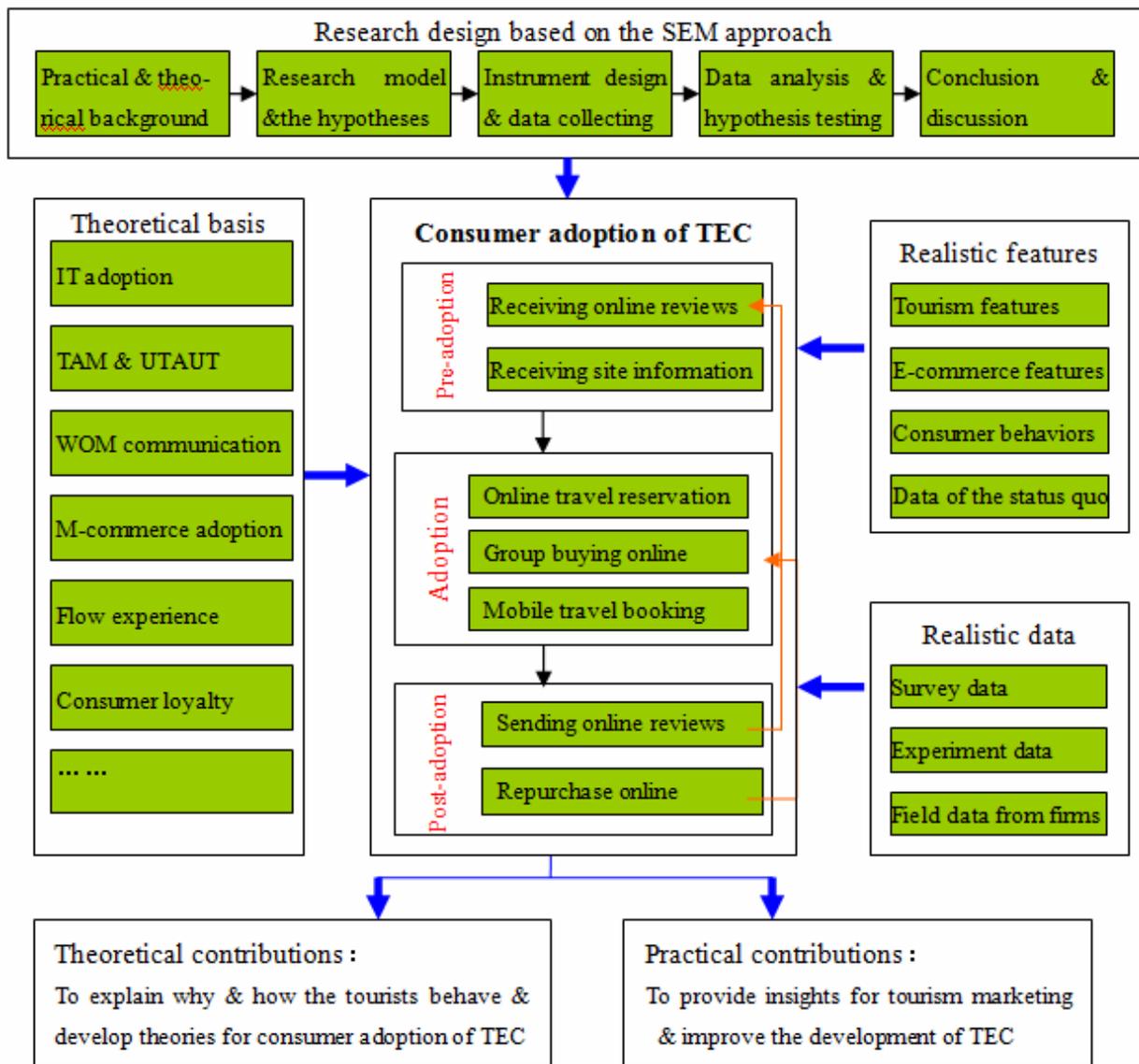


Fig. 1. The proposed framework for SEM-based future research

The framework can be explained in details as follows.

4.1 Empirical research on the impact of tourism website information on the visitors' travel decision

Various tourism websites provide rich information including online travel reviews from consumers and tourism product and service information from tourism firms, tourism destination organizations and related public sectors. After the visit to a tourism website involved a tourist product for some purpose, one may decide not to buy the product, to buy it offline or buy it online

directly. Why does he search for the tourism website? Why does he make the decision choice?

Answers can be found from the two respects listed bellow.

①Research on the determinants of impact of online travel reviews. Although the outcomes of online travel reviews have been well documented, the antecedents of the impact of online travel reviews remains uncertain. With reference to the theories in WOM communication (Bansal & Voyer, 2000; Lee et al., 2002; Hennig-Thurau et al., 2003), motivations to search for the online reviews may include low cost, time pressure, risk reduction, occasional acts and et al., with the influentials such as Internet efficacy and self involvement. Factors affecting the effectiveness of online reviews may be the sender's expertise, the receiver's expertise, the tie strength between the sender and the receiver, the objectivity, credibility and novelty of the content, and so on. Future research will examine the main forms and characteristics of online travel reviews ,select reasonable factors and build the SEM-based research model, collect data via questionnaire, process the data using SPSS, LISREL, AMOS or/and PLS, and draw the conclusion from data analysis.

②Research on the motivations for information search from official tourism websites and the impact on the travel intentions. The official tourism websites provide information for promotion, marketing and online services by the tourism destination organizations and tourism companies, which is quite different from the online travel reviews via interpersonal communication. What information exactly attracts the actual consumption and what information stopped the consumers at the virtual tour experience? Are the consumers addicted to the Internet with less outdoor activities more likely or not to book travel online? Besides a clear definition for the information functionality of the tourism websites and the specific activities in tourism, further research will show concerns on the interaction factors between the website and the visitors including external environment, flow

experience and consumers' personal factors, particularly the motivations for information search, spending power, prior knowledge, personalities and preferences (Kerstetter & Cho, 2004).

4.2 Empirical research on the antecedents of the consumer adoption of online reservation.

Online travel reservation, for airline tickets, hotel rooms, restaurant meals, train tickets or tickets of scenic spots, is the form of online purchase for tourism products. Tourism products are intangible, service oriented and information intensive. Tourists purchase the products in advance and across distance whether offline or online, so the perceived quality and risks may be the same in both contexts. Generally speaking, the purchase needs no delivery for goods but the demand is seasonal and flexible. The product prices are relatively high, much flexible and always cheaper when purchased online. Online reservation can be paid online or on the spot of the consumption and the cancellation may be or not be charged an additional fee. Online group buying is prevalent and the low price for tourism products in the off-season is attractive. The travelers in the trip are inconvenient to access the wired networks and much dependent on the mobile commerce. These features will illuminate the future research to model the psychology and behavior of the consumers in TEC adoption. The research can be conducted from these dimensions:

- ①Antecedents of the consumer adoption of online travel reservation.
- ②Antecedents of the consumer adoption of online group buying for tourist products.
- ③Antecedents of the consumer adoption of mobile reservation.

4.3 Empirical research on the motivations to contribute online reviews and repurchase intention after purchase.

After the online booking and consumption for the tourist product, a consumer may or may not publish online reviews and be willing to repurchase the product, whereas the determinants of the

consumer behaviors after TEC adoption remain unknown. Future research can go along these two paths:

①Determinants of the online travel review contribution. According to the traditional WOM communication theory, an online travel reviewer may be motivated by economic interests, social interests, altruism, help to businesses, entertainment, anxiety reduction, revenge, advice seeking, and so on (Hennig-Thurau et al., 2004; Sundaram et al., 1998). Customer satisfaction, customer commitment, curiosity and involvement including self involvement, product involvement and information involvement may also stimulate online reviews (Anderson, 1998; Brown et al., 2005). Future research can build SEM-based models referring to these factors and incorporating the fact of online travel reviews and collect data to test the hypotheses.

②Determinants of the online bookers' loyalty and re-booking intention. Generally speaking, tourists buy package tours and visit scenic spots for the novelty of the products so they won't plan to revisit the place in the recent years. However, the products frequently booked online are tickets, rooms and meals, which can be repurchased frequently by a consumer. This phenomenon suggests a new research area in the loyalty and re-booking intention of the online travel bookers. Consumer satisfaction and loyalty may result from the service quality a consumer previously experienced, the quality of the tourism website, perceived value, switching cost, flow experience, trust, network externalities, network identity, age and gender of the consumer, and so on (Zhou et al., 2009). Future research can build SEM-based models referring to these factors and incorporating the fact of online travel booking and collect data to test the hypothesized determinants that affect the online bookers' loyalty and re-booking intention.

5. Conclusion

The paper shows that the quantitatively empirical methods are trendy in the tourism electronic commerce research. Researchers have explored the impact of websites and online reviews on the travel planning, the determinants of online booking, customer satisfaction with the tourism websites and consumer adoption of mobile booking. We propose a framework for empirical research based on structural equation modeling to further the study of consumers' behavior in the adoption of tourism electronic commerce. The framework incorporates the research domains in consumers' information searching before purchase, in their various buying behaviors, and in their online review contribution and re-purchase intention after purchase. Future research under the framework is to explore the antecedents and consequences of the consumer adoption of tourism electronic commerce and is sure to shed light on tourism service management particularly in China.

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