Consumers' acceptance of information and communications technology in tourism: A review

Dandison C. Ukpabi *, Heikki Karjaluoto

University of Jyvaskyla, Finland

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ABSTRACT

The impact of information and communications technology (ICT) in tourism (e-tourism) has altered the ways tourism services are accessed and consumed. Ubiquitous and highly innovative ICTs provide different channels for consumers to use tourism services; thus, studies on e-tourism are numerous and fragmented. Different factors account for how consumers embrace these channels. The purpose of this study is to review studies on consumers' acceptance or adoption of e-tourism in order to group the studies, synthesize the theories, models and frameworks used and identify the antecedents influencing consumers' e-tourism acceptance and usage. A total of 71 studies from 2005 to 2016 (inclusive) from both tourism-based and non-tourism-based journals were selected, synthesized, and included. Based on their contexts, similarity and relevance, the 71 studies were segregated into three distinct groups. This study found that research among the groups is uneven. Implications and research directions are suggested.

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* Corresponding author.
  E-mail address: ukpabison@yahoo.com (D.C. Ukpabi).

1. Introduction

The ubiquity of computer systems and the availability of the internet have provided unhindered access to consumers of tourism services. e-Tourism has transformed the tourism and hospitality industry and greatly impacted all its sectors. For instance, revenue from online travel bookings stood at $340 billion in 2015 (Statistica, 2016). Therefore, making travel arrangements – that is, reserving and booking travel and tourism products – online has become a significant commercial sector (Wen, 2012). Similarly, social media have also provided a means through which consumers obtain information about tourism services. Social media platforms contain both positive and negative statements and reviews about destinations and services shared by consumers. The influence of social media on consumers' acceptance and usage of tourism services has been underscored by the increasing number of reviews on social media platforms, e.g., TripAdvisor. Currently, on TripAdvisor, there are 320 million reviews and opinions from 96 million marketable members worldwide; 200 new posts are made every minute (TripAdvisor, 2016).

Additionally, the deployment of mobile technology has fundamentally transformed tourism offerings. Mobile technology enhances transactions through mobile devices and provides guides, even when the tourist is at the destination. Mobile apps are reportedly the 7th most downloaded apps, with 60% of global smartphone users downloading travel apps onto their devices and 45% in this group using these apps regularly to plan travel (GoodWorkLabs, 2016).

Information and communications technology (ICT) has permeated virtually every sector. However, consumers adopt these emerging technologies in different ways. In an attempt to understand these differences and to explain the adoption process and their antecedents, researchers have proposed different theories, models and frameworks. Some of these theories were drawn from the social-psychological domains, e.g., Fishbein and Ajzen's (1975) theory of reasoned action (TRA) and Ajzen's (1991) theory of planned behavior (TPB). Some originated predominantly in the information systems (IS) field, e.g., Davis' (1989) technology acceptance model (TAM) and Venkatesh et al.'s (2003) unified theory of acceptance and use of technology (UTAUT). Similarly, scholars have used these theories to explain the intentions (Amaro and Duarte, 2015; Sahli and Legoherel, 2015) and usage of ICT in tourism (Herrero and Martin, 2012; Ku and Chen, 2015).

Studies that have examined different ways consumers adopt ICT in tourism and hospitality services abound, including such topics as factors influencing consumers' travel purchases online (Al-hawari and Mouakket, 2012; Escobar-Rodriguez and Carvajal-Trujillo, 2013; Kim et al., 2013; Lee and Cranage, 2011; Nunkoo and Ramkisson, 2013; Sahli and Legoherel, 2015), website design and booking intentions (Ku and Chen, 2015; Wu et al., 2011), the role of social media in booking travel online (Ayeh et al., 2013a, b; Book and Tanford, 2015; Parra-Lopez et al., 2011), and the role of mobile technology on travel planning and use (Chang et al., 2016; Kim et al., 2015; Lai, 2015; Okazaki and Hirose, 2009).

Several reviews have been conducted on the application of ICT in tourism (Appendix II). However, no apparent review has taken a deeper look at the dynamics of consumers' adoption of ICT in tourism services. Our study is unique because consumers' adoption is a critical success factor for the deployment of ICT in tourism, and synthesizing the theories, frameworks, models and antecedents used in these studies is crucial for both scholars and practitioners. Additionally, the dynamic nature of ICT – especially as it concerns tourism – requires a constant update in the literature, as this helps practitioners and scholars to keep abreast of the field (Law et al., 2009). Buhalis and Law (2008), for example, comprehensively analyzed e-tourism publications but provided no grouping for scalability. As such, they called for the extension of future reviews to non-tourism journals and a conceptual grouping of studies. Similarly, Law et al. (2009) suggested that future reviews should analyze studies based on geographical spread to determine the extent of ICT adoption in tourism and hospitality services. Finally, Law et al. (2014) suggested that future reviews analyze the theories used in these studies.

Consequently, this study aims to fill the above-mentioned gaps in the literature and to understand the factors influencing consumers' adoption of e-tourism. Specifically, the objectives of this study are to achieve the following:

- Identify and synthesize the antecedents of consumers' adoption of e-tourism;
- Provide a classification framework for consumers' adoption of e-tourism based on previous studies;
- Identify the theories, models and frameworks used in order to synthesize their applications in various domains;
- Analyze the geographical spread of studies identifying the behavioural dynamics of consumers with respect to ICT adoption in tourism.

This study is significant for both scholars and practitioners. First, the grouping of the studies will offer new research opportunities, thus revealing under-researched areas (Shaikh and Karjaluoto, 2015a, b). Second, the synthesis of the theories,

models and frameworks will provide a solid theoretical background for subsequent research in this area (Okoli and Schabram, 2010). Third, the analysis of the antecedents and concepts, in line with Webster and Watson (2002), will enunciate the present state of research and serve as a pool for subsequent studies. Fourth, this will expose practitioners to underpinning practical antecedents that may serve as levers to attract more consumers, thus allowing them to remain competitive in business. The remainder of the study is organized as follows: Section 2 traces the background of consumers' adoption of e-tourism; Section 3 describes the research methods; Section 4 presents the results; Section 5 provides discussions and implications, contributions of the study, limitations and future research directions.

2. Background on e-tourism and its adoption by consumers

Because tourism is an information-intensive sector, a central reservation system was often used to store and retrieve information and conduct transactions (Buhalis, 2000), thus creating a central customer database. Booking in tourism services depended on travel agents, who mediated the relationship between tourism firms and customers (Buhalis, 1996). However, the ubiquity of computer systems and the emergence of the internet transformed and revolutionized the way tourism transactions are conducted (Buhalis and Jun, 2011). The internet has become a place for consumers to search for tourism-related information, purchase tourism products and services, and obtain others' opinions.

Uncertainty about the safety of online tourism bookings and transactions influenced early streams of research to focus on security (Kim et al., 2006), privacy (Lee and Cranage, 2011) and trust (Wu and Chang, 2005). Particularly, security was considered the most important consideration for online booking (Kim et al., 2006; Ryan and Rao, 2008). Increases in consumers' adoption and use of web-based platforms in tourism and hospitality services created website quality concerns, thus influencing research on website design quality (Ku and Chen, 2015). Ease of navigation and information quality became important considerations for attracting and retaining customers (Wong and Law, 2005; Kaplanidou and Vogt, 2006), as user-friendly websites enhanced information search and helped tourists arrive at quick decisions (Ku and Chen, 2015). Meanwhile, Destination Marketing Organizations (DMO) realized that the internet offered abundant opportunities for their operations. As a result, websites were designed to reflect destination attributes, thus influencing the perceived image of the destination and creating a virtual experience for the consumer (Sparks and Pan, 2009). Importantly, as argued by Chow and Murphy (2011), actual travel and the intention to travel were influenced by sightseeing, culture and heritage activity; consequently, consumers were attracted to destination websites that reflected these attributes.

Moreover, the emergence of Web 2.0 redefined consumers' adoption of e-tourism. Web 2.0 is defined as "a wide array of electronic applications (e.g., social networks, review websites, blogs, interactive websites and photo- and video-sharing platforms), which facilitate interactions among individuals and among companies and users". Through these platforms, especially social media, consumers easily form communities of members who share similar interests in a structured set of social relationships (Zhu et al., 2016). Thus, experiences with tourism products and services are shared in the form of photos, comments and reviews and are easily accessed by others (Ho and Lee, 2015). Marketers also share content to promote their products; however, consumer-generated media are perceived to be more trusted and sincere, constituting the real experience(s) of the creator (Wang, 2012). Consequently, reading content about tourism products and services has become an important pre-trip decision-making process (Tsao et al., 2015).

Furthermore, the market penetration of mobile technology (Shaikh and Karjaluoto, 2016) also influenced the adoption of tourism products and services. The ubiquity, flexibility, personalization and dissemination features of mobile technology make it a veritable tool for both marketers and consumers in tourism and hospitality services (Kim et al., 2008). For consumers, the functionality of mobile technology, such as the ease of access to travel information and trip guides, is an essential feature of its increased adoption, whereas for marketers, it is the opportunity to send marketing messages to a targeted audience. However, individual differences determine mobile technology adoption in tourism and hospitality services. For instance, Kim et al., 2008) reported that experienced and frequent travelers have a higher rate of mobile technology adoption than inexperienced and infrequent travelers.

A thorough literature search reveals two main applications of the e-tourism concept. First, the use of the internet in tourism services (Fodor and Werthner, 2005; Cardoso and Lange, 2007), and second, the use of mobile applications in tourism (Siricharoen, 2008; Sebastia et al., 2009; García-Crespo et al., 2009). However, Buhalis and Deimezi (2004, p.103) posited, "e-tourism reflects the digitalization of all processes and value chains in the tourism, travel, hospitality and catering industries", thus implying all uses of ICT in tourism-related firms. In the context of this study, e-tourism is defined as the ICT-enabled means by which consumers access and consume tourism and hospitality products and services. Our use of 'adoption' in this study implies consumers' intention to use and use of e-tourism, and the terms 'tourist' and 'consumers' imply those who consume tourism products.

3. Research methodology

3.1. Literature search

Previous literature reviews (Appendix II) on e-tourism were thoroughly analyzed and synthesized; a plan based on their recommendations was drawn up. The first suggestion was to identify keywords for the basis of a literature search

and extraction. The second recommendation was the establishment of literature inclusion criteria. The third was the classification of literature search into three major areas based on similarity, contexts and relevance. This suggestion was considered particularly important because it will provide a guiding structure for the study and identify gaps and challenges. Major search terms include 'e-tourism', 'e-tourism adoption', 'online tourism adoption', 'tourism website adoption', 'social media tourism adoption', 'Web 2.0 adoption in tourism', 'mobile tourism adoption', 'online destination image' and 'online tourism intention and use'. Google Scholar and Web of Science were used first. Further search included ScienceDirect, SAGE, Wiley, Springer, Emerald, Taylor & Francis, JSTOR and Inderscience. To take full advantage of this exercise, a ten-year period was set from 2005 to 2016. To avoid duplication, all the studies were saved into one folder with the title of each study as its file name. Therefore, it was easy to detect studies that appeared more than once; these duplicates were subsequently deleted.

3.2. Literature selection

The literature search yielded a large number of studies. To limit the studies to a manageable size, the researchers speed-read each article's abstract, introduction, methodology and texts from relevant sections to ascertain its relevance and potential for inclusion (Lu and Stepchenkova, 2015). Only accepted studies were fully read and analyzed (Appendix I). Guided by Baron et al. (2014), who posited that stability, reproducibility and accuracy are pillars of a good literature review, the inclusion criteria required that each included study must be a peer-reviewed article, consumer-based, and empirical, include measures for independent and dependent variables, have a defined sample size and provide detailed results of data analysis. Additionally because tourism is a large and heterogeneous industry (WTTC, 2016), capturing all e-tourism-related research would make the study unwieldy. Consequently, we limited our literature inclusion to e-tourism studies in hospitality and accommodation, catering, events, travel and heritage and government. After the screening stage, 71 studies were found to be useful for the study.

3.3. Justification for classification of the literature and framework

Based on one of our objectives, studies were classified according to similarity, contexts and relevance. Consumers' adoption of e-tourism was expressed mainly through browsing, reservation, booking and security concerns on tourism and hospitality firm websites (e.g., Amaro and Duarte, 2015). Another important channel for consumer adoption of e-tourism is social media, otherwise called Web 2.0 (e.g. Casaló et al., 2010). Finally, a critical analysis of the studies revealed a very important area of e-tourism, that is, mobile technology (e.g., mobile apps and devices) in tourism and hospitality services (e.g., Kim et al., 2015). Based on the above, we classify the 71 studies into three groups comprising Consumer Adoption of Web-Based Services in Tourism (CAWST), Consumer Adoption of Social Media in Tourism (CASMT) and Consumer Adoption of Mobile Information Services in Tourism (CAMIST), as shown in Fig. 1.

The first classification, CAWST, covers the services consumers derive from tourism and hospitality organizations' websites. This classification comprises research on consumers' intentions to purchase as influenced by website functionality, navigability, interactivity, security and privacy concerns. Specifically, it includes tourism information search (Kaplanidou and Vogt, 2006; Lin, 2010), reservation and booking (Kucukusta et al., 2015), and online shopping for travel services (Kamarulzaman, 2007; Kim et al., 2009; Wong and Law, 2005). Additionally, it covers studies on tourism websites' influence on destination image (Chung et al., 2015). The second classification, CASMT, covers studies on social media's influence on consumers' adoption of tourism and hospitality services. Social media platforms include virtual communities (e.g., Lonely Planet), media-sharing tools (e.g., YouTube), blogs (e.g., Xanga.com), microblogs (e.g., Twitter), review sites (e.g., TripAdvisor), and social networking sites (e.g., Facebook). Lastly, CAMIST covers studies on mobile information systems' influence on consumers' adoption of tourism and hospitality services. Specifically, it covers mobile tourism shopping (Kim et al., 2015), mobile travel apps (Lai, 2015), mobile internet (Okazaki and Hirose, 2009), smartphones and tablets (No and Kim, 2014) and recommender systems (Chung et al., 2014).
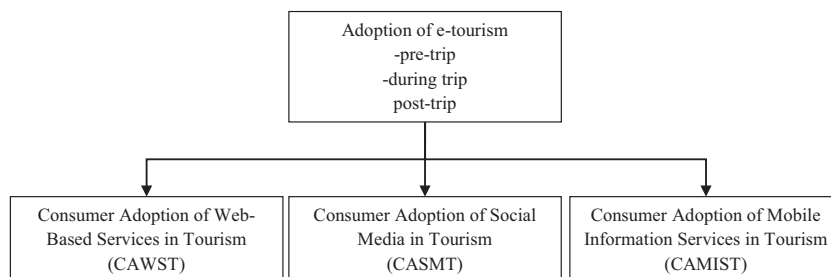

Fig. 1. Classification framework for consumers' adoption of ICT in tourism.

3.4. Identification of variables of interest

As noted earlier, the study is consumer-based; therefore, variables of interest were factors influencing consumers' adoption of ICT in tourism. The identification of the variables followed the classification of the studies. Thereafter, we adopted Webster and Watson's (2002) concept-driven approach and following the examples of previous reviews (Cheung and Thadani, 2012; King et al., 2014; Shaikh and Karjaluoto, 2015a, b), we manually derived these variables from the theories, models and frameworks used in each of the studies.

4. Results

4.1. General Findings (statistics)

The review of the 71 studies was drawn from 16 tourism and 14 non-tourism journals (Appendix III). The journals were extracted from five databases (Fig. 2). The Eastern Asia region comprising China, Hong Kong, Japan, Republic of Korea and Taiwan contributed 37 (52%) studies, with Taiwan alone offering 15 (21%). Only one (1.4%) study came from South Asia (the Indian Sub-continent); it was conducted in Singapore.

Europe offered 14 studies (19.7%), with Spain alone providing nine (12.6%). The United States of America (USA) had 10 (14%) and Middle East, four (5.6%), mainly from the United Arab Emirates (UAE) and Iran. Africa contributed one study (1.4%), which was conducted in Tunisia. The highest number of studies were published in 2015, 2013 and 2012, with 12 (16.9%), 11 (15%) and 10 (14%), respectively. 2005 and 2006 recorded the fewest publications, with two (2.8%) in each year. However, because this study was conducted in early 2016, only one study was reflected in this year, as indicated by a dashed line (Fig. 3).

Different sampling techniques were utilized, however, the majority of the studies adopted the convenience sampling method (e.g., Wen, 2013). To obtain responses, various methods were employed, including web-based and email communication (59%), on-site and face-to-face contact (34%), and postal communication (1%). Six percent used both web-based/email and on-site methods (Fig. 4). Samples comprised residents, tourists, students, internet users, and international tourists. The average sample size was 548.
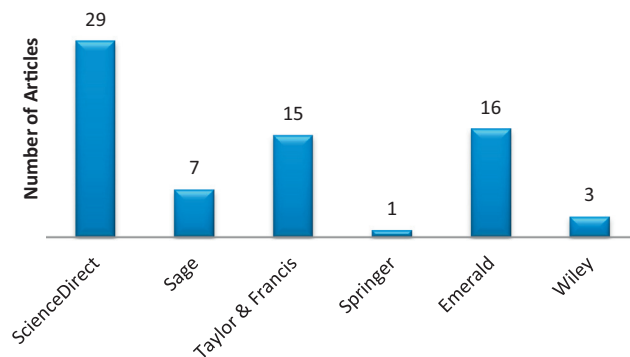

Fig. 2. Database distribution of articles.

Fig. 3. Year-wise distribution of articles.

1%

6%

34%

59%

■ Web-based/E-mail
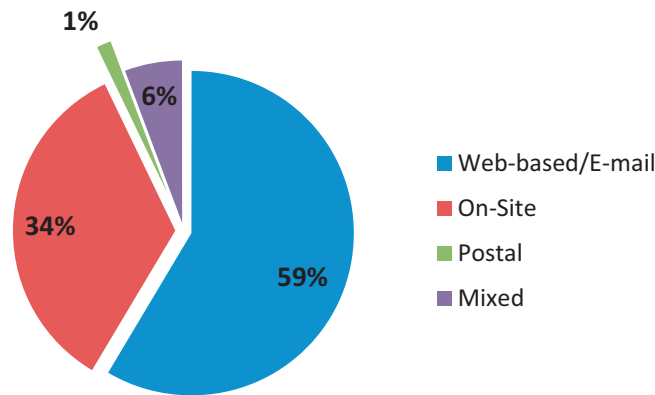■ On-Site
■ Postal
■ Mixed

Fig. 4. Data collection methodology.

4.1.1. Major theories, models and frameworks

The 71 reviewed articles revealed the use of 28 different theories, models and frameworks, mainly from the technology adoption and social and psychological adoption paradigms (Appendix I). The technology adoption model (TAM) was the most-used model, appearing in 33% of the studies (24 of the 71 studies). The TAM model investigates the impact of technology on user behavior, using two key constructs: perceived usefulness (PU) and perceived ease of use (PEOU). The identified weaknesses of the TAM model in predicting technology adoption at the individual level required that some studies combine the theory with other models (Casaló et al., 2011; Jarvelainen, 2007) and extend the theory by adding other constructs (Ayeh et al., 2013a, b; Herrero and Martin, 2012; Morosan and Jeong, 2008). The theory of planned behavior (TBP) was used in 10 studies (14%) and the unified theory of acceptance and use of technology (UTAUT) was used in five studies (7%); the theory of reasoned action (TRA) was used in four (5%), while the elaboration likelihood model (ELM) was used in three (4%). Some studies combined as many as four models; TRA, TPB, TAM and IDT (Amaro and Duarte, 2015), while others combined three models (Al-hawari and Mouakket, 2012; Casaló et al., 2010; Kim et al., 2012; Lu et al., 2015).

4.1.2. Major antecedents/constructs

The most commonly used antecedents were those derived from the TAM model: PU and PEOU. PU implies that the user believes the technology will improve his/her performance, while PEOU implies that the user believes using the technology will be free from effort. The analyses of the tested relationships between PU and behavioural intentions reveal 15 tested relationships, and only one was rejected, while PEOU had 11 tested relationships with behavioural intention, and only 6 were accepted. To underscore the importance of satisfaction as an antecedent of intention, Ku and Chen (2015) found a positive relationship between website design quality and satisfaction, which leads to continued usage intention. Additionally, service quality is important for predicting customer satisfaction and purchase intention; thus, while the TAM explicitly explains intentions, it should be expanded to incorporate satisfaction in the online context (Hsu et al., 2012). The dependent variables were attitude, behavioural intentions and usage. Attitude was tested in 17 studies to predict behavioural intentions, and all were supported. Similarly, only one study used attitude to predict use behavior, and it was accepted. Approximately 12 studies used both PU and PEOU to predict attitude, and all were accepted.

4.2. Domain-specific Findings

This section will summarize the publications in each of the three domains. Although some constructs were the same in each of the three classifications, their contextual definitions differ. Consequently, this section will define the constructs used in the contexts of the three domains.

4.2.1. Consumer adoption of web-based services in tourism (CAWST)

CAWST covers the services consumers derive from tourism or hospitality organizations' websites. Generally, this domain classification focuses on these websites' influence on adoption. Out of the 71 reviewed studies, 57% (40 of 70) of the studies were published under this domain; 11 studies investigated tourism and hospitality websites' influence on destination image and destination choice (e.g., Chow and Murphy, 2011; Hosany and Prayag, 2013; Lee, 2009). Similarly, 13 studies investigated the influence of website design and quality on online booking and reservation (e.g., Chen, 2007; Kamarulzaman, 2007; Kucukusta et al., 2015). Additionally, trust, security and privacy were found to influence online booking and payment for tourism and hospitality products (Jarvelainen, 2007; Kim et al., 2006, 2013), as personal innovativeness influenced the

Table 1
Factors associated with CAWST.

Construct	Definition	Frequency	Author(s)
Website design quality	The technological aspects of a website, such as navigation, appearance, and layout	2	Ku and Chen (2015), Wen (2012)
Website service quality	The efficiency and ease with which a consumer completes a task using a website	1	Ku and Chen (2015)
Information quality	The reliability, currency, relevancy, completeness and accuracy of information on a website facilitating customers' decision making	4	Chung et al. (2015), Lin (2010), Escobar-Rodriguez and Carvajal-Trujillo (2013), Hsu et al. (2012), Wong and Law (2005)
Interactivity	The capacity for bidirectional contact and communication between the user and the supplier (website)	2	Ku and Chen, 2015; Herrero and Martin, 2012
Complexity	The degree to which purchasing travel online is perceived to be difficult	2	Amaro and Duarte (2015), Chen (2007)
Navigability	The level of ease/difficulty in moving throughout the website	1	Herrero and Martin (2012)
Satisfaction	Perceived degree of contentment with regard to a customer's prior purchase experience with a given electronic commerce firm	9	Bai et al. (2008), Chen and Kao (2010), Chung et al. (2015), Hosany and Prayag (2013), Hsu et al. (2012), Kim et al. (2006), Ku and Chen (2015), Lee (2009), Luque-Martinez et al. (2007)
Perceived enjoyment	Consumers' perceptions regarding the potential entertainment of internet shopping	3	Huang et al. (2013), Ku and Chen (2015), Sahli and Legoherel (2015)
Perceived Compatibility	The extent to which consumers believe that purchasing travel online fits/matches their lifestyle, needs, and shopping preference		Amaro and Duarte (2015), Chen (2007), Sahli and Legoherel (2015)
Transaction security	Consists of guarantees and warranties, the discretionary use of private information, the clarity of refund policies, and the risk-free nature of online transactions	4	Escobar-Rodriguez and Carvajal-Trujillo (2013), Kim et al. (2013, 2006), Ryan and Rao (2008)
Trust	An attitude of confident expectation in an online situation of risk that one's vulnerabilities will not be exploited	10	Al-hawari and Mouakket (2012), Amaro and Duarte (2015), Escobar-Rodriguez and Carvajal-Trujillo (2013), Kamarulzaman (2007), Kim et al. (2009, 2013), Munoz-Leiva et al. (2012), Nunkoo and Ramkisson (2013), Sahli and Legoherel (2015), Wen (2012)
Functionality	The clarity of search-related words, the usefulness of help functions, the level of technology on websites, and the overall operational efficiency in making online purchase decisions	5	Bai et al. (2008), Kaplanidou and Vogt (2006), Kim et al. (2013), Lin (2010), Ryan and Rao (2008)

Table 2
Factors associated with CASMT.

Construct	Definition	Frequency	Author(s)
Information accuracy	The correctness in the mapping of stored information to the appropriate state in the real world that the information represents	1	Filieri and McLeay (2013)
Information relevance	The extent to which a review is applicable and helpful for a task at hand and depends on different customer needs in specific situations	1	Filieri and McLeay, 2013
Information reliability	The extent to which information on social media is perceived to be credible		Chung and Koo, 2015
Valence of reviews	Positively or negatively framed reviews	2	Book and Tanford (2015), Sparks and Browning (2011)
Trustworthiness	The degree of confidence in the communicator's intent to communicate the assertions he/she considers most valid	2	Ayeh et al. (2013a, b)
Homophily	People's perceptions of others' similarity to themselves in terms of personal characteristics	1	Ayeh et al. (2013a, b)
Flow:	A state of the most enjoyable experience possible when a person is unconsciously engaged in an activity such that he or she becomes so absorbed that he or she loses the sense of self		Ku (2011), Wu and Chang (2005)
Perceived enjoyment	The degree of playfulness experienced while using social media for travel	5	Ayeh et al. (2013a, b), Chen et al. (2014), Chung and Koo (2015), Ku (2011), Wu and Chang (2005)
Source credibility	The believability of some information or its source on social media	2	Ayeh et al. (2013a, b), Wang (2015)
Reviewer expertise	The extent to which the reviewer is perceived as being capable of providing correct information	2	Ayeh et al. (2013a, b), Zhao et al. (2015)
Content novelty	The degree to which the information within a traveler's blog is perceived to be new	1	Chen et al. (2014)

Table 3
Factors associated with CAMIST.

Construct	Definition	Frequency	Author(s)
Involvement	The degree of interest in the mobile device or app	2	Chang et al. (2016), Kim et al. (2015)
Use context	Personal and environmental conditions that influence the use of mobile devices in purchasing or reserving tourism products or services	1	Kim et al. (2015)
Informativeness	The degree to which the mobile device or app contains relevant, timely, up-to-date and correct informative	1	Lai (2015)
Mobile self-efficiency	Degree of ability by which consumers consider themselves able to independently use mobile device or tourism apps in order to obtain information	1	Chang et al. (2016)
Information gain	Extrinsic pull motivations are connected to external, situational, or cognitive aspects	1	Chung et al. (2014)
Entertainment	Enjoyment, fun, pleasure and excitement that tourists experience when using mobile device or tourism apps	1	Lai (2015), Lu et al. (2015)

purchase of tourism products on tourism websites (Lee et al., 2007). In line with Webster and Watson (2002), Table 1 contains the antecedents, definitions, and frequency (the number of times used in the domain) and the authors who applied them in their studies.

4.2.2. Consumer adoption of social media in tourism (CASMT)

CASMT covers studies on social media's influence on intentions to travel. Of the 71 studies, 22 (31%) were published under this domain. Among social media platforms, blogs dominated research themes (Chen et al., 2014; Wang, 2011, 2012). Theories, frameworks and models used in this domain included TAM (Casaló et al., 2010; Lin, 2007) and an extension of TAM (Ayeh et al., 2013a, b), TPB (Jalilvand and Samiei, 2012), TRA (Hsiao et al., 2013), ELM (Filieri and McLeay, 2013), and flow (Wu and Chang, 2005; Ku, 2011). Some had a combination of models or theories: ELM and TPB (Wang, 2015), TPB, TAM and SIT (Casaló et al., 2010). Additionally, a majority of the studies built their conceptual frameworks on the electronic word-of-mouth (e-WOM) theory, with some extensions and modifications (Sparks and Browning, 2011; Jalilvand et al., 2012; Zhao et al., 2015; Wang, 2011). Other antecedents are shown in Table 2.

4.2.3. Consumer adoption of mobile information system in tourism (CAMIST)

CAMIST represents studies dealing with consumers' adoption of mobile information systems in tourism. The ubiquity of smartphones and tablets and the corresponding increase in mobile application development are expected to greatly impact

the tourism industry. As an information-intensive sector, information interchange is very crucial for both service providers and tourists. In spite of the importance of these emerging tools for the tourism industry, research on CAMIST in tourism remains scarce. Specifically, 11% (8 out of 71) of the reviewed articles were in this domain. The first study in this stream was conducted in 2008 (Kim et al., 2008), with 2015 publishing the highest number of studies (see Appendix I). Two studies used the UTAUT model (Lai, 2015; No and Kim, 2014), one study used TAM (Kim et al., 2008), and another used TAM in combination with IDT and SCT (Lu et al., 2015). Others used ELM, DTPB, GT, NT and UDT (see Appendix I). The antecedents and authors who applied these models in this domain are shown in Table 3.

5. Discussion/implications

The aim of this study was to provide a review of consumers' adoption of e-tourism; antecedents of e-tourism adoption; synthesis of the theories, models and frameworks and a classification based on a grouping of relevant studies. Consequently, the 71 reviewed articles were classified into studies on CAWST, CASMT and CAMIST.

CAWST depended on website attributes and consumers' personal characteristics. Consumers consider security, navigation functionality and information quality as important website attributes for online tourism transactions (Kim et al., 2013; Chung et al., 2015). Wen (2012) found that quality of website design has had a positive influence on consumers' attitude towards online purchases of travel and tourism products. Particularly, consumers' adoption of a particular website for hotel bookings was influenced by the information available on the website, security, and content-motivating visuals (Wong and Law, 2005; Kim et al., 2006; Ryan and Rao, 2008). Incorporating privacy assurance on travel websites increases the perceived usefulness of services and decreases customers' privacy concerns, thus influencing adoption (Lee and Cranage, 2011). In fact, consumers' emotional involvement, attitude, innovativeness and flow are important personal characteristics for the purchase of travel online (Kim et al., 2012; Huang et al., 2013). However, consumers of low-cost airlines who purchase tickets online are influenced mostly by their trust and habits in using such websites (Escobar-Rodriguez and Carvajal-Trujillo, 2013).

CASMT is influenced by pre-trip, during-trip and post-trip behaviors. Additionally, consumers' personal characteristics, the characteristics of the source and the elements of the content influence social media content use for travel information search. Thus, experienced, involved and innovative consumers are more predisposed to use social media for travel information search (Ku, 2011). Those who belong to the same network and those outside the network can access shared content; thus, source credibility (expertise and trustworthiness) becomes an important determinant of content believability (Ayeh et al., 2013a, b). Furthermore, novelty, understandability and interesting elements in a travel blog influence adoption (Chen et al., 2014). Advice from the online community is more influential than marketer-generated content; consequently, consumers are influenced most by negative reviews, especially when those reviews are negatively valenced (Sparks and Browning, 2011).

CAMIST comprises mobile devices and mobile applications (Shaikh and Karjaluoto, 2015a, b). Perceived usefulness, ease of use and informativeness will allow mobile technologies to continue to grow among tourism consumers (Chang et al., 2016), even though these factors are not seen to pose an immediate threat to traditional personal computers (PCs) (Okazaki and Hirose, 2009). In terms of personal factors, trip and technology experiences are important determinants; thus, frequent travelers have a higher adoption rate of CAMIST (Kim et al., 2008). Consumers show more satisfaction with mobile applications that contain more travel-related information (No and Kim, 2014), which are, thus, more gratifying than the PC internet (Okazaki and Hirose, 2009).

5.1. Contributions of the study

First, the identification of three domains that influence consumers' adoption of e-tourism –CAWST, CASMT and CAMIST – indicates that research in these areas is uneven. While there is preponderance of research on CAWST and CASMT, there is an evident dearth of research on CAMIST. Increasing mobile devices and applications are emerging, and tourism and hospitality service providers are increasingly deploying these technologies to ensure consumer satisfaction. Therefore, studies on the factors that influence the adoption of these mobile technologies are essential. The growth of mobile technology use across different groups indicates that social and cultural factors play a role in their adoption. Consequently, Lu et al. (2015) suggested investigating potential differences in user needs from travel apps across different groupings and cultures.

Second, this study further reveals that the models used in the majority of the studies were the TAM, TPB, UTAUT and TRA. Some studies used the above models according to their original postulations, while others modified or extended them (Huang et al., 2013; Kim et al., 2009). Additionally, several studies borrowed constructs from established models and frameworks in the social and psychological disciplines (Chung et al., 2015; Filieri and McLeay, 2013). Furthermore, because studies on CASMT are rooted in the e-WOM literature, the majority of the studies adopted e-WOM as a conceptual model but borrowed constructs mainly from TAM. Similarly, the most-tested paths were drawn from the TAM constructs, which included the PU, PEOU, Attitude (ATT) and Behavioral intention (BI). For instance, effect of ATT on BI was tested in 17 studies, which all were accepted; PU on BI were tested in 15 studies, and 14 (93%) were accepted; and PEOU on BI was tested

by 11 studies, and 6 (54%) were accepted. The path analysis of the proposed UTAUT constructs and their acceptance rates were equally high.

Third, the reviewed studies show that the influence of website design quality on destination image perception and choice featured prominently in the CAWST classification. Additionally, security, privacy and trust were highlighted as important considerations in consumers' booking, reservation and payment for tourism services on tourism and hospitality firms' websites. The majority of the studies on the CASMT classification focused on adoption via Facebook, Twitter and blogs. However, many other social media platforms that are very important in the tourism and travel industries, such as TripAdvisor, YouTube, Lonely Planet, Flickr, Delicious and Digg, have received scant attention.

Fourth, the reviewed studies offered many practical implications that can aid managers in the tourism and hospitality sector to strategically position their services in the emerging information technology and systems era. In this vein, for managers of the tourism and hospitality services to attract and retain customers, they must understand the role of website design, social media and mobile technology as e-tourism platforms. Specifically, Ku and Chen (2015) suggest that managers should ensure that e-tourism websites incorporate features that ensure quick navigation, interaction and creativity in packaging information content enhanced through audio and video clips, which have the potential to enhance tourists' perception of reality. Destination image perception and choice constitute an important research stream in tourism studies. The emergence of the internet has helped to better inform tourists about destinations. For instance, Sparks and Pan (2009) argue that most Chinese tourists obtain information on possible destinations online. It is therefore imperative for managers to incorporate features on e-tourism websites that enhance a positive perception of destination image.

Finally, in order to ensure effective participation in firm-hosted online travel communities, Casaló et al. (2010) suggest that firms promote group cohesion and communication among community members by encouraging shared identity; this can be achieved by organizing meetings among the community members. In this way, new members who are likely to visit the destination can be introduced to the community. Finally, Chang et al. (2016) posit that managers should develop mobile applications that are contextually customizable in relation to the needs of the tourist.

5.2. Limitations and future research directions

The study is not without limitations. First, a major limitation of the study is that it was based on quantitative studies only. Reviews that incorporate both qualitative and quantitative studies are more comprehensive. Another limitation of this study is that it did not incorporate other sources, such as conference proceedings, book chapters, and conceptual papers, which might have impacted the study differently. Additionally, the literature search was conducted from October 2015 to January 2016; thus, only one paper was included for 2016. Other publications beyond January 2016 are obviously not included in the study. Finally, while the literature search was extensive, we may have missed some publications within the period of inclusion.

One outstanding finding of the study is the scant research on CAMIST, which includes the adoption and use of mobile devices and applications. Travel information is dynamic and requires context-specific mobile applications; therefore, more research should be focused on the factors influencing the adoption of these mobile technologies. Second, Facebook and blogs were the most commonly studied platforms in the CASMT domain. Important platforms such as YouTube, Delicious, Digg, and Lonely Planet are also very important for travel and tourism; further research should incorporate these networks into the literature on social media in tourism. Finally, the reviewed studies found an uneven geographical spread of studies. While many studies have been conducted in Asia (Taiwan and China), the USA, and most parts of Europe, some emerging markets such as India and Africa, are largely absent, ignoring the increase in internet subscriptions in these emerging markets. Future research on these emerging markets will likely provide valuable insights.

Acknowledgment

Appendix I.

S/N	Author/ Year	Purpose	Country	Methodology			Independent Variable(s)	Dependent Variable(s)	Theory /Model/ Framework	Findings
				Data Collection	**Sample/ Unit of Analysis**	**Data Analysis**				
Consumer adoption of web-based services in tourism (CAWST)										
1	Ku & Chen (2015)	To investigate how design and service quality of public tourism websites affect satisfaction	Taiwan	Online survey	256; Individuals	Structural equation modelling (SEM)	Satisfaction, Website Design Quality Enjoyment, Web ervice Quality. Interactivity as moderating variable	Continued website usage intention	TAM, EUS	There is positive relationship between website design quality and satisfaction. Also, a tourist's satisfactions positively influences his continued usage intention.
2	Amaro & Duarte (2015)	To examine factors influencing purchasing travel online	Portugal	Online survey	1,732; colleagues and acquaintances	SEM	Compatibility, Perceived Relative Advantages, Attitude, Complexity, Perceived Behavoural Control, Communication, Trust, Perceived Risk	Intentions to purchase travel online	TRA, TPB, TAM, IDT	Intentions to purchase travel online are mostly determined by attitude, compatibility and perceived risk.
3	Kim, Lee & Chung (2013)	To examine the influence of trust in online tourism repurchase intention	Republic of Korea	Online survey	340, potential online tourism shoppers	SEM	Trust, Benevolence, Integrity, Ability, Transaction security, Navigation functionality, cost effectiveness	Repurchase intention	TCT	It found that transaction security, navigation functionality and cost effectiveness affect trust which in turn affect repurchase intention.
4	Chung, Lee, Lee & Koo (2015)	To investigate the relationship between the qualities of DMO and continuous usage intention	Republic of Korea	Online survey	169; tourists	SEM	Destination website usefulness, Destination website satisfaction, Destination website quality confirmation	Usage Intention	ECM	Information quality was an important factor in deciding a destination website. It also found that the continuance to visit the website influence the use of the website

							(information quality, service quality, design quality)		
5	Sahli & Legoherel (2015)	To examine the factors influencing intention to book tourism online	Tunisia	Online survey (Facebook)	389; internet users	SEM,	Perceived enjoyment, Subjective norms, Attitude, Compatibility, Perceived usefulness, Perceived ease of use, Perceived Behavioural control, Trust, Risk, Benefit	Intention to book online	DTPB, TAM	The Tourism Web Acceptance Model (T-WAM) model, ncorporating variables from different fields of research, is a robust model that explains 50.6% of the variance for booking tourism products online. Thus, the T-WAM predicts behavioral intention well, with a considerable empirical advantage compared to other models used.
6	Nunkoo & Ramkisson (2013)	To examine travelers intention to purchase tourism products online	Australia	Self-administered survey	438; tourists	SEM	Attidude, Perceived usefulness, Perceived ese of use, Trust, Perceived risk	Intention to book	TAM	Perceived usefulness, trust, and perceived risks are determinants of attitude to e-purchasing, which in turn significantly influences e-purchase intent. Also, perceived ease of use exerts a significant influence on perceived usefulness and trust while the latter negatively influences perceived risks.
7	Lee (2009)	To investigate how destination image, attitude, motivation affect future behavior of tourists	Taiwan	Face-to-face	179, tourists	SEM	Satisfaction, Image, Attitude, Motivation	Future Behaviour	TPB	Destination image is a critical influence on tourist satisfaction in wetland.
8	Wen (2012)	To investigate factors affecting consumers' online purchase intention	USA	Online survey	559, online travel buyers	SEM	Trust, Quality of website, Attitude	Purchase intention	TPB	Quality of website design was had positive influence on consumers attitude towards online purchase of travel and tourism products
9	Liu & Zhang (2014)	To investigate the factors influencing travelers choice of online channel	China	Mixed method: interviews (operators); online and offline questionnaire administratio n.	437, online hotel bookers	SEM	Information search intention, product related factors, Channel related factors	Purchase intention	Purchase intention	All hypotheses were supported. That is information search intention, product related factors and channel related factors positive influenced purchase intention.
10	Castaneda, Frias,	To investigate the factors	Spain	Fact-to-face,	340, tourists	SEM	Future use,	Actual use	TAM	Perceived usefulness is having

	Rodriquez (2009)	driving ICT as a source of information in the tourism business					Attitude, Usefulness, Ease of use				stronger effect on actual use than perceived ease of use.
11	Sparks & Pan (2009)	To investigate Chinese outbound tourist's values in terms of destination attributes and attitudes towards international travel	China	Face-to-face	496, Chinese tourists	SEM	Subjective norm, Attitude, Constraints and perceived control, Importance of destination attributes, Likelihood of Australia, Information sources	Intention to visit Australia	TPB	Subjective norm was positively related to behavioural intention to travel.
12	Herrero & Martin (2012)	To investigate factors influencing the use of rural tourism accommodation website	Spain	Face-to-face	1083, Spanish tourism web users	SEM	Perceived usefulness, (information n accommodation, information on destination(Perceived ease of use (interactivity of the website, navigability of the website)	Intention	TAM	Perceived usefulness and perceived ease of use positively influenced intention
13	Al-hawari & Mouakket (2012)	To investigate how offline factors trigger online continual usage by customers of airline e-ticket booking services	UAE	Face-to-face	258, students	SEM	Image, Trust, Employee-based service quality, Subjective norm	Online continual Usage	TTPT, CDT, IDT	Employee-based service quality was provided to have high, significant and positive relationship with pre-existing offline trust and pre-existing offline image
14	Kim, Lee, Lee & Song (2012)	To examine the factors influencing travel decisions overseas among women	Republic of Korea	Online survey	400; South Korean tourists	SEM	Behavioural desire, Attitude, Subjective Norms, Negative anticipated emotions, Positive anticipated emotions	Behavioural intention	MGB, TRA, TPB	All hypotheses were supported. Attitude, subjective norms, negative anticipated emotions, and positive anticipated had a significant effect on behavioural desire.
15	Lin (2010)	To investigate the factors influencing the users acceptance or rejection of e-travel sites	Taiwan	Online survey	242, students in Taiwan	SEM	Perceived ease of use, Perceived usefulness, User interface,	Behavioural intention	TAM	All hypotheses were supported except functionality and perceived usefulness

							Information quality, functionality			
16	Huang, Backman, Backman & Moore (2013)	To investigate using TAM, tourists' experience and behavioural intention within a 3D tourism destination	USA	online survey	198, students and 3D users	SEM	Enjoyment, Positive emotion, Emotional involvement, Flow, Perceived ease of use, Perceived usefulness	Behavioural intention	TAM	Perceived ease of use and perceived usefulness positively influenced enjoyment. Positive emotion, emotional involvement and flow has positive and significant influence on behavioural intentions.
17	Kim, Kim & Shin (2009)	To examine the factors influencing the acceptance of airline B2C ecommerce websites	Republic of Korea	Online survey	495, Korean airline customers	SEM	Subjective norms, Attitude, eTrust, Perceived usefulness, Perceived ease of use	Intention	TAM	All hypotheses were supported.
18	Wen (2013)	To examine the impact of factors influencing travelers' attitude on online shopping intentions	USA	Online survey	560; American tourists	SEM	Perception of convenience, Perception of merchandise, Perception of Value, Shopping experience	Purchase Intention	TPB	Travelers have a more positive attitude toward travel portal websites than toward companies' branded websites in terms of perception of convenience, perception of merchandise and perception of value
19	Hosany & Prayag (2013)	To examine tourists emotional profiles and their post-consumption evaluations of satisfaction and intention to recommend	UK	Postal survey	520, English tourists	SEM	Joy, Love, Positive surprise, Unpleasantness,	Satisfaction, Intention to recommend	CNTT	Tourists who were delighted were seen to recommend the destination to others.
20	Lee & Cranage (2011)	To examine how privacy assurance affects personalization and the role it plays in influencing behavioural responses	USA	Experiment (website analysis)	120, undergraduate student	Analysis of variance (ANOVA) and Analysis of covariance (ANCOVA)	Perceived usefulness, Privacy concern, Personalization, Privacy assurance	Adoption intention, Self-Disclosure intention	Personalisation	Enhancing privacy assurance increases the perceived usefulness of services and decreases customer privacy concerns. Behavioural responses are positively related to the perceived usefulness of services
21	Chow & Murphy (2011)	To explore the predictive power of psychographic and demographic variables on intended and actual travel behaviours	China	Triangulation (Qual interviews); Face-to-face and survey	397, Chinese outbound tourists	Multiple regression	Sightseeing, Culture and heritage activity, Shopping and Dining and Entertainment	Intention and Actual travel behavior	Intend, Actual	Actual and intention to travel were influenced by sightseeing, culture and heritage activity, shopping and dining, and entertainment.
22	Chen & Kao (2010)	To investigate the effects	Taiwan	Face-to-face	240,	SEM	Process quality,	Behavioural	SERVQUAL	Tourists who are satisfied show

		of process quality, outcome quality, satisfaction and behavioural intentions on online travel agencies			Taiwanese tourists		Outcome quality	intention, Satisfaction		favourable behavioural intention towards the destination
23	Wu, Chiu, Yang & Li (2011)	To determine factors influencing tourism website usability	Taiwan	Face-to-face	256, Taiwanese tourists	SEM	Performance expectancy, Effort expectancy, Social Influence, Facilitating conditions, Behavioural intention	Use behavior	UTAUT	Performance expectancy, effort expectancy, social influence, facilitating conditions all influence behavioural intention. On the other hand, behavioural intention influences use behavior.
24	Martin & Herrero (2012)	To determine factors influencing users' psychological factors on online purchase intention	Spain	Face-to-face	1083, Spanish rural tourists	Regression analysis	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Innovativeness	Online purchase intention	UTAUT	Purchase intention depends on user performance and effort expected by the user. Also, the higher the innovativeness of the user the higher the purchase intention.
25	Escobar-Rodriguez & Carvajal-Trujillo (2014)	To determine factors influencing purchase of flights from low-cost carrier websites	Spain	Face-to-face	1096, Spanish travelers	SEM	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Price saving orientation, Habit, Innovativeness, Trust, Information quality, Perceived security, Perceived privacy, Behavioural intention	Use Behaviour	UTAUT	In order of importance, the predictors of online purchase intention are trust, habit, price saving, facilitating conditions, performance expectancy, effort expectancy, innovativeness, hedonic motivation and social influence.
26	Rasty, Chou & Feiz	To investigate the role of	Iran	Online survey	386, tourists	SEM	Internet travel	Purchase	ADC	Those who purchase travel

	(2013)	internet advertising design, tourists attitude and internet travel advertising effect on tourist's purchase intention			in Iran		advertising effect, Internet advertising attitude, Internet travel advertising content design, Involvement	intention		products are those who are highly involved. Also, Those who have positive internet ad attitude are found to have high purchase intention
27	Kucukusta, Law, Besbes & Legoherel (2015)	To investigate factors influencing Hong Kong online users' intention to book tourism products	Hong Kong	Face-to-face	213, Hong Kong online users	ANOVA, regression analysis	Perceived usefulness, Ease of use	Behavioural intention	TAM	Perceived usefulness is found to be more influential than ease of use in predicting intention to book for tourism products
28	Munoz-Leiva, Hernandez-Mendez & Sanchez-Fernandez (2012)	To investigate the factors influencing tourists' use behavior of travel 2.0 websites	Spain	Online survey	440, Spanish travel 2.0 website users	SEM	Trust, Usefulness, Attitude, Ease of use	Intention	TAM	Differences in website determines the behavior of the user
29	Hsu, Chang & Chen (2012)	The examine the impact of website quality on customer satisfaction and purchase intention	Taiwan	Online survey	534, Taiwanese tourists	SEM	Perceived playfulness, Perceived flow, Information quality, System quality, Service quality	Purchase intention, Customer satisfaction	SOR	Service quality is very important in predicting customer satisfaction and purchase intention
30	Kaplanidou & Vogt (2006)	To examine the role of website influencing travel intentions	USA	Online survey	2,342 American online travel buyers	SEM	Accessibility, Usefulness, Ease of navigation, content motivating visuals, Content trip info functionality	Intention	TAM	Website usefulness was an important factor in predicting online travel
31	Lee, Qu & Kim (2007)	To examine how online traveler decision-making is influenced by innovativeness	Republic of Korea	Online survey	235, South Korean travelers	SEM	Attitude, Subjective norm, Innovativeness	Intention	TRA	Highly innovative travelers were influenced by their positive attitudes
32	Kamarulzaman (2007)	To explore consumers' adoption of internet shopping on travel services	UK	Online survey	300 UK travel shoppers	SEM	Trust, Perceived risk, Perceived ease of use, Perceived usefulness, Innovativeness, Involvement, Opinion Leadership	Intention	TAM	Individual traits are important in perceived useful in adopting new technology

33	Wong & Law (2005)	To understand the factors influencing hotel bookers reservation of rooms through websites	Hong Kong	Omnibus survey (Face to face)	638 Hong Kong travelers	Regression analysis	Information quality, Sensitivity content, Time	Intention	Motivation	Information available on the website was important influencing hotel booking through website
34	Luque-Martinez et al (2007)	To explore the factors influencing the intentions to use internet to search for holiday information	Spain	Face to face	286 international tourists in Spain	SEM	Satisfaction, Attitude, Ease of use, Usefulness	Intention	TAM	The TAM model explicitly explains intentions but should be expanded to incorporate satisfaction on online context
35	Kim, Ma & Kim (2006)	To investigate the factors influencing Chinese online reservations intentions	China	Face to face	206 guests in a Chinese hotel	Regression analysis	Information needs, Service performance & reputation, Convenience, Price benefits, Technological inclination, Safety	Intention, e-Satisfaction	Customer satisfaction	Security and information were the most important consideration for booking a hotel through a website
36	Ryan & Rao (2008)	To investigate holiday users of internet ease of use, functionality and novelty of hotel websites	New Zealand	Face to face	440, International visitors to New Zealand	SEM	Secure system, Perceived ease of use, Perceived usefulness, Behaviour	Intention	TAM	Security is an important consideration on hotel booking
37	Jarvelainen (2007)	To investigate factors that influence consumers' online purchase of travel products in a secure environment	Finland	Online survey	1501 Finnish internet users	SEM	Perceived usefulness, Perceived ease of use, Prior online experience, Task ambiguity, Social environment	Intention	TAM, MRT, SIM	Perceived usefulness has a stronger effect on behavioural intention than perceived ease of use.
38	Chen (2007)	To examine the factors influencing online purchase of airline tickets	Taiwan	Face to face	355 free independent Taiwanese travelers	SEM	Attitude, Social support, Perceived confidence, compatibility, Relative advantage, Complexity, Peer Influence, External Influence, Perceived Capability	Intention	DTPB	Online purchase of tickets will continue to grow as users show positive attitude
39	Bai, Law & Wen (2008)	To test a conceptual model of website quality	China	Face to face	180 hotel guests	SEM	Functionality, Usability,	Intention	SERVQUAL	Website quality positively influences customer satisfaction

		on customer satisfaction and purchase intention					Customer satisfaction			and it in turn influences purchase intentions
40	Morosan & Jeong (2008)	To explore if the modified TAM can evaluate users evaluation of different channels of hotel online reservations	USA	Online	914, US students	SEM	Perceived usefulness, Perceived ease of use, Perceived playfulness, Attitude	Intention	TAM	Perceived usefulness was a strong predictor of attitude

Consumer adoption of social media in tourism (CASMT)

1	Filieri & McLeay (2013)	To investigate the behavioural consequences of e-wom	Italy	Online survey;	578; individuals	SEM	Product ranking, Information accuracy, Information quantity, Information relevance, Information value added, Information understanding, Information timeliness, Information completeness and Information adoption	Information Adoption	ELM	Central routes – information timeliness, information understandability, information relevance, information accuracy, value-added information and information completeness; and peripheral route – information quality, product ranking were all seen to predict tourist choice of destination
2	Parra-Lopez, Bulchand-Gidumal, Gutierrez-Tano & Diaz-Armas (2011)	To examine the factors that influence the use of social media to take travel online	Spain	Online survey	404, individuals who take travel online	SEM	Incentives on use and adoption (, Benefits of use, Costs of use	Intentions of using social media	INT	Intentions to use social media are directly influenced by the perceived benefits of that use (functional, psychological and hedonic and social); however, the costs do not significantly affect the predisposition to use such technologies. It is also shown that there is a series of incentives such as altruism, availability, individual predisposition or trust in the contributions of others which facilitate and promote the use of this type of technology when organizing and taking tourist trips
3	Book, Tanford, Montgomery & Love (2015)	To examine the role of price on online travel reviews	USA	Hand-delivered questionnaire	327, undergraduate students	MANCOVA, ANOVA	Customer reviews, Price, Dissonance,	Intention to purchase travel	CDT	Social influence had a strong effect on both resort evaluations and postdecision dissonance. Nonunanimous reviews reduced the prevailing valence of

									reviews, but increased dissonance. Price may not be the predominant influence on decisions, as previously thought.
4	Casalo, Flavian & Guinaliu (2010)	To investigate the factors influencing intention to participation in firm-hostel online travel communities	Spain	Online survey	456, online community members	SEM	Attitude, Subject norm, Perceived behavioural control, Perceived usefulness, Perceived ease of use, Identification	Intention to participate	TPB, TAM & SIT	Subjective norm was not supported. Attitude, perceived behavioural control, perceived usefulness, perceived ease of use were all supported.
5	Ayeh, Au & Law (2013)	To examine online traveller's perception of the credibility of User Generated Content	Singapore	Online survey	661, Singaporean tourists	SEM	Attitude, Trustworthiness, Expertise, Homophily	Intention	Source Credibility	There is significant support for the impact of source credibility perceptions on attitude. All hypothesis were supported
6	Wang (2011))	To investigate the factors influencing gastronomy blogs in predicting readers' intention to taste local food and beverages	Taiwan	online survey	329, bloggers	SEM	Inspiring taste desire, Forming taste awareness, Facilitating interpersonal interaction	Behavioural intention	e-WOM	Experiencing appeal, generating empathy, providing image, presenting guides, social influence and cybercommunity were positively related to behavioural intention. Delivering knowledge was not found to be positive.
7	Sparks, Perkins & Buckley (2013)	To examine the influence of online travel reviews on attitudes and purchase intentions	Australia	Online survey	537, Australian tourism online community members	SEM	Attitude, Quality belief, Trust, Utility, Corporate social responsibility	Purchase intention	ATT	Tourists treat specific information posted by customers as most useful and trustworthy. Their purchase intention is influenced by their attitude toward the resort and their belief in CSR
8	Ayeh, Au & Law (2013)	To investigate the factors influencing consumers' use of consumer-generated media for media planning	USA	Online survey	535, US tourists	SEM	Attitude, Perceived enjoyment, Perceived similarity, Perceived ease of use, Usefulness, Trustworthiness	Intention	TAM	Using control variables such as age, education, gender and internet usage frequency, it found that perceived enjoyment and ease of use have greater effects on CGM for travel planning.
9	Ku (2011)	To investigate the effect of virtual community on travel decision	Taiwan	Online survey	435, Taiwanese online forum users	SEM	Behavioural intention, Flow experience orientation, Perceived enjoyment, Perceived usefulness	Actual participation	TAM	Flow experience, perceived enjoyment are positively related to use the community. Also consumers behavioural intention influences their actual participation in the community
10	Chen, Shang & Li	To investigate the	Taiwan	Online survey	179,	SEM	Perceived	Intention to	e-WOM	Novelty, understandability and interest

	(2014)	characteristics of travel blogs that influences travel decisions.			Taiwanese students		enjoyment of blog, Novelty, Reliability, Understandability, Interestingness	visit		elements in a blog affect behavioural intention to visit
11	Jalilvand & Samiei (2012)	To investigate the impact of electronic WOM (eWOM) on a tourism destination choice	Iran	Face-to-face	296, inbound tourists in Iran	SEM	Attitude, Subjective norm, Perceived behavioural control, electronic word of mouth	Intention to travel	TPB	eWOM, attitude, subjective norm, perceived behavioural control, were found to positively influence attitudes towards visiting the destination.
12	Sparks & Browning (2011)	To investigate the effect of online reviews on hotel booking intentions and perception of trust	Australia	Online survey	5500, Australian tourists	ANOVA	Framing, Valence, Trust	Booking intention	eWOM	Consumers are influenced by negative reviews especially when are the reviews are negative
13	Hsiao, Lu & Lan (2013)	To determine how storytelling blogs affect readers' intention to adopt travel products	Taiwan	Online survey	368, Taiwanese	SEM	Attitude, Empathy, Perceived aesthetics, Narrative structure, Sell reference	Intention	TRA	Well-designed layout can effectively increase readers' intention and positive feelings.
14	Casalo, Flavian & Guinaliu (2011)	To investigate factors influencing tourists to follow online community information for travel planning	Spain	Online survey	456, online community members	SEM	Attitude, Perceived usefulness, Trust	Intention to follow advise	TAM	Travelers' attitude toward advise in an online community strongly influences intention
15	Zhao, Wang, Guo & Law (2015)	To investigate the impact of reviews on travelers' hotel booking intentions	China	Face-to-face and online survey	269, Chinese hotel bookers	Correlation, regression analyses	Usefulness of online reviews, Reviewer expertise, Timeliness of online reviews, Volume of online reviews, Positive online reviews, Negative online reviews, Comprehensiveness of online reviews	Booking intentions	eWOM	No relation between negative online reviews and booking intentions. Also, relation between positive reviews and booking intentions was not statistically significant
16	Wang (2015)	The investigate the influence of eWOM on outbound tourists' intention to visit a	China	Online survey	195, Chinese outbound travelers to Finland	SEM	Attitude, Argument quality, Source credibility	Intention	ELM, TPB	Attitude about the destination was influenced by eWOM

		destination							
17	Ho & Lee (2015)	To investigate the influence of travel blogs on purchase intention	Taiwan	Online survey	288, Taiwanese bloggers	SEM	e-Loyalty, Interactivity, e-Satisfaction, Information quality	Purchase intention	RQ	Information, e-trust, e-satisfaction, e-loyalty have influence on purchase intention
18	Lin (2007)	To examine the impact of online information quality features on the sustainability of virtual communities	Taiwan	Online survey	165, virtual community members	SEM	Sense of belonging Perceived usefulness, Perceived ease of use, Information quality, System quality, Service quality, Offline activities	Intention	TAM	Perceived usefulness, ease of use and offline activities are the determinants of sustainability in virtual communities.
19	Wu & Chang (2005)	To explore the factors that affect the experience of flow and how flow affects the transaction intentions of the community members	Taiwan	Online	286 online community members	SEM	(Flow)Enjoyment, Time distortion, Machine Interactivity, Person interactivity, Ability, Benevolence, Integrity, Predictability	Intention	FLOW	Interactivity and trust affect community members' relationship
20	Chung & Koo (2015)	To examine how social media influences travel information search from a value perspective	Republic of Korea	Online	695, Korean residents	SEM	Information reliability, Enjoyment, Complexity, Effort, Perceived value,	Usage	VAM	Social media use in travel information search has been perceived as benefits (information reliability & enjoyment) and sacrifices (complexity, perceived effort). All have been shown to affect travel information search. However, enjoyment makes direct effect on social media use.
21	Wang (2012)	To investigate the affective, cognitive and cyber-interactive elements influencing travel blog readers' behavioural intention to travel	China	Online survey	323, blog participants	SEM	Building affective images, Building cognitive images, Facilitating interpersonal interaction	Behavioural intention	eWOM	Travel blog participants' perception of destination image is a strong predictor of travel intention. Building affective images, cognitive images and facilitating interactions significantly influenced bloggers perception of destination images
22	Jalilvand, Samiei, Dini & Manzari (2012)	To examine the relationship between eWOM, destination	Iran	Face-to-face	264, international tourists in	SEM	Destination image, Attitude toward	Travel intention	e-WOM	eWOM positive influenced destination image, destination image and attitude positively influence travel intention

		image, tourist attitude and travel intention			Iran		destination, eWOM		

Consumer adoption of mobile information system in tourism (CAMIST)

1	Kim, Chung, Lee & Preis (2015)	To investigate how mobile tourism shopping influences continuous usage	Republic of Korea	Online survey	357; individuals	SEM	Perceived Usefulness, Site Attachment, Source Credibility, Argument Quality. Social Network Involvement (Moderator variable)	Continued Usage of Mobile Tourism Shopping	ELM	Perceived usefulness positively influences mobile tourism shopping as also site attachment was seen to positively influence mobile tourism shopping
2	Lai (2015)	To examine factors influencing use of mobile App for tourism use by extending the original UTAUT model	China	Interviewer-administered survey	205; residents	SEM	Performance expectance, Effort expectancy, Social influence, Facilitating conditions, Informativeness, Entertainment	Behavioural intention	UTAUT	Informativeness has the greatest impact on Behavioural intention to use AMTG. Also, PE, EE, SI and FC have all direct positive effect on BI
3	Chang, Chou, Yeh & Tseng (2016)	To examine the factors influencing usage intention of Taiwan Medical travel app	Taiwan	Self-administered survey	366; Chinese medical tourists	SEM	Attitude, Perceived behavioural control, App involvement Perceived ease of use, Perceived usefulness, social influence, E-wom, Mobile self efficiency	Usage intention	DTPB	The higher the behavioural control the higher the usage intention. When the PEOU & PU are high, usage intention would also be high
4	Okazaki & Hirose (2009)	To examine the factors affecting the use of mobile internet as a media source for travel decisions	Japan	Online survey	992, Japanese tourists	SEM	Attitude (traditional media, mobile internet, PC internet), Satisfaction (traditional media, mobile internet and PC internet)	Habitual Usage of mobile internet	GT, NT	Satisfaction from mobile internet and attitude towards mobile internet will be stronger for female than for male.
5	Chung, Koo & Kim	To investigate the impact	Republic of	Face-to-face	101,	SEM	Perceived	Behaviour	UDT	Escape, event attraction are significantly

	(2014)	of Booth Recommender System (BRS) service on usage behavior	Korea		exhibition visitors		usefulness, Threats to freedom of choice, Information gain, Escape, Event attraction			related to perceived usefulness while information was not significant. Perceived usefulness directly mediate on unplanned behavior
6	No & Kim (2014)	To examine determinants of intention to adopt smartphone for travel purposes	Republic of Korea	Online survey	400, travelers	SEM	Usefulness, Ease of use, Social influence, Satisfaction,	Intention to use smartphone	UTAUT	Usefulness, ease of use, social influence and satisfaction influence travelers' use of smartphone for travel planning
7	Kim, Park & Morrison (2008)	To examine the factors influencing the adoption of mobile technology in tourism	USA	Online survey	283, American travelers	SEM	Attitude, Perceived usefulness, Perceived ease of use, Technology experience, Trip experience	Intention to travel	TAM	Trip experience and technology experience positively influenced perceived performance and perceived ease of use.
8	Lu, Mao, Wang & Hu (2015)	To investigate factors that influence travel app adoption by tourists visiting rural tourism sites in China	China	Face-to-face	613	SEM	Self-efficacy, Performance outcome, Personal outcome (Information, Navigation, Marketing, Socialization, Safety, Entertainment, Transaction) Advantage, Compatibility, Complexity, Social norms	Intention to travel	TAM, IDT, SCT	PU, PEOU and compatibility were found to influence travel app adoption. However, compatibility was the best perception-based indicator of attitude to adopt travel app. in the SCT, performance outcome expectation were better; high expectation for transaction functions. Social norms did not have impact.

IDT – Innovation Diffusion Theory , TAM – Technology Acceptance Model; EUS – End-User Satisfaction; ELM – Elaboration Likelihood Model; TRA – Theory of Reasoned Action; TPB – Theory of Planned Behaviour; INT - Intentions to use social media; TCT – Transaction Cost Theory; CDT – Cognitive Dissonance Theory; ECM - Expectation Confirmation Model; DTPB – Decomposed Theory of Planned Behaviour; UTAUT – Unified Theory of Acceptance and Use of Technology; TTPT – Trust Transfer Process Theory; MGB – Model of Goal-Directed Behaviour; GT – Gender Theory; NT – Niche Theory, UDT – Unplanned Decision Theory; SOR – Stimulus-Organism Response framework; ATT – Attitude; CNTT – Cognitive-Normative Tourism Typology; SERVQUAL – Service quality model, ADC - Ad Design Content; RQ – Relationship Quality; WPI – Website Performance Index; MRT – Media Richness Theory; SIM – Social Influence Model; VAM – Value-based Adoption Model

Appendix II.

Author/year	Year of coverage	No. of articles reviewed	ICT domain/ area	Purpose and key findings
Frew (2000)	1980–1999	665	ICT application in tourism services	The review covered both ICT-related and non-ICT-related articles in tourism studies. Papers were segmented by scale, scope and sources, with the internet seen as potentially redefining the tourism industry in the near future
Leung and Law (2007)	1985–2004	55	ICT application in tourism services	Publications on networking were greater in number, with 1995–2004 seeing the highest publication
Buhalis and Law (2008)	1987–2007	149	ICT application in tourism services	Review of ICT studies in tourism. It found that e-tourism is focused on consumer-centric technologies that allow organizations to interact with their customers
Law et al. (2009)	2005–2007	215	ICT application in tourism services	Papers were categorized by consumer, technological and supplier perspectives. ICT was considered to play a dominant role in customer satisfaction
Law et al. (2010)	1996–2009	75	Tourism website	The study reviewed publications on website evaluation. It noted that the counting method of evaluating websites dominated these studies
Leung et al. (2013)	2007–2011	44	Social Media in tourism	Social media was considered very useful in customer engagement and retention
Pesonen (2013)	2000–2011	188	ICT & Market Segmentation in tourism	Using ICT in tourism services
Law et al. (2014)	2009–2013	107	ICT application in tourism services	Customer, technological and supplier perspectives were also reviewed, with user-generated content being the leading research topic
Singh (2015)	1981–2012	182	ICT application in tourism services	The study reviewed past publications on ICT in the Indian tourism sector. It found that, while ICT-related tourism studies are increasing, however, Indian universities need to conduct more research
Lu and Stepchenkova (2015)	No start date – 2013	122	Social media in tourism	The study surveyed publications on user-generated content and how they are analyzed. It found that data collection and analysis were common, as various publications deployed self-developed applications (SDA).
Zeng and Gerritsen (2014)	2007–2013	279	Social media in tourism	Research on social media in tourism is still in its infancy
Leung et al. (2015)	1996–2013	331	Internet marketing in tourism	Internet marketing research in tourism has gone through introduction, growth and maturity stages

Appendix III.

S/N	Journal
Tourism-based journals	
1	Tourism Management
2	International Journal of Hospitality Management
3	International Journal of Tourism Research
4	Journal of Hospitality and Tourism Research
5	Journal of Travel & Tourism Marketing
6	Journal of Travel Research
7	Current Issues in Tourism
8	International Journal of Contemporary Hospitality Management
9	Journal of Air Transport Management
10	Asia Pacific Journal of Tourism Research
11	International Journal of Hospitality & Tourism Administration
12	Journal of Destination Marketing & Management
13	Journal of Hospitality Marketing & Management
14	Journal of Hospitality & Tourism Technology
15	Journal of Vacation Marketing
16	Leisure Sciences
Non-tourism based journals	
1	Telematics and Informatics
2	Internet Research
3	Online Information Review
4	The Service Industries Journal
5	Computers in Human Behaviour
6	Asia Pacific Journal of Marketing & Logistics
7	Behaviour & Information Technology
8	Industrial Management and Data Systems
9	Information Systems and E-Business Management
10	International Journal of Retail & Distribution Management
11	Journal of Business Research
12	Journal of Statistics & Management Systems
13	Journal of Systems and Information Technology
14	Technological Forecasting & Social Change

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