Chapter 1
Thirty Years of Research on Application of Technology in Tourism and Hospitality Industry: A Systematic Literature Review

Mohammad Rokibul Hossain, Fahmida Akhter, Anukrati Sharma, and Azizul Hassan

Abstract In the fourth industrial revolution, the application or adoption of technology in the tourism and hospitality industry became mainstream and received significant attention from research scholars. But application of Systematic Literature Review (SLR) to elucidate the dynamics of technology in the tourism and hospitality industry has hardly been experimented in any prior research. Therefore, the literature gap pertaining to the nexus of technology and tourism industry is addressed in this chapter. Although the literature in tourism has extensively discussed technology application or adoption in tourism and hospitality industry, the research structure in this field remained scattered and fragmented. The current chapter is intended to bridge the gap and is attempted to achieve three goals. First, to understand the corpus of research on "Application and Adoption of technology in tourism and hospitality", SLR is conducted only based on research articles extracted from Web of Science and Scopus on the specified topic using some specific search strings to unfold the corpus of research on use and adoption of technology in tourism and hospitality industry. To conduct the SLR, the study adopts four bibliometric analysis process named-co-citation, network visualization through co-occurrence data, multi-dimensional scaling, and hierarchical cluster analysis that shed light on the intellectual structure on technology application in tourism industry. Second, the chapter illuminates on how the technology shape tourism in a new form. Third, the

M. R. Hossain (✉)
Faculty of Business Studies, Premier University, Chattogram, Bangladesh
e-mail: rokibul.fbs@puc.ac.bd

F. Akhter
School of Business Administration, East Delta University, Chattogram, Bangladesh

A. Sharma
Department of Commerce and Management, University of Kota, Kota, Rajasthan, India

A. Hassan
Tourism Consultants Network, The Tourism Society, London, UK

A. Hassan (ed.), *Technology Application in Tourism in Asia*,
https://doi.org/10.1007/978-981-16-5461-9_1

chapter delineates the models and theories that were addressed in the previous studies to describe how technology is applied and adopted in the tourism industry. The findings of the study help the researchers and academicians to understand the research trends in this area and how knowledge structure has been evolved over the years.

Keywords Technology · Tourism · Technology adoption · Smart tourism · Artificial Intelligence · Augmented Reality (AR) · Virtual Reality (VR) · Robochat

Introduction

The fourth industrial revolution focuses on the exponential growth of emerging technologies which triggers customer-centric revolution in modern tech-based tourism business. Technologies such as Robotics, Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR), Internet of Things (IoT), blockchain technology, fully automated vehicles, nano technology, quantum computing, fifth generation wireless technology and many other advanced technologies have affected the marketers' strategies and tourists' experience in tourism and hospitality industry (Car et al., 2019; Pencarelli, 2020). The rapid growth of information and communication technology, e-business platforms, digital marketing, social media marketing has effectively revolutionized the dynamics of tourism and hospitality industry (Herrero et al., 2018; Law et al., 2014; Moreno & Tejada, 2019). These technological advancement have brought unprecedented challenges and opportunities in operation, strategy setting, process innovation and process re-engineering throughout the industry (Law et al., 2014).The tourism and hospitality industry has been heavily revolutionized with the digital transformation and adoption of smart technologies (Law et al., 2014; Mariani, 2019). Companies operating under tourism industry are reaping benefits of technologies through improved customer experience by focusing on customers' preferences (Pappas et al., 2021). Technology can facilitate the tourism industries to improve the efficiency, productivity, maximum reach, visibility, traceability, value co-creation and co-innovation (Pappas et al., 2021; Pencarelli, 2020). Conversely, such technological solution can boost the customer experiences by combining tourism product and services (Stankov & Gretzel, 2020), allowing access for information and inter modular transportation or by shaping the physical environment around the customers (Chung et al., 2017; Pappas et al., 2021).

The revolutionary impact of technology has been foresighted significantly in most of the industries and business (Leung, 2020; Osei et al., 2020; Sigala & Gretzel, 2017). Unlike other industries, technology has transformed the tourism and hospitality landscape altering previous operational and managerial techniques with a new sophisticated business model (Ivanov et al., 2020). Extant literature on application/adoption of technology in tourism industry ushers that researchers have emphasized on different aspects of technology usage in tourism and hospitality industry. Scholars focused on use of robotics or automation in tourism industry

(Çakar & Aykol, 2020; Christou et al., 2020; de Kervenoael et al., 2020; Fusté-Forné, 2021; Hou et al., 2021; Ivkov et al., 2020; Kelly et al., 2019; Kim et al., 2021; Nam et al., 2020; Park, 2020; Zeng et al., 2020a, b; Zhong et al., 2020), Artificial Intelligence (Fusté-Forné, 2021; Kelly et al., 2019; Kim et al., 2021; Mingotto et al., 2020; Nam et al., 2020; Tuomi et al., 2020; Tussyadiah, 2020), smart tourism (Ivanov, 2019; Jeong & Shin, 2020; Lacka, 2020; Lerario & Varasano, 2020; Leung, 2019; Pai et al., 2020; Santos-Júnior et al., 2020; Shen et al., 2020a, b), Augmented Reality (AR) or Virtual Reality (Aluri, 2017; Bogicevic et al., 2019; Cranmer et al., 2020; Flavián et al., 2021; Han et al., 2019; Liang & Elliot, 2021; Jung et al., 2020; Kang, 2020; Kim et al., 2020; Kim & Hall, 2019; Lee et al., 2020; Lee & Kim, 2021; Lin et al., 2020; Lo & Cheng, 2020; Loureiro et al., 2020; Sun et al., 2021; Van et al., 2020; van Nuenen & Scarles, 2021; Walmsley & Kersten, 2020; Wei, 2019; Yuce et al., 2020; Yung et al., 2021; Yung & Khoo-Lattimore, 2019), use of digital platform or social media in tourism (Cheunkamon et al., 2020; Foroudi et al., 2020; Inversini & Masiero, 2014; Kovács et al., 2021; Kowalczyk-Anioł & Nowacki, 2020; Li et al., 2018; Li & Law, 2020; Lin et al., 2020; Mosweunyane et al., 2019; Munar & Jacobsen, 2014; Pateli et al., 2020; Sharmin et al., 2021; Shen et al., 2020a, b; Sigala, 2018; Singh & Srivastava, 2019; Sultan et al., 2021; Zhou et al., 2020), application of Blockchain in tourism (Bodkhe et al., 2020; Filimonau & Naumova, 2020; Kizildag et al., 2019; Nuryyev et al., 2020; Rashideh, 2020; Thees et al., 2020; Tyan et al., 2020), use of (ICT) Information and communication technology (Alabau-Montoya & Ruiz-Molina, 2020; Law et al., 2019; Xiang, 2018), mixed reality technology (Bae et al., 2020), mobile application (Briciu et al., 2020), application of Big Data in tourism and hospitality industry (Kubo et al., 2020; Li & Law, 2020; Rashideh, 2020; Stylos et al., 2021; Valls & Roca, 2021; Yallop & Seraphin, 2020; Zeng et al., 2020a, b; Zhang et al., 2020).

Previous studies on the application of technologies in tourism and hospitality usher that researches on this topic are diversified such as scholars addressed their research from tourists' perspective or service provider's perspective. It is evident that technology transformed the tourism and hospitality industry into a new paradigm. Although some of the studies have conducted review to the tourist's perception on adoption of technology or firms challenges to adopt new business model but very few studies have addressed the technological impact in tourism industry from particular aspects only such as innovation research in hospitality and tourism (Lelo de Larrea et al., 2021); mobile technology (Law et al., 2018); technology adoption in fourth industrial revolution (Osei et al., 2020); tourism forecasting with internet data (Li et al., 2021); automation in tourism (Tussyadiah, 2020); use of ICT in restaurant (Moreno & Tejada, 2019), use of Blockchain (Bodkhe et al., 2020); adoption of user generated content (Ukpabi & Karjaluoto, 2018) and use of AR or VR in tourism industry (Loureiro et al., 2020; Wei, 2019).

Numerous studies have been investigated focusing exclusively on tourism industry practices or embracement of any particular technology in Tourism Industry. But, till the date, the field of Tourism research lacks to delineate a complete picture, where all the fourth revolution technologies will be enlightened in a single frame for their impact in tourism and hospitality industry through SLR. Furthermore, there is

a dearth of knowledge that how technology alter the tourists' travel experience and tourism service providers' business strategy with new business model. Therefore, the present chapter is intended for systematic and quantitative evaluation of the past and present technology application research in tourism and hospitality industry for assessing the potential contributions of this flourishing research domain. This chapter answers two questions: first, what is the knowledge structure of technology adoption in tourism and hospitality industry?; second, how does technology impact tourism and hospitality industry?

By adopting SLR approach, the chapter contributes to the existing literature in some ways. First, the chapter provides a comprehensive research overview of the domain of technology adoption in tourism and hospitality industry over the last thirty years. To fulfill this research objectives, the study is carried out by extensive literature survey using different renowned database like Scopus, Science Direct, and web of Science. The systematic reviews "summarize in an explicit way what is known and not known about a specific practice related question" (Briner & Denyer, 2009, p. 19). The value of SLR can provide a clear understanding of the current state of the research regarding the topic being investigated in a single platform. Considering the knowledge expansion in this domain over the years, the target of this chapter is to present a comprehensive overview of the research conducted in the domain of technology adoption in tourism and hospitality industry and its reflection in literature. The chapter attempted to explore the historical basis of technology adoption in tourism and hospitality domain. In general, as past and present studies influenced future research, this chapter helps the academician and practitioner to understand the trends of technological impact on tourism and hospitality industry in details.

Section 1.2 of this chapter presents the methodology used for SLR including data collection mechanisms from the publication database, the screening process and the data selection process. Section 1.3 and section 4 delineates the descriptive and thematic analysis respectively. The rest of the part is dedicated to conclusion and managerial and theoretical implication of this study.

Methods of Systematic Literature Review (SLR)

The study adopts SLR as it ensures the most efficient and high quality approach for exploring and evaluating extensive literature (Tranfield et al., 2003). SLR is used to evaluate and interpret the all-available research in a specific research area or phenomenon of interest where literature review can strengthen the foundation of research in a field of interest. SLR is a more authentic and verifiable source which incorporates a more comprehensive and unbiased search. According to Liliani et al. (2020), SLR establishes a defined procedure, and follows a strict review protocol to reduce researcher bias, and maintains the research process's independence, while permitting exploration and discovery that aids in the development of knowledge. The basic difference between traditional narrative review and SLR exists is

comprehensive and unbiased search (Tranfield et al., 2003). Extensive literature survey ushers that articles based on SLR can be in different forms such as Structured review articles with discussion on methods, theories discussed constructs that were used by the previous researchers and contexts and conditions of the study (Paul & Singh, 2017; Canabal & White, 2008); Conceptual framework based papers with further research directions (Paul & Criado, 2020), theoretical review paper (Paul & Rosad-Serrano, 2019), meta-analysis (Knoll & Matthes, 2017), bibliometric review (Randhawa et al., 2016). The study deploys SLR process consisting of data collection, data analysis and theme exploration using co-word analysis following the guidelines of Tranfield et al. (2003) and some extensively cited review articles (Rosad-Serrano et al., 2018; Keupp & Gassmann, 2009; Canabal & White, 2008).

Data Collection for SLR

The data collection for this study was carried out following the protocol as management review protocol is widely used to explore, discover and develop any research area by providing flexibility to the researchers to modify through the course of study, whilst it also ensure that reviews are less open to researcher's bias (Tranfield et al., 2003). The data collection protocol used in this study includes a rigorous search strategy with some specific criterion for inclusion and exclusion of the articles to fulfill the objective of Systematic literature review. The search strategy incorporates some relevant steps such as identification and selection of relevant keywords and search terms, selection of database for searching the articles, further modification of keywords and applying search strategy (Liliani et al., 2020; Tranfield et al., 2003).

Data Searching Strategy

The study used Scopus and Web of Science for extracting dataset to get relevant research papers on "Adoption or Application of Technology in Tourism and Hospitality industry". We used both Scopus and Web of Science as these are the reliable and widely accepted database and includes a wide range of peer reviewed journals in Business, Economics and management (Anees-Ur-Rehman et al., 2016; Foroudi et al., 2021; Fouroudi et al., 2020; Paul & Feliciano-Cestero, 2020). The search strategy deploys Boolean operators which includes some simple words (AND, OR, NOT or AND NOT) widely used to narrow or expand the search combining the keywords and search terms (Galvan & Galvan, 2017). Using Boolean operators in search produces a more usable search result, yet to saves time and efforts (Galvan & Galvan, 2017). The study employed some additional criterion in searching strategy to limit the results to peer reviewed academic articles within the selected databases. The reviewers have narrowed the datasets following some

restrictions criterion. First, the search was limited to the publications which were peer reviewed articles. Second, the search was done only within the domain of application of technology in Tourism and Hospitality Management and with the selected search strings such as Technology) OR (Augmented Reality) OR Virtual Reality OR Artificial Intelligence OR Big data OR ICT OR Social Media" AND "Tourism OR Hospitality OR Tourist Experience". Third, the reviewers attempted to extract only articles which were published in scholarly journals in the selected domains. Fourth, the search was limited to English articles in all databases. Five, we screened all the abstracts of papers to decide on the contents of the articles that ultimacy helped to exclude some irrelevant articles. Finally, the data set was extracted from the database considering the relevance and context of the study and their connection with the research objectives. Initially search in different debases presented different amount publications such as Scopus 4441, web of science 323. After applying all selection criterion, we could finally select 989 from Scopus and 123 from web of science (Table 1.1).

Selection of Articles

Study selection or article selection from selected database refers to identification and selection of primary studies those are directly connected with research questions and objectives (Kitchenham & Charters, 2007). To reduce the bias and human error (Tranfield et al., 2003), the study adopted a systematic protocol that includes deciding on selection criteria, extraction methods, sorting duplicate articles among the databases, and selection of study based on title, abstract and keywords (Liliani et al., 2020; Tranfield et al., 2003). In this stage, the reviewers have gone through a rigorous process to select the most relevant articles to meet the objective of the study. After collection data from different data bases, the reviewers have gone through the full articles before inclusion and exclusion decision. In these circumstances, the writers debated and agreed on the decision to include or exclude. After deciding on conflicting and confusing articles, the finally selected articles were moved to a spreadsheet to filter the duplication of articles among the databases. After final section of articles from different databases, all the articles were moved to the spreadsheet of Scopus which directly imported from Scopus for further analysis through the VOSviewer. Two reviewers sincerely cheeked the title, keywords, and abstracts of all selected papers to ensure relevance of the papers with the objectives

Table 1.1 Search strings for this research

Search strings
Technology related words: (Technology) OR (Augmented Reality) OR Virtual Reality OR Artificial Intelligence OR Big data OR ICT OR Social Media
Tourism and Hospitality related Words: Tourism OR Hospitality OR Tourist Experience

Source: developed by the authors, 2021

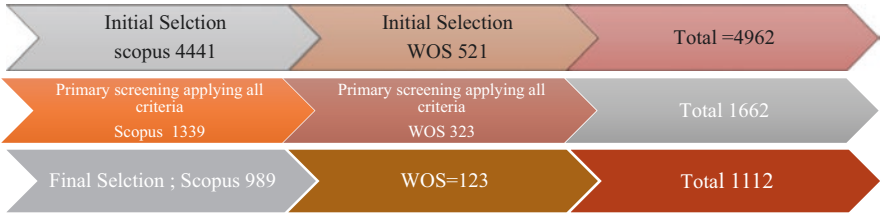

Fig. 1.1 The data collection and selection protocol. (Source: developed by the authors, 2021)

of the study. In selection through the title, the reviewers have focused on those papers that addressed the Technology and Tourism or Hospitality in the title of the papers. Next, keywords were reviewed ensure unification and consistency (i.e., singular/plural). In the full-text selection, all of the articles were read carefully focusing on Application of technology in Tourism Industry.

The application of data collection protocol, procedures of selection, and assessment criterion are depicted in Fig. 1.1.

Merging Scopus and Web of Science Data and Removing Duplicates

After extracting the data from Scopus and Web of science, the data were merged to perform bibliometric analysis. We adopted PRISMA method for inclusion and exclusion of articles for this study. Using search strings, articles related to application of technology in tourism and hospitality were extracted from Scopus and Web of Science in bib text format. Extracted data set were compiled using text maker software, and two separate datasets were constructed for the analysis using R studio. Initially we converted both files into bibliographic framework. Then, data set for web of science was merged into Scopus data set and duplicates were removed through R programming.

Data Analysis Tools

The data analysis using SLR is conducted through descriptive analysis and thematic analysis after retrieving the data through different appraisal mechanism (Liliani et al., 2020). In the first part of the data analysis, the descriptive analysis is presented. According to (Tranfield et al., 2003) the descriptive analysis is used in SLR to depict the profile of the selected articles using some categories and classification scheme. The classification scheme is done based on the published articles and it categorizes the total articles into different segments like circulation of published articles in different journals, contexts, time periods, and countries; reports

numerous policies and strategies for crisis period suggested by earlier studies; presents a set of theoretical standpoints within which those studies are explored. The second part of the analysis ushers some relevant theme. To explore the theme , the study uses Co-word analysis which is similar to the content analysis (Muñoz-Leiva et al., 2012) using the final data set. Co-word analysis has been applied as text mining to the articles' titles, abstracts, and keywords (van Eck & Waltman, 2010). Using the VOSviewer software, the data set is analyzed to find the relevant themes. Multiple keywords that appear together in the same article are identified by co-word connections. The number of articles in which the keywords appear together determines the link between them (van Eck & Waltman, 2010). The interpretative approach was utilised to extract data from the collection and discover consensus or emerging topics in the thematic analysis (Tranfield et al., 2003). Plainly, this uses two analysis software like R programming and VOSviewer to analyze the extracted data.

Analysis Phase

The data set to carry out the bibliometric analysis has been prepared by merging the extracted data from Scopus and Web of Science (WoS) databases through R. Scopus and Web of science are more reliable, prestigious and widely accepted data base for the bibliometric studies (Aria & Cuccurullo, 2017; Foroudi et al., 2021; Fouroudi et al., 2020; Rey-Martí et al., 2016). Table 1.2 indicates the data information that are used in the bibliometric analysis. Figure 1.1 reveals years wise distribution of journal from 1991 to 2021 within the 30 years. The inclusion or research paper in 1991 reveals that application of technology in tourism is a mature topic in the tourism literature as scholars have focused the necessity of technology in tourism in 1991. Figure 1.2 also indicates that interest of scholars in research of application of technology in tourism and hospitality is increasing dramatically from last 5 years. The exponential growth of researchers' interest on this topic has resulted highest number of articles such as 102,99,197 and 217 in the year of 2017, 2018, 2019, 2020, respectively.

Bibliographic Coupling

In bibliographical coupling, two publications that refer to the same document are matched because they have a lot of shared references. It implies that the main publications have a lot of intellectual capital in common (Woerner & Wixom, 2015; Khanra et al., 2021; Shin & Perdue, 2019). Table 1.2 shows the most contributing authors, journals, organizations and countries in the sample of current based on the bibliographic coupling on the selected database. Table 1.2 reveals most 20

Table 1.2 Information on merged database

Description	Results
Main information about data	
Timespan	1991:2021
Sources (journals) Scopus and web of science	116
Documents	1184
Average years from publication	5.53
Average citations per documents	27.09
Average citations per year per doc	3.565
References	57692
Document types	
Article	1120
Document contents	
Keywords plus (id)	2179
Author's keywords (de)	3590
Authors	
Authors	2483
Author appearances	3255
Authors of single-authored documents	213
Authors of multi-authored documents	2270
Authors collaboration	
Single-authored documents	228
Documents per author	0.477
Authors per document	2.1
Co-authors per documents	2.75
Collaboration index	2.37

Source: developed by the authors using R Studio, 2021

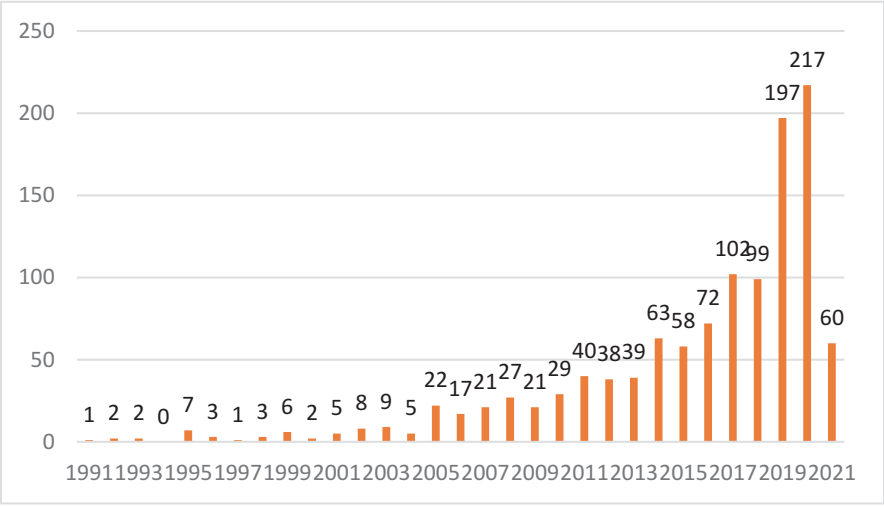

Fig. 1.2 Evolution of research in application of technology in tourism. (Source: developed by the authors using R Studio, 2021)

contributing authors, journals, countries and authors' affiliation in terms of producing articles over the years.

Citation Analysis

After merging the data using R programming, we have analyzed the dataset to identify widely cited paper in technology and tourism area. We focused on the citation analysis because an in-depth analysis of authors' citation provides a basic idea regarding the knowledge structure (Foroudi et al., 2021; Paul & Feliciano-Cestero, 2020) in technology and tourism research. We considered the total number of citations to select widely cited paper in this area. Table 1.3 and Fig. 1.3 indicated the highly cited paper. The analysis shows that the mostly cited paper focused on the progress of information technology in tourism sector (Table 1.4).

Prestige Analysis

The influence and popularity of contributors to a publication as reported by bibliographic coupling and citation analyses, respectively, may not reflect its prestige ((Khanra et al., 2020). An enhanced PageRank algorithm can be used to investigate the prestige of publications (Khanra et al., 2020). Using an enhanced version of the PageRank algorithm, this technique identifies articles that are important in shaping a research domain (Khanra et al., 2020). This algorithm gives high priority to publications that have been cited by well-known publications (Khanra et al., 2021). Table 1.5 shows the top prestigious articles from a sample of 1181 articles that were identified and ranked according to their PageRank Score.

Co-authorship Analysis

Co-authorship analysis provides valuable insight into the collaborative networks that form the intellectual capital of a research subject (Khanra et al., 2020). The propensity of a group of coauthors to cite specific publications may have an effect on the literature on a particular topic (Caviggioli & Ughetto, 2019; Khanra et al., 2021).

Table 1.3 Top 20 contributing authors, journals, countries and authors' affiliation in terms of producing articles over the years

Authors	Articles	Affiliations	Articles	Sources	Articles	Country	Articles	Country	Total citations
Law r	23	Kyung Hee university	44	Sustainability	118	China	127	United Kingdom	5722
Buhalis d	21	The Hong Kong Polytechnic university	32	Tourism management	109	USA	125	USA	5686
Gretzel u	17	Bournemouth university	26	Tourism economics	56	Spain	109	Spain	2604
Chung n	16	University of surrey	25	Current issues in tourism	49	United kingdom	96	China	1801
Fesenmaier d	13	Hong Kong Polytech university	18	Journal of sustainable tourism	48	Australia	54	Australia	1748
Jung t	12	Temple university	15	Annals of tourism research	44	Korea	54	Denmark	1510
Wang y	10	Manchester metropolitan university	14	Journal of hospitality and tourism technology	44	Italy	36	Canada	1311
Xiang z	10	Hong Kong polytechnic university	11	Journal of travel research	40	Hong Kong	28	Korea	1242
Gosling s	8	University of central Florida	11	Asia pacific journal of tourism research	36	India	25	Italy	898
Kim j	8	University of Queensland	11	African journal of hospitality tourism and leisure	33	Austria	19	Hong Kong	834
Kumar r	8	University of Tasmania	11	Journal of environmental management and tourism	33	South Africa	17	Greece	666
Tussyadiah i	8	University of Johannesburg	10	International journal of contemporary H&M	27	Greece	15	Sweden	545
Chen y	7	Modul university Vienna	9	International journal of tourism research	25	Malaysia	15	Austria	488

(continued)

Table 1.3 (continued)

Authors	Articles	Affiliations	Articles	Sources	Articles	Country	Articles	Country	Total citations
Filimonau v	7	Texas a and m university	9	Journal of travel and tourism marketing	24	Canada	14	Portugal	448
Lee s	7	University of Granada	9	Worldwide hospitality and tourism themes	24	Denmark	11	New Zealand	338
Tom d m	7	University of the south pacific	9	Information technology and tourism	23	Portugal	11	France	271
Yeoman i	7	Not reported	8	E-review of tourism research	21	Norway	10	Finland	217
Bulchand-gidumal j	6	University of Innsbruck	8	Tourism recreation research	20	Thailand	10	Turkey	179
Hardy a	6	Florida state university	7	Journal of tourism futures	16	Turkey	10	Malaysia	162
Kim m	6	Griffith university	7	Journal of destination marketing and management	15	Finland	9	Norway	144

Source: developed by the authors using R Studio, 2021

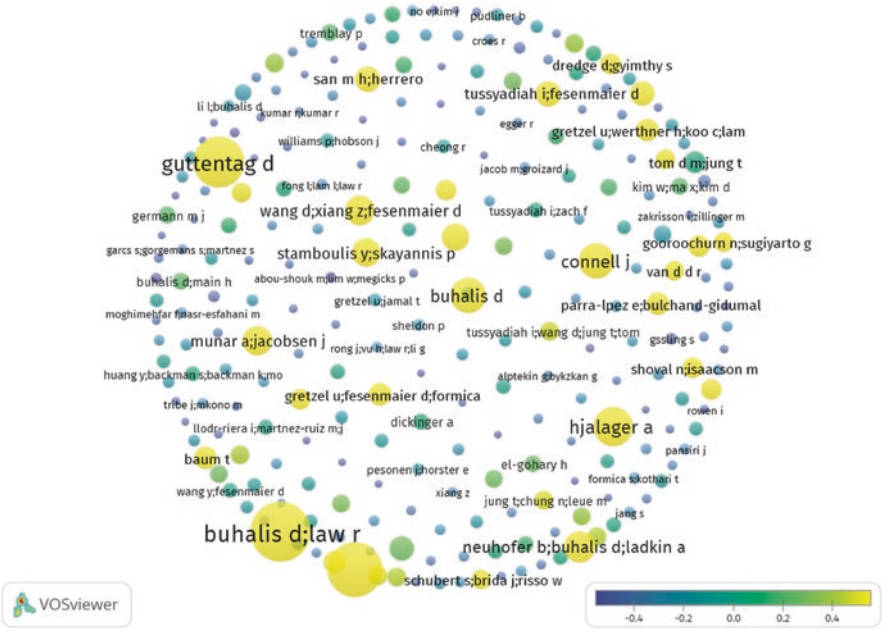

Fig. 1.3 Citation analysis of the author. (Source: developed by the authors using VOSviewer, 2021)

Table 1.4 Mostly cited paper focused on the progress of information technology in tourism sector

Author	Title	Journal information	Total citation	Py
Buhalis d; Law r	Progress in information technology and tourism management 20 years on and 10 years after the internet the state of tourism research	Tour. Manage.	1482	2008
Litvin s; Goldsmith r; Pan b	Electronic word of mouth in hospitality and tourism management	Tour. Manage.	1278	2008
Guttentag d	Airbnb disruptive innovation and the rise of an informal tourism accommodation sector	Curr. Issues tour.	671	2015
Hjalager a	A review of innovation research in tourism	Tour. Manage.	640	2010
Connell j	Medical tourism sea sun sand and surgery	Tour. Manage.	523	2006
Buhalis d	Strategic use of information technologies in the tourism industry	Tour. Manage.	489	1998
Guttentag d	Virtual reality applications and implications for tourism	Tour. Manage.	420	2010

(continued)

Table 1.4 (continued)

Author	Title	Journal information	Total citation	Py
Munar a; Jacobsen j	Motivations for sharing tourism experiences through social media	Tourism manage.	370	2014
Stamboulis y; Skayannis p	Innovation strategies and technology for experience-based tourism	Tour. Manage.	351	2003
Buhalis d; Licata m	The future E tourism intermediaries	Tour. Manage.	321	2002
Tussyadiah i; Fesenmaier d	Mediating tourist experiences access to places via shared videos	Ann. Tour. Res.	288	2009
San m h; Herrero	Influence of the users psychological factors on the online purchase intention in rural tourism integrating innovativeness to the UTAUT framework	Tour. Manage.	269	2012
Law r; Buhalis d; Cobanoglu c	Progress on information and communication technologies in hospitality and tourism	Int. J. Contemp. Hosp. Manag.	265	2014
Gretzel u; Fesenmaier d; Formica s; O'leary j	Searching for the future challenges faced by destination marketing organizations	J. Travel res.	226	2006
Gretzel u; Werthner h; Koo c; Lamsfus c	Conceptual foundations for understanding smart tourism ecosystems	Comput. Hum. Behav.	221	2015
Doolin b; Burgess l; Cooper j	Evaluating the use of the web for tourism marketing a case study from New Zealand	Tour. Manage.	219	2002
Baum t	Human resources in tourism still waiting for change	Tour. Manage.	214	2007
Parra-lpez e; Bulchand-gidumal j; Gutirrez-tao d; Daz-armas r	Intentions to use social media in organizing and taking vacation trips	Comput. Hum. Behav.	212	2011
Wang d; Xiang z; Fesenmaier d	Smartphone use in everyday life and travel	J. Travel res.	211	2016
Amaro s; Duarte p	An integrative model of consumers intentions to purchase travel online	Tour. Manage.	208	2015
Neuhofer b; Buhalis d; Ladkin a	A typology of technology enhanced tourism experiences	Int. J. Tour. Res.	208	2014
Neuhofer b; Buhalis d; Ladkin a	Conceptualizing technology enhanced destination experiences	J. Destin. Mark. Manage.	204	2012
Orfila-sintes f; Cresp-cladera r; Martnez-ros e	Innovation activity in the hotel industry evidence from Balearic islands	Tour. Manage.	201	2005

Source: developed by the authors using R Studio, 2021

Table 1.5 Top ten contributor based on prestige analysis

Node	Betweenness	Closeness	PageRank
(Herrero et al., 2018)-1	612.7688	0.004184	0.024044
Springer: cham	21.29733	0.003279	0.003759
Gretzel u. 2015-2	135.8345	0.003731	0.015747
Buhalis d. 2008-1	205.5454	0.003984	0.012243
Law r. 2014	152.7629	0.003846	0.011183
Boes k. 2016	72.13817	0.003623	0.010164
Buhalis d. 2015-1	121.6945	0.003704	0.010583
Buhalis d. 2014	12.20186	0.003509	0.008265
Neuhofer b. 2012	89.67146	0.003717	0.011339
Buhalis d. 2015-2	244.3287	0.003774	0.010022
Huang c.d. 2017	67.9046	0.003534	0.009305
Gretzel u. 2011	38.79852	0.003636	0.008219

Source: developed by the authors using R Studio, 2021

Co-citation Analysis

It is known that citing or refereeing a pair of publication by two articles is considered as co-cited (Xu et al., 2018). Research papers which are often cited by other articles mostly discuss on similar topic (Hjørland, 2013). According to Hjørland (2013: p. 1314), in bibliometric analysis we use citation and co-citation indexes based on the assumption that "there are (normally) subject relations and semantic relations between citing and cited documents". Co citation is considered as a method of exploratory data analysis (EDA) through which we can explore the data structure (Xu et al., 2018). Using the bibliometric package in R programming co-citation analysis was performed. Figures 1.4, 1.5, 1.6, and 1.7 present the co-citation map which is randomly generated by the software. The map represents 4 different clusters. Articles belonging to each cluster are connected to each other based on the theme of the articles. After extracting the data from Scopus and web of science, we merged the both data set and converted Web of science data into Scopus data frame using R software. In this previous section, we performed citation analysis using citation frequency to identify the highly cited paper (Samiee et al., 2015). We performed the co citation analysis based on Multi-dimensional scaling (MDS) method because MDS provides opportunity to researchers to screen the intellectual structure of the domain on which they are conducting the research (Foroudi et al., 2021; Samiee et al., 2015). In accordance with suggestions of researchers (Foroudi et al., 2021; Samiee et al., 2015), we conducted co-citation analysis to configure intellectual structure of research in technology and tourism research .The resulting co-citation map fragmented the total data set into four

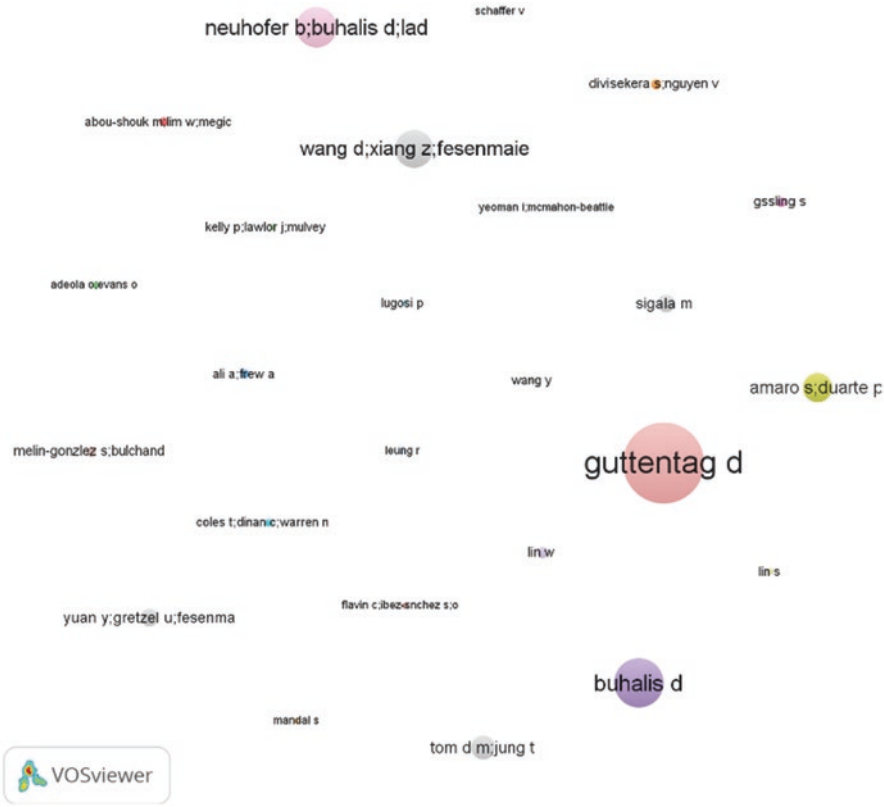

Fig. 1.4 Network of authors from co-authorship analysis*. * minimum publications = 3; minimum citations = 10. (Source: developed by the authors using VOSviewer, 2021)

clusters. The clusters produced by the R programming indicates that papers within one cluster related to same theme. Extensive survey on these clusters ushers that clusters are all related to technology and tourism and focused on some specific domain (Table 1.6).

Thematic Synthesis of Technology and Tourism Research through Co-word Analysis

Co-word Analysis

A co-word analysis is a kind of content analysis (Kassarjian, 1977; Muñoz-Leiva et al., 2012). Co-word analysis converts a large number of descriptors (or keywords) to a collection of network graphs that effectively depict the strongest relationships

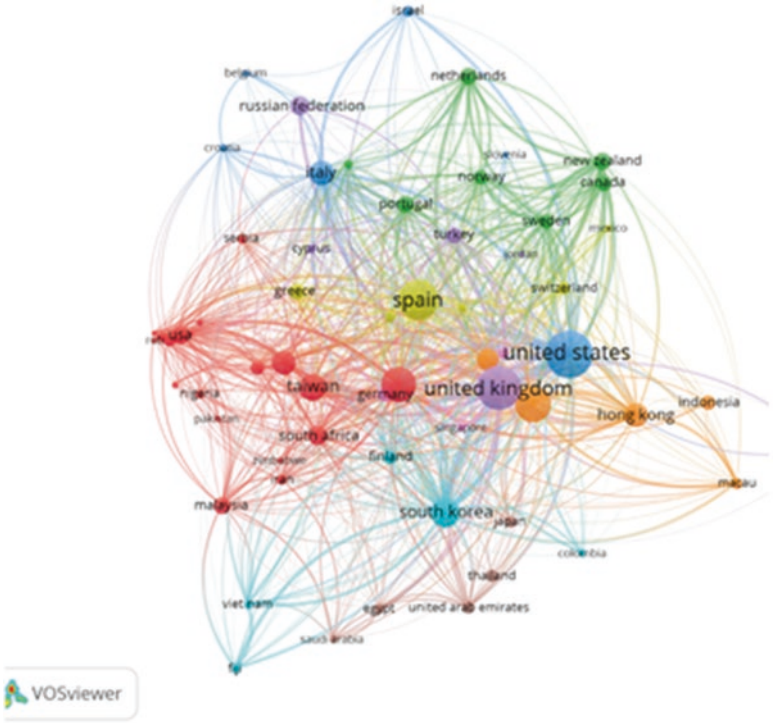

Fig. 1.5 Network of authors from coauthorship analysis*. * minimum publications = 3; minimum citations = 10. (Source: developed by the authors using VOSviewer, 2021)

between them. To detect the theme , the study adopts the guidelines of (He, 1999). The exploration of themes through the co-word analysis goes through some consecutive steps such as (1) raw data collection (2) selection of item types to analyze, (3) relevant information's extraction from the raw data, (4) similarity calculation between items on the basis extracted information, and (5) a clustering algorithm use for detecting the themes. The study analyses the authors' keywords and indexed keywords. Although (Courtial et al., 1993) initially proposed the co-word analysis method from detecting and representing the relationship between concepts from the selected research articles but later, many other authors like (He, 1999) used the co word analysis for theme detection from textual data. Co-word analysis is used to uncover themes within a specific field of study, as well as relationships between them, their relevance to a larger region, and the degree to which they are internally structured (Muñoz-Leiva et al., 2012). Conceptualization of research topic can be derived from the analysis of co-occurrences of keywords (Fahimnia et al., 2015). Co-word in the current study is performed using authors keywords and indexed keywords.

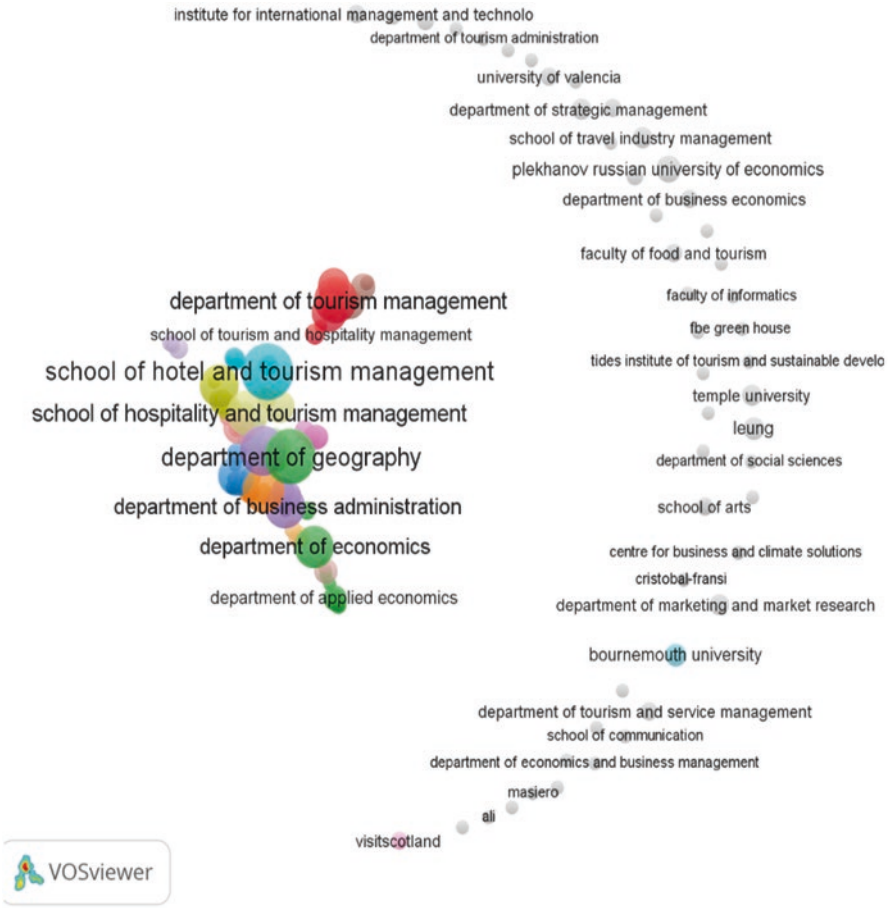

Fig. 1.6 Network of authors from coauthorship analysis*. * minimum publications = 3; minimum citations = 10. Network of authors from co-authorship analysis*. * minimum publications = 3; minimum citations = 10 (source: developed by the authors using VOSviewer, 2021)

This section explores the themes and research domain on technology application in tourism and hospitality industry. Along with quantitative approach to classify the literature review, we focus on the exploration of themes on that topic using authors' keyword and keywords plus and visualizing those themes with the help of VOSviewer software (see www.vosviewer.com) (van Eck & Waltman, 2016; Foroudi et al., 2021). According to van Eck and Waltman (2016), and Foroudi et al. (2021), network visualization is a powerful and cutting edge method for representing the graphical representation of bibliometric analyses, enabling researchers to better understand and visualize the study domain. Using the text mining capabilities of VOSviewer software, we built a term map based on co-occurrence data in the most widely cited publication on technology in tourism and hospitality

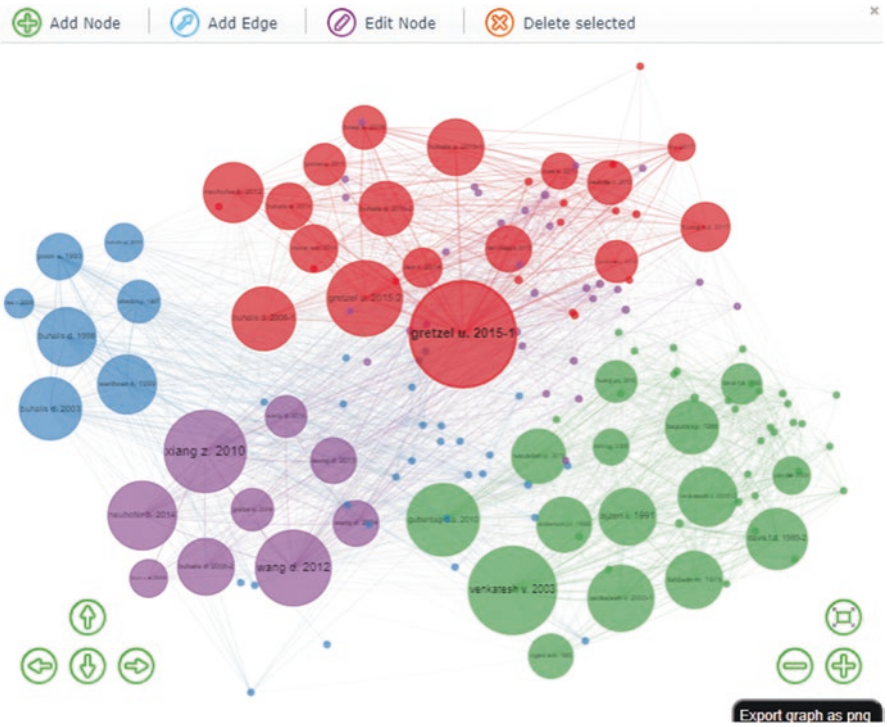

Fig. 1.7 Co-citation Network based on author and MDS. (Source: developed by the authors using VOSviewer, 2021)

(see Fig. 1.8). Researchers can use the co-occurrence map to interpret study topics within a research domain, with the size of the circles indicating how many citations each keyword has received. Since closely related keywords in the same color are more likely to be related, they display a stronger correlation. According to Fig. 1.8, the most highly used keywords in this sample of this study are technology (82) times, Smart Tourism (66), ICT (54), Internet (51), Innovation (42), Social Media (46), Virtual Reality (34), Augmented Reality (30), E-tourism (46). Figure 1.8 and Table 1.7 usher that the keywords are segregated into different clusters. Keywords are that close and related are having stronger association among those keywords which have been visualized in the same color in the graph. Cindering the density of the keywords the followings' themes have been explored.

Smart Tourism

Smart tourism is a novel approach dealing with new realities in tourism brought about by the effect of innovative information and communication technologies (ICTs) on destinations, travelers, and businesses (Tyan et al., 2020). According to

Table 1.6 Cluster analysis based on co-citation network following MDS method

Node	Cluster	Pagerank	Node	Cluster	Pagerank
Herrero et al. (2018)	1	0.024044	Venkatesh and Bala (2012)	3	0.018492
Gretzel et al. (2015)	1	0.015747	Herrero et al. (2018)	3	0.015123
MichopoulouandBuhalis(2008)-	1	0.012243	Guttentag (2010)	3	0.012849
Law et al. (2014)	1	0.011183	Fishbein (1975)	3	0.010229
Boes et al. (2016)	1	0.010164	Rogers e.m. 1995	3	0.007232
Buhalis and Amaranggana (2015)	1	0.010583	Venkatesh v. 2000-1	3	0.010642
Mistilis et al. (2014)	1	0.008265	Anderson j.c. 1988	3	0.008268
Neuhofer et al. (2012)	1	0.011339	Bagozzi r.p. 1988	3	0.009579
Buhalis and Amaranggana (2015)	1	0.010022	Tussyadiah i.p. 2018	3	0.008416
Gretzel (2011)	1	0.008219	Chin w.w. 1998	3	0.005967
Munar and Jacobsen (2014)	1	0.008325	Venkatesh v. 2000-2	3	0.009244
Li et al. (2017)	1	0.008934	Wang d. 2012	4	0.024481
Buhalis (2003)	2	0.013694	Neuhofer b. 2014	4	0.014071
Buhalis and Main (1998)	2	0.013521	Wang d. 2014	4	0.010374
Poon (1993)	2	0.011727	Buhalis d. 2008-2	4	0.01076
Werthner and Klein (1999)	2	0.011627	Leung d. 2013	4	0.009938
Buhalis (2000)	2	0.006937	Wang d. 2016	4	0.009051
Sheldon (1997)	2	0.009018	Litvin s.w. 2008	4	0.006511
Law et al. (2010)	2	0.006142	Urry j. 1990	4	0.004367
Buhalis and Kaldis (2008)	2	0.003272	Wang n. 1999	4	0.005294
Hopken et al. (2009)	2	0.007401	Gretzel u. 2009	4	0.008536
Sheldon (1997)	2	0.00381	Mackay k. 2012	4	0.006028
Lin and Fu (2012)	2	0.005644	Hays s. 2013	4	0.005568
Doolin et al. (2002)	2	0.004671	Kaplan a.m. 2010	4	0.0035

Source: developed by the authors using R Studio, 2021

Pencarelli (2020), the term "Smart Tourism" refers to the efficient and effective use of technological, human, and social resources for pursuing sustainability principles to improve people's quality of life in smart tourist locations while also increasing customers' tourist experiences. The Smart Tourism destinations are places that use available technology to co-create value, pleasure, and experiences for visitors while also providing benefits and income to tourism organizations and destinations. Furthermore, the literature on Smart Tourism Destinations defines them as places that collect and analyze data in order to better understand tourists' needs and behaviors and, as a result, can offer better services and experiences in a more context-aware and real-time manner (Xiang & Fesenmaier, 2017). In accordance with the study of (Huang et al., 2012; Tyan et al., 2020), it can be said that the true sense of Smart Tourism Destinations is to use ICTs to concentrate on and cater to tourists' needs in order to improve tourism service efficiency and management.Smart Tourism has turned the tourism and hospitality industry into a new paradigm. It has

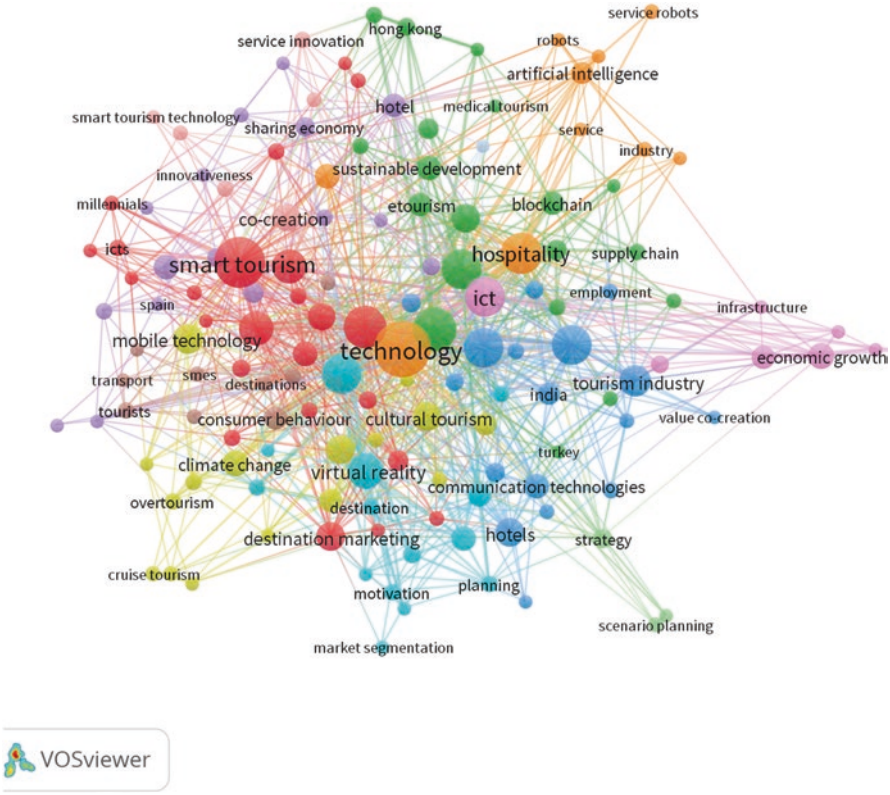

Fig. 1.8 Theme exploration using keywords. (Source: developed by the authors using VOSviewer, 2021)

Table 1.7 Frequently used keywords

Keyword	Occurrences	Total link strength	Keyword	Occurrences	Total link strength
Technology	82	120	Augmented reality	30	34
Smart tourism	66	91	E-tourism	20	34
Internet	51	89	Big data	22	33
Hospitality	45	85	Consumer behavior	14	33
ICT/Information and Communication Technology	54	110	Artificial intelligence	13	31
Innovation	42	71	Destination marketing	21	31
Social media	46	62	Co-creation	20	29

(continued)

Table 1.7 (continued)

Keyword	Occurrences	Total link strength	Keyword	Occurrences	Total link strength
Information technology	40	53	E-tourism	15	29
Sustainable tourism	40	49	Mobile technology	23	29
Virtual reality	34	48	Economic growth	18	28
Sustainability	42	44	Tourism industry	26	28
Technology acceptance model	31	42	Marketing	16	27

Source: developed by the authors using R Studio, 2021

brought changes in the tourist experience to service providers' strtegies and ultimalty leading to a competitive smart industry gradually. This paradigm shift of toursim towards smart tourism is modifiying the concepts and languages what we are experiencing in the tourism and hospitality industry. According to (Pencarelli, 2020), everything is becoming "Smart" in tourism, and thus, we talk about smart travelers, smart cities, smart destinations, smart eyewear, smart cards, smart cars, and smart ecosystems, among other things. Its recommeded that smart tourism should be adopted considering the concept of smart citites so that it can improve the quality of life, better tourist experience and finally ensure sutanability.

Virtual Reality

"Virtual reality (VR) tourism, using the three-dimensional (3D) world of an innovative technology, is formed via a combination of visual, kinetic, and audio elements so that users can actually experience a real object from a tourist perspective" (Kim et al., 2020: p. 69). With the advancement of technology, VR tourism ensures a holistic picture of hotels and toursm destinations by reducing consumers' risk as it familarize consumers with unfamilarses destinations (Kim et al., 2020). Planning and management, heritage protection, marketing, accessibility, education, and entertainment are the six key tourism-related fields where VR has been used extensivly (Guttentag, 2010; Jude & Ukekwe, 2020; Yuce et al., 2020). VR appraoch has also been used to bridge information gap between tourist and sevice provider (Caron-Fasan et al., 2020). Thus, VR has reshapesd the tourism industry by providing new customer experience.

Social Media in Tourism Industry

Social Media anoher significant blessings of technology in this era. According to (Kim & Law, 2015), promoting tourism acitivities through the social media refers to connecting, partnering and sharing of visual and conetent material with social media among the users of online communities. Social media provides different types of benefits to both tourists and tourism service providers by faciltaing interaction among the customer or between customers and service providers. It offers entertainment and trendimess through different types of comments. Considerning the necessity of adopting social media, tourism and hospitality also embraced this blessings into this industry.Social media has dramatically changed the way of creating and sharing information (Buhalis & Foerste, 2015). Both customers and service providers can share ideas direclty with their target segemnt. According to Hays et al. (2013), social media refers to the practises, activities, and behaviours of online communities of individuals who use conversational media to share knowledge, information, and ideas. Conversational media are web-based apps that allow users to quickly produce and share material in the form of images, words, videos, and audios.

Application of Internet of Things (IoT) in Tourism

According to Sethi and Sarangi (2017), the IoT is a paradigm in which devices with sensors, actuators, and processors connect with one another in order to accomplish a meaningful goal. Tourism and hospitaility industry has already adopted the IoT in different arena of tourism such as, Geo-location technologies, Medical (wellness) tourism, Ecotourism, Retail tourism services, Virtual concierge, airport management (Car et al., 2019), through the geolocation technologies tourist an have a good travel experience as it provides to tract different location from route planning to accommodation arrangement and journey planning. IoT has a profound impact on medical tourism as using IoT technologies, patients' health can be monitored from a remote palce (Car et al., 2019). Besides this, IoT has brought a dramatic change in the tourist travel experiences by introucing different types of apps.

Theoretical Background in Technology-Tourism Research

Systematic literature reviews on the topic of technology application in tourism and hospitality industry revels that various theories have been utilized to study the topic of this study. Theories like Technology Adoption Model (TAM), Technology Organization and Environment Model (TOE), Stimuli Organism and Response Theory (SOR), Innovation diffusion model (DIT), Task technology fit (TTF) theory and applied the unified theory of acceptance and use of technology (UTAUT)

Table 1.8 Theories adopted in technology-tourism research

Theories adopted technology & tourism research	Study references	
Technology-organization-environment (TOE)	Yadegaridehkordi et al. (2018)	1 study
Innovation diffusion theory (DIT)	Adedoyin et al. (2020), Ajagunna et al, (2020), Alrawadieh et al. (2021), Casado-Díaz et al. (2021), Foris et al. (2020), Gunarathne et al. (2020), Jin et al. (2020), Kamboj and Gupta (2020), Kamel and El Sherif (2001), Mehraliyev et al. (2021), Pai et al. (2021), Sultan et al. (2021), Sun et al. (2021), Valls and Roca (2021), Wang et al. (2021)	15 studies
Technology acceptance model (TAM)	Bae and Han (2020, Bisson and Hambleton (2020), Cheunkamon et al. (2020), El-Gohary (2012), Huang et al. (2016, 2019), Im and Hancer (2014), Kim et al. (2021), Kowalczyk-Anioł and Nowacki, (2020), Lee et al. (2013), Lin et al. (2020), Malik and Rao (2019), Palos-Sanchez et al. (2017), Sharmin et al. (2021), Sila (2015), Singh and Srivastava (2019), Vyas (2019)	15 studies
Stimulus-Organism-Response (SOR)	Alqatan et al. (2012), Lama et al. (2020), Lerario and Varasano (2020), Sharma et al. (2020), Smerecnik and Andersen (2011), Soares et al. (2020)	6 studies
Theory of planned behavior (TPB)	Lim (2009), Sánchez-Torres et al. (2019)	2 studies

Source: synthesized by the authors, 2021

have been widely used theories in technology and tourism research. The table summarizes the widely used theories along with corresponding studies in brief (Table 1.8).

Conclusion

The study uses four bibliometric analysis processes to conduct the SLR: co-citation, network visualisation through co-occurrence data, multi-dimensional scaling, and hierarchical cluster analysis, which illuminates the intellectual structure of technology application in the tourism industry. Second, the chapter discusses how technology is influencing tourism in a new way. Third, the chapter describes how technology is implemented and embraced in the tourism business, based on the models and ideas discussed in prior research. The study's findings show that the Fourth industrial revolution technologies and ubiquitous usage have been rapidly infiltrating every aspect of the tourism industry. At present era, technologies are not merely considered instrumental in mitigating communication gap, rather technologies act as a transformative driver which influence industry operation and also tailor functions and expectations of stakeholders (Sigala, 2018). Rapid technological

advancements introduce new terms in the same domain such as VR, Smart Tourism, IoT in tourism and Social media in tourism causing fundamental disruptions through empowering tourism actors to form new market, management practices, competitive advantages and offerings. As a result, technology is transforming tourism management and marketing from a static and utilitarian perspective (in which managers and tourists use technology as tools) to a transformative perspective (in which tourism markets and actors (tourism providers, stakeholders, intermediaries, and tourists) shape and are shaped by technology). The wide array of technological innovations are also expected to alter future outllook of the tourism sector. Therefore, it has become unequivocal stating that success of future tourism business will require a proper blend of smarter customer experience and technology applications that are unobtrusive and which pose no ethical, moral or privacy concerns. Developed countries are technologically sufficient to facilitate the tourism industry, and developing countries follow the same footprints as their developed counterparts. Moreover, developing countries promote their tourism attractions to the developed countries. Consequently, developing countries are positioning themselves in top list in global market share in world tourism leaving behind America and Europe. Government can play pivotal role through initiatives such as adequate infrastructure, financial support, leadership that will open up strategic window for sustainable tourism in the long run. Furthermore,repositioning of the tourist destinations, exploiting emerging opportunities and making the best use of local products and service may be few strategies to attract travellers . Institutional support is also required to anticipate and manage the negative cultural, social, environmental and economic problems arising from tourism and promote smart tourism with best customer experience towards the globe.

References

Adedoyin, F. F., Bekun, F. V., Driha, O. M., & Balsalobre-Lorente, D. (2020). The effects of air transportation, energy, ICT and FDI on economic growth in the industry 4.0 era: Evidence from the United States. *Technological Forecasting and Social Change, 160*, 120297.

Ajagunna, I., Pinnock, F., Johnson, E. S., & Teare, R. (2020). Reflections on the theme issue outcomes the fourth industrial revolution: What are the realities for maritime and tourism dependent countries? *Worldwide Hospitality and Tourism Themes, 12*(1), 104–108.

Alabau-Montoya, J., & Ruiz-Molina, M. E. (2020). Enhancing visitor experience with war heritage tourism through information and communication technologies: Evidence from Spanish Civil War museums and sites. *Journal of Heritage Tourism, 15*(5), 500–510.

Alqatan, S., Singh, D., & Ahmad, K. (2012). Study on success factors to enhance customer trust for mobile commerce in small and medium-sized tourism enterprises (SMTEs) – A conceptual model. *Journal of Theoretical and Applied Information Technology, 46*(2), 550–564.

Alrawadieh, Z., Alrawadieh, Z., & Cetin, G. (2021). Digital transformation and revenue management: Evidence from the hotel industry. *Tourism Economics, 27*(2), 328–345.

Aluri, A. (2017). Mobile augmented reality (MAR) game as a travel guide: Insights from Pokémon GO. *Journal of Hospitality and Tourism Technology, 8*(1), 55–72.

Anees-Ur-Rehman, M., Wong, H. Y., & Hossain, M. (2016). The progression of brand orientation literature in twenty years: A systematic literature review. *Journal of Brand Management, 23*(6), 612–630.

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics, 11*(4), 959–975.

Bae, S. Y., & Han, J. H. (2020). Considering cultural consonance in trustworthiness of online hotel reviews among generation Y for sustainable tourism: An extended TAM model. *Sustainability, 12*(7), 2942.

Bae, S., Jung, T. H., Moorhouse, N., Suh, M., & Kwon, O. (2020). The influence of mixed reality on satisfaction and brand loyalty in cultural heritage attractions: A brand equity perspective. *Sustainability, 12*(7), 2956.

Bisson, L., & Hambleton, T. (2020). COVID-19 Impact on West African Value Chains. *Clingendael Institute*. Retrieved from: https://www.clingendael.org/publication/covid-19-west-africa-impact-value-chains. Accssed 10 June 2021.

Bodkhe, U., Tanwar, S., Parekh, K., Khanpara, P., Tyagi, S., Kumar, N., & Alazab, M. (2020). Blockchain for Industry 4.0: A comprehensive review. *IEEE Access, 8*, 79764–79800.

Boes, K., Buhalis, D., & Inversini, A. (2016). Smart tourism destinations: Ecosystems for tourism destination competitiveness. *International Journal of Tourism Cities, 2*(2), 108–124.

Bogicevic, V., Seo, S., Kandampully, J. A., Liu, S. Q., & Rudd, N. A. (2019). Virtual reality presence as a preamble of tourism experience: The role of mental imagery. *Tourism Management, 74*, 55–64.

Briciu, A., Briciu, V. A., & Kavoura, A. (2020). Evaluating how "smart" Brasov, Romania can be virtually via a mobile application for cultural tourism. *Sustainability, 12*(13), 5324.

Briner, R. B., & Denyer, D. (2009). Systematic review and evidence synthesis as a practice and scholarship tool. In D. M. Rousseau (Ed.), *Handbook of evidence-based management: Companies, classrooms and research* (pp. 112–119). Oxford University Press.

Buhalis, D. (2000). Tourism and information technologies: Past, present and future. *Tourism Recreation Research, 25*(1), 41–58.

Buhalis, D. (2003). *eTourism: Information technology for strategic tourism management*. Financial Times/Prentice Hall.

Buhalis, D., & Amaranggana, A. (2015). Smart tourism destinations enhancing tourism experience through personalisation of services. In I. Tussyadiah & A. Inversini (Eds.), *Information and communication technologies in tourism 2015* (pp. 377–389). Springer.

Buhalis, D., & Foerste, M. (2015). SoCoMo marketing for travel and tourism: Empowering co-creation of value. *Journal of Destination Marketing & Management, 4*(3), 151–161.

Buhalis, D., & Kaldis, K. (2008). eEnabled internet distribution for small and medium sized hotels: The case of Athens. *Tourism Recreation Research, 33*(1), 67–81.

Buhalis, D., & Main, H. (1998). Information technology in peripheral small and medium hospitality enterprises: strategic analysis and critical factors. *International Journal of Contemporary Hospitality, 10*(5), 198–202.

Çakar, K., & Aykol, Ş. (2020). Understanding travellers' reactions to robotic services: A multiple case study approach of robotic hotels. *Journal of Hospitality and Tourism Technology, 12*(1), 155–174.

Canabal, A., & White III, G. O. (2008). Entry mode research: Past and future. *International business review, 17*(3), 267–284.

Car, T., Pilepić Stifanich, L., & Šimunić, M. (2019). *Internet of Things (Iot) in tourism and hospitality: Opportunities and challenges*. September, pp. 163–173.

Caron-Fasan, M.-L., Lesca, N., Perea, C., & Beyrouthy, S. (2020). Adoption of enterprise social networking: Revisiting the IT innovation adoption model of Hameed et al. *Journal of Engineering and Technology Management, 56*, 101572.

Casado-Díaz, A. B., Navarro-Ruiz, S., Nicolau, J. L., & Ivars-Baidal, J. (2021). Expanding our understanding of cruise visitors' expenditure at destinations: The role of spatial patterns, onshore visit choice and cruise category. *Tourism Management, 83*, 104199.

Caviggioli, F., & Ughetto, E. (2019). A bibliometric analysis of the research dealing with the impact of additive manufacturing on industry, business and society. *International Journal of Production Economics, 208*, 254–268.

Cheunkamon, E., Jomnonkwao, S., & Ratanavaraha, V. (2020). Determinant factors influencing Thai tourists' intentions to use social media for travel planning. *Sustainability, 12*(18), 1–21.

Christou, P., Simillidou, A., & Stylianou, M. C. (2020). Tourists' perceptions regarding the use of anthropomorphic robots in tourism and hospitality. *International Journal of Contemporary Hospitality Management, 32*(11), 3665–3683.

Chung, N., Tyan, I., & Han, H. (2017). Enhancing the smart tourism experience through geotag. *Information Systems Frontiers, 19*(4), 731–742.

Courtial, J., Callon, M., & Sigogneau, A. (1993). The use of patent titles for identifying the topics of invention and forecasting trends. *Scientometrics, 26*(2), 231–242.

Cranmer, E. E., Dieck, M. C., & Fountoulaki, P. (2020). Exploring the value of augmented reality for tourism. *Tourism Management Perspectives, 35*, 100672.

de Kervenoael, R., Hasan, R., Schwob, A., & Goh, E. (2020). Leveraging human-robot interaction in hospitality services: Incorporating the role of perceived value, empathy, and information sharing into visitors' intentions to use social robots. *Tourism Management, 78*, 104042.

Doolin, B., Burgess, L., & Cooper, J. (2002). Evaluating the use of the Web for tourism marketing: A case study from New Zealand. *Tourism Management, 23*(5), 557–561.

El-Gohary, H. (2012). Factors affecting E-Marketing adoption and implementation in tourism firms: An empirical investigation of Egyptian small tourism organisations. *Tourism Management, 33*(5), 1256–1269.

Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics, 162*, 101–114.

Filimonau, V., & Naumova, E. (2020). The blockchain technology and the scope of its application in hospitality operations. *International Journal of Hospitality Management, 87*, 102383.

Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2021). Impacts of technological embodiment through virtual reality on potential guests' emotions and engagement. *Journal of Hospitality Marketing and Management, 30*(1), 1–20.

Foris, D., Crihalmean, N., & Foris, T. (2020). Exploring the environmental practices in hospitality through booking websites and online tourist reviews. *Sustainability, 12*(24), 1–18.

Foroudi, P., Marvi, R., & Kizgin, H. (2020). THE OTHERS: The role of individual personality, cultural acculturation, and perceived value on towards firm's social media and acculturation orientation. *International Journal of Information Management, 52*, 102075.

Foroudi, P., Akarsu, T. N., Marvi, R., & Balakrishnan, J. (2021). Intellectual evolution of social innovation: A bibliometric analysis and avenues for future research trends. *Industrial Marketing Management, 93*, 446–465.

Fouroudi, P., Kitchen, P. J., Marvi, R., Akarsu, T. N., & Uddin, H. (2020). A bibliometric investigation of service failure literature and a research agenda. *European Journal of Marketing, 54*(10), 2575–2619.

Fusté-Forné, F. (2021). Robot chefs in gastronomy tourism: What's on the menu? *Tourism Management Perspectives, 37*, 100774.

Galvan, J. L., & Galvan, M. C. (2017). *Writing literature reviews: A guide for students of the social and behavioral sciences*. Routledge.

Gretzel, U. (2011). Intelligent systems in tourism: A social science perspective. *Annals of Tourism Research, 38*(3), 757–779.

Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets, 25*, 179–188.

Gunarathne, N., de Alwis, A., & Alahakoon, Y. (2020). Challenges facing sustainable urban mining in the e-waste recycling industry in Sri Lanka. *Journal of Cleaner Production, 251*, 119641.

Guttentag, D. A. (2010). Virtual reality: Applications and implications for tourism. *Tourism Management, 31*(5), 637–651.

Han, D.-I. D., Tom Dieck, M. C., & Jung, T. (2019). Augmented Reality Smart Glasses (ARSG) visitor adoption in cultural tourism. *Leisure Studies, 38*(5), 618–633.

Hays, S., Page, S. J., & Buhalis, D. (2013). Social media as a destination marketing tool: Its use by national tourism organisations. *Current Issues in Tourism, 16*(3), 211–239.

He, Q. (1999). Knowledge discovery through co-word analysis. *Library Trends, 48*(1), 133–159.

Herrero, A., San Martín, H., & Collado, J. (2018). Market orientation and SNS adoption for marketing purposes in hospitality microenterprises. *Journal of Hospitality and Tourism Management, 34*, 30–40.

Hjørland, B. (2013). Citation analysis: A social and dynamic approach to knowledge organization. *Information Processing and Management, 49*(6), 1313–1325.

Hopken, W., Gretzel, U., & Law, R. (Eds.). (2009). *Information and communication technologies in tourism 2009*. Springer.

Hou, Y., Zhang, K., & Li, G. (2021). Service robots or human staff: How social crowding shapes tourist preferences. *Tourism Management, 83*, 104242.

Huang, X., Yuan, J., & Shi, M. (2012). Condition and key issues analysis on the smarter tourism construction in China. In F. L. Wang, J. Lei, R. W. H. Lau, & J. Zhang (Eds.), *Multimedia and signal processing. CMSP 2012. Communications in computer and information science* (pp. 444–450). Springer.

Huang, Y. C., Backman, K. F., Backman, S. J., & Chang, L. L. (2016). Exploring the implications of virtual reality technology in tourism marketing: An integrated research framework. *Intrnational Journal of Tourism Research, 18*(2), 116–128.

Huang, Y. C., Chang, L. L., Yu, C. P., & Chen, J. (2019). Examining an extended technology acceptance model with experience construct on hotel consumers' adoption of mobile applications. *Journal of Hospitality Marketing and Management, 28*(8), 957–980.

Im, J. Y., & Hancer, M. (2014). Shaping travelers' attitude toward travel mobile applications. *Journal of Hospitality and Tourism Technology, 5*(2), 177–193.

Inversini, A., & Masiero, L. (2014). Selling rooms online: The use of social media and online travel agents. *International Journal of Contemporary Hospitality Management, 26*(2), 272–292.

Ivanov, S. (2019). Ultimate transformation: How will automation technologies disrupt the travel, tourism and hospitality industries? *Zeitschrift Für Tourismuswissenschaft, 11*(1), 25–43.

Ivanov, S. H., Webster, C., Stoilova, E., & Slobodskoy, D. (2020). Biosecurity, crisis management, automation technologies and economic performance of travel, tourism and hospitality companies – A conceptual framework. *Tourism Economics*. https://doi.org/10.1177/1354816620946541

Ivkov, M., Blešić, I., Dudić, B., Bartáková, G. P., & Dudić, Z. (2020). Are future professionals willing to implement service robots? Attitudes of hospitality and tourism students towards service robotization. *Electronics, 9*(9), 1–16.

Jeong, M., & Shin, H. H. (2020). Tourists' experiences with smart tourism technology at smart destinations and their behavior intentions. *Journal of Travel Research, 59*(8), 1464–1477.

Jin, L., Xiao, H., & Shen, H. (2020). Experiential authenticity in heritage museums. *Journal of Destination Marketing and Management, 18*, 100493.

Jude, O. C., & Ukekwe, C. (2020). Tourism and virtual reality (VR) in developing nations. *African Journal of Hospitality, Tourism and Leisure, 9*(2), 1–16.

Jung, T., Tom Dieck, M. C., Lee, H., & Chung, N. (2020). Moderating role of long-term orientation on augmented reality adoption. *International Journal of Human-Computer Interaction, 36*(3), 239–250.

Kamboj, S., & Gupta, S. (2020). Use of smart phone apps in co-creative hotel service innovation: An evidence from India. *Current Issues in Tourism, 23*(3), 323–344.

Kamel, S., & El Sherif, A. (2001). *The role of small and medium-sized enterprises in developing Egypt's tourism industry using e-commerce*. In K. D. F. A. T. R. Kocaoglu, D. F. & T. R. Anderson (Eds.), PICMET '01. Portland international conference on management of engineering and technology. proceedings Vol.1: Book of summaries (IEEE Cat. No.01CH37199), pp. 60–68.

Kang, H. (2020). Impact of VR on impulsive desire for a destination. *Journal of Hospitality and Tourism Management, 42*(January), 244–255.

Kassarjian, H. H. (1977). Content analysis in consumer research. *Journal of Consumer Research, 4*(1), 8–18.

Kelly, P., Lawlor, J., & Mulvey, M. (2019). Self-service technologies in the travel, tourism, and hospitality sectors: Principles and practice. *Robots, Artificial Intelligence and Service Automation in Travel, Tourism and Hospitality, 1994*, 57–78.

Keupp, M. M., & Gassmann, O. (2009). The past and the future of international entrepreneurship: A review and suggestions for developing the field. *Journal of management, 35*(3), 600–633.

Khanra, S., Dhir, A., & Mäntymäki, M. (2020). Big data analytics and enterprises: A bibliometric synthesis of the literature. *Enterprise Information Systems, 14*(6), 737–768.

Khanra, S., Dhir, A., Kaur, P., & Mäntymäki, M. (2021). Bibliometric analysis and literature review of ecotourism: Toward sustainable development. *Tourism Management Perspectives, 37*, 100777.

Kim, M. J., & Hall, C. M. (2019). A hedonic motivation model in virtual reality tourism: Comparing visitors and non-visitors. *International Journal of Information Management, 46*, 236–249.

Kim, H. H., & Law, R. (2015). Smartphones in tourism and hospitality marketing: A literature review. *Journal of Travel & Tourism Marketing, 32*(6), 692–711.

Kim, M. J., Lee, C. K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of Travel Research, 59*(1), 69–89.

Kim, S. S., Kim, J., Badu-Baiden, F., Giroux, M., & Choi, Y. (2021). Preference for robot service or human service in hotels? Impacts of the COVID-19 pandemic. *International Journal of Hospitality Management, 93*, 102795.

Kitchenham, B., & Charters, S. (2007). G*uidelines for performing systematic literature reviews in SE.* Retrieved from: https://www.elsevier.com/__data/promis_misc/525444systematicreviewsguide.pdf. Accssed 10 June 2021.

Kizildag, M., Dogru, T., Zhang, T. C., Mody, M. A., Altin, M., Ozturk, A. B., & Ozdemir, O. (2019). Blockchain: A paradigm shift in business practices. *International Journal of Contemporary Hospitality Management, 32*(3), 953–975.

Knoll, J., & Matthes, J. (2017). The effectiveness of celebrity endorsements: A meta-analysis. *Journal of the Academy of Marketing Science, 45*(1), 55–75.

Kovács, Z., Vida, G., Elekes, Á., & Kovalcsik, T. (2021). Combining social media and mobile positioning data in the analysis of tourist flows: A case study from Szeged, Hungary. *Sustainability, 13*(5), 2926.

Kowalczyk-Anioł, J., & Nowacki, M. (2020). Factors influencing Generation Y's tourism-related social media activity: The case of Polish students. *Journal of Hospitality and Tourism Technology, 11*(3), 543–558.

Kubo, T., Uryu, S., Yamano, H., Tsuge, T., Yamakita, T., & Shirayama, Y. (2020). Mobile phone network data reveal nationwide economic value of coastal tourism under climate change. *Tourism Management, 77*, 104010.

Lacka, E. (2020). Assessing the impact of full-fledged location-based augmented reality games on tourism destination visits. *Current Issues in Tourism, 23*(3), 345–357.

Lama, S., Pradhan, S., & Shrestha, A. (2020). Exploration and implication of factors affecting e-tourism adoption in developing countries: A case of Nepal. *Information Technology and Tourism, 22*(1), 5–32.

Law, R., Buhalis, D., & Cobanoglu, C. (2014). Progress on information and communication technologies in hospitality and tourism. *International Journal of Contemporary Hospitality Management, 26*(5), 727–750.

Law, R., Chan, I. C. C., & Wang, L. (2018). A comprehensive review of mobile technology use in hospitality and tourism. *Journal of Hospitality Marketing and Management, 27*(6), 626–648.

Law, R., Leung, D., & Chan, I. C. C. (2019). Progression and development of information and communication technology research in hospitality and tourism: A state-of-the-art review. *International Journal of Contemporary Hospitality Management, 32*(2), 511–534.

Lee, W.-J., & Kim, Y. H. (2021). Does VR tourism enhance users' experience? *Sustainability, 13*(2), 1–15.

Lee, B. C., Cho, J., & Hwang, D. (2013). An integration of social capital and tourism technology adoption – A case of convention and visitors bureaus. *Tourism and Hospitality Research, 13*(3), 149–165.

Lee, M., Lee, S. A., Jeong, M., & Oh, H. (2020). Quality of virtual reality and its impacts on behavioral intention. *International Journal of Hospitality Management, 90*, 102595.

Lelo de Larrea, G., Altin, M., Koseoglu, M. A., & Okumus, F. (2021). An integrative systematic review of innovation research in hospitality and tourism. *Tourism Management Perspectives, 37*, 100789.

Lerario, A., & Varasano, A. (2020). An IoT smart infrastructure for S. Domenico Church in Matera's "Sassi": A multiscale perspective to built heritage conservation. *Sustainability, 12*(16), 6553.
Leung, R. (2019). Smart hospitality: Taiwan hotel stakeholder perspectives. *Tourism Review, 74*(1), 50–62.
Leung, R. (2020). Hospitality technology progress towards intelligent buildings: A perspective article. *Tourism Review, 76*(1), 69–73.
Li, X., & Law, R. (2020). Network analysis of big data research in tourism. *Tourism Management Perspectives, 33*, 100608.
Li, Y., Hu, C., Huang, C., & Duan, L. (2017). The concept of smart tourism in the context of tourism information services. *Tourism Management, 58*, 293–300.
Li, J., Pearce, P. L., & Low, D. (2018). Media representation of digital-free tourism: A critical discourse analysis. *Tourism Management, 69*, 317–329.
Li, X., Law, R., Xie, G., & Wang, S. (2021). Review of tourism forecasting research with internet data. *Tourism Management, 83*, 104245.
Liang, L. J., & Elliot, S. (2021). A systematic review of augmented reality tourism research: What is now and what is next? *Tourism and Hospitality Research, 21*(1), 15–30.
Liliani, Tjahjono, B., & Cao, D. (2020). Advancing bioplastic packaging products through co-innovation: A conceptual framework for supplier-customer collaboration. *Journal of Cleaner Production, 252*, 119861.
Lim, W. M. (2009). Alternative models framing UK independent hoteliers' adoption of technology. *International Journal of Contemporary Hospitality Management, 21*(5), 610–618.
Lin, S.-W., & Fu, H.-P. (2012). Uncovering critical success factors for business-to-customer electronic commerce in travel agencies. *Journal of Travel and Tourism Marketing, 29*(6), 566–584.
Lin, L. P. L., Huang, S. C. L., & Ho, Y. C. (2020). Could virtual reality effectively market slow travel in a heritage destination? *Tourism Management, 78*(October 2019), 104027.
Lo, W. H., & Cheng, K. L. B. (2020). Does virtual reality attract visitors? The mediating effect of presence on consumer response in virtual reality tourism advertising. *Information Technology and Tourism, 22*(4), 537–562.
Loureiro, S. M. C., Guerreiro, J., & Ali, F. (2020). 20 years of research on virtual reality and augmented reality in tourism context: A text-mining approach. *Tourism Management, 77*, 104028.
Malik, G., & Rao, A. S. (2019). Extended expectation-confirmation model to predict continued usage of ODR/ride hailing apps: Role of perceived value and self-efficacy. *Information Technology and Tourism, 21*(4), 461–482.
Mariani, M. (2019). Big data and analytics in tourism and hospitality: A perspective article. *Tourism Review, 75*(1), 299–303.
Mehraliyev, F., Choi, Y., & King, B. (2021). Expert online review platforms: Interactions between specialization, experience, and user power. *Journal of Travel Research, 60*(2), 384–400.
Michopoulou, E., & Buhalis, D. (2008). Performance measures of net-enabled hypercompetitive industries: The case of tourism. *International Journal of Information Managmnt, 28*(3), 158–180.
Mingotto, E., Montaguti, F., & Tamma, M. (2020). Challenges in re-designing operations and jobs to embody AI and robotics in services. Findings from a case in the hospitality industry. *Electronic Markets*. https://doi.org/10.1007/s12525-020-00439-y
Mistilis, N., Buhalis, D., & Gretzel, U. (2014). Future eDestination marketing: Perspective of an Australian tourism stakeholder network. *Journal of Travel Research, 53*(6), 778–790.
Moreno, P., & Tejada, P. (2019). Reviewing the progress of information and communication technology in the restaurant industry. *Journal of Hospitality and Tourism Technology, 10*(4), 673–688.
Mosweunyane, L., Rambe, P., & Dzansi, D. (2019). Use of social media in Free State tourism small, medium and micro enterprises to widen business networks for competitiveness. *South African Journal of Economic and Management Sciences, 22*(1), 1–10.
Munar, A. M., & Jacobsen, J. K. S. (2014). Motivations for sharing tourism experiences through social media. *Tourism Management, 43*, 46–54.

Muñoz-Leiva, F., Viedma-del-Jesús, M. I., Sánchez-Fernández, J., & López-Herrera, A. G. (2012). An application of co-word analysis and bibliometric maps for detecting the most highlighting themes in the consumer behaviour research from a longitudinal perspective. *Quality and Quantity, 46*(4), 1077–1095.

Nam, K., Dutt, C. S., Chathoth, P., Daghfous, A., & Khan, M. S. (2020). The adoption of artificial intelligence and robotics in the hotel industry: Prospects and challenges. *Electronic Markets*. https://doi.org/10.1007/s12525-020-00442-3

Neuhofer, B., Buhalis, D., & Ladkin, A. (2012). Conceptualising technology enhanced destination experiences. *Journal of Destination Marketing & Management, 1*(1-2), 36–46.

Nuryyev, G., Wang, Y. P., Achyldurdyyeva, J., Jaw, B. S., Yeh, Y. S., Lin, H. T., & Wu, L. F. (2020). Blockchain technology adoption behavior and sustainability of the business in tourism and hospitality SMEs: An empirical study. *Sustainability, 12*(3), 1256.

Osei, B. A., Ragavan, N. A., & Mensah, H. K. (2020). Prospects of the fourth industrial revolution for the hospitality industry: A literature review. *Journal of Hospitality and Tourism Technology, 11*(3), 479–494.

Pai, C. K., Liu, Y., Kang, S., & Dai, A. (2020). The role of perceived smart tourism technology experience for tourist satisfaction, happiness and revisit intention. *Sustainability, 12*(16), 6592.

Pai, C., Kang, S., Liu, Y., & Zheng, Y. (2021). An examination of revisit intention based on perceived smart tourism technology experience. *Sustainability, 13*(2), 1–14.

Palos-Sanchez, P. R., Hernandez-Mogollon, J. M., & Campon-Cerro, A. M. (2017). The behavioral response to Location Based Services: An examination of the influence of social and environmental benefits, and privacy. *Sustainability, 9*(11).

Pappas, N., Caputo, A., Pellegrini, M. M., Marzi, G., & Michopoulou, E. (2021, January). The complexity of decision-making processes and IoT adoption in accommodation SMEs. *Journal of Business Research*. https://doi.org/10.1016/j.jbusres.2021.01.010

Park, S. (2020). Multifaceted trust in tourism service robots. *Annals of Tourism Research, 81*(March), 102888.

Pateli, A., Mylonas, N., & Spyrou, A. (2020). Organizational adoption of social media in the hospitality industry: An integrated approach based on DIT and TOE frameworks. *Sustainability, 12*(17), 7132.

Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know?. *International Business Review, 29*(4), 101717.

Paul, J., & Feliciano-Cestero, M. M. (2020). Five decades of research on foreign direct investment by MNEs: An overview and research agenda. *Journal of Business Research, 124*, 800–812.

Paul, J., & Rosado-Serrano, A. (2019). Gradual internationalization vs born-global/international new venture models: A review and research agenda. *International Marketing Review, 36*(6), 830–858.

Paul, J., & Singh, G. (2017). The 45 years of foreign direct investment research: Approaches, advances and analytical areas. *The World Economy, 40*(11), 2512–2527.

Pencarelli, T. (2020). The digital revolution in the travel and tourism industry. *Information Technology and Tourism, 22*(3), 455–476.

Poon, A. (1993). *Tourism, technology and competitive strategies*. CABI.

Randhawa, K., Wilden, R., & Hohberger, J. (2016). A bibliometric review of open innovation: Setting a research agenda. *Journal of Product Innovation Management, 33*(6), 750–772.

Rashideh, W. (2020). Blockchain technology framework: Current and future perspectives for the tourism industry. *Tourism Management, 80*, 104125.

Rey-Martí, A., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2016). A bibliometric analysis of social entrepreneurship. *Journal of Business Research, 69*(5), 1651–1655.

Samiee, S., Chabowski, B. R., & Hult, G. T. M. (2015). International relationship marketing: Intellectual foundations and avenues for further research. *Journal of International Marketing, 23*(4), 1–21.

Sánchez-Torres, J. A., Arroyo-Cañada, F. J., Rojas-Berrio, S. P., Robayo-Pinzón, O. J., & Fontalvo-Cerpa, W. (2019). The Colombian electronic consumer: Analysis of the leading factors of e-commerce use. *International Journal of Electronic Marketing and Retailing, 10*(3), 283–308.

Santos-Júnior, A., Almeida-García, F., Morgado, P., & Mendes-Filho, L. (2020). Residents' quality of life in smart tourism destinations: A theoretical approach. *Sustainability, 12*(20), 1–24.

Sethi, P., & Sarangi, S. R. (2017). Internet of things: Architectures, protocols, and applications. *Journal of Electrical and Computer Engineering*. https://doi.org/10.1155/2017/9324035

Sharma, S., Singh, G., Pratt, S., & Narayan, J. (2020). Exploring consumer behavior to purchase travel online in Fiji and Solomon Islands? An extension pf the Utaut framework. *International Journal of Culture, Tourism, and Hospitality Research, 15*(2), 227–247.

Sharmin, F., Tipu Sultan, M., Badulescu, D., Badulescu, A., Borma, A., & Li, B. (2021). Sustainable destination marketing ecosystem through smartphone-based social media: The consumers' acceptance perspective. *Sustainability, 13*(4), 1–24.

Sheldon, P. J. (1997). Tourism information technology. In L. Dweyr & P. Forsyth (Eds.), *International handbook on the economics of tourism* (pp. 399–418). Edward Elgar.

Shen, S., Sotiriadis, M., & Zhang, Y. (2020a). The influence of smart technologies on customer journey in tourist attractions within the smart tourism management framework. *Sustainability, 12*(10), 4157.

Shen, S., Sotiriadis, M., & Zhou, Q. (2020b). Could smart tourists be sustainable and responsible as well? The contribution of social networking sites to improving their sustainable and responsible behavior. *Sustainability, 12*(4), 1–21.

Shin, H., & Perdue, R. R. (2019). Self-service technology research: A bibliometric co-citation visualization analysis. *International Journal of Hospitality Management, 80*, 101–112.

Sigala, M. (2018). Implementing social customer relationship management: A process framework and implications in tourism and hospitality. *International Journal of Contemporary Hospitality Management, 30*(7), 2698–2726.

Sigala, M., & Gretzel, U. (Eds.). (2017). *Advances in social media for travel, tourism and hospitality: New perspectives, practice and cases*. Routldge.

Sila, I. (2015). The state of empirical research on the adoption and diffusion of business-to-business e-commerce. *International Journal of Electronic Business, 12*(3), 258–301.

Singh, S., & Srivastava, P. (2019). Social media for outbound leisure travel: A framework based on technology acceptance model (TAM). *Journal of Tourism Futures, 5*(1), 43–61.

Smerecnik, K. R., & Andersen, P. A. (2011). The diffusion of environmental sustainability innovations in North American hotels and ski resorts. *Journal of Sustainable Tourism, 19*(2), 171–196.

Soares, A. L. V., Mendes-Filho, L., & Gretzel, U. (2020). Technology adoption in hotels: Applying institutional theory to tourism. *Tourism Review*. https://doi.org/10.1108/TR-05-2019-0153

Stankov, U., & Gretzel, U. (2020). Tourism 4.0 technologies and tourist experiences: A human-centered design perspective. *Information Technology and Tourism, 22*(3), 477–488.

Stylos, N., Zwiegelaar, J., & Buhalis, D. (2021). Big data empowered agility for dynamic, volatile, and time-sensitive service industries: The case of tourism sector. *International Journal of Contemporary Hospitality Management, 33*(3), 1015–1036.

Sultan, M. T., Sharmin, F., Badulescu, A., Stiubea, E., & Xue, K. (2021). Travelers' responsible environmental behavior towards sustainable coastal tourism: An empirical investigation on social media user-generated content. *Sustainability, 13*(1), 1–19.

Sun, B., Liu, L. Y., Chan, W. W., Zhang, C. X., & Chen, X. (2021). Signals of hotel effort on enhancing IAQ and booking intention: Effect of customer's body mass index associated with sustainable marketing in tourism. *Sustainability, 13*(3), 1–20.

Thees, H., Erschbamer, G., & Pechlaner, H. (2020). The application of blockchain in tourism: Use cases in the tourism value system. *European Journal of Tourism Research, 26*(2020), 1–21.

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review* Introduction: The need for an evidence- informed approach. *British Journal of Management, 14*, 207–222.

Tuomi, A., Tussyadiah, I. P., & Stienmetz, J. (2020). Leveraging LEGO® Serious Play® to embrace AI and robots in tourism. *Annals of Tourism Research, 81*, 102736.

Tussyadiah, I. (2020). A review of research into automation in tourism: Launching the annals of tourism research curated collection on artificial intelligence and robotics in tourism. *Annals of Tourism Research, 81*, 102883.

Tyan, I., Yagüe, M. I., & Guevara-Plaza, A. (2020). Blockchain technology for smart tourism destinations. *Sustainability, 12*(22), 1–11.

Ukpabi, D. C., & Karjaluoto, H. (2018). What drives travelers' adoption of user-generated content? A literature review. *Tourism Management Perspectives, 28*, 251–273.

Valls, F., & Roca, J. (2021). Visualizing digital traces for sustainable urban management: Mapping tourism activity on the virtual public space. *Sustainability, 13*(6), 3159.

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics, 84*(2), 523–538.

van Eck, N. J., & Waltman, L. (2016). Text mining and visualization using *VOSviewer*. Retrieved from: https://arxiv.org/ftp/arxiv/papers/1109/1109.2058.pdf. Accssed 10 June 2021.

van Nuenen, T., & Scarles, C. (2021). Advancements in technology and digital media in tourism. *Tourist Studies, 21*(1), 119–132.

Van, N. T. T., Vrana, V., Duy, N. T., Minh, D. X. H., Dzung, P. T., Mondal, S. R., & Das, S. (2020). The role of human–machine interactive devices for post-COVID-19 innovative sustainable tourism in Ho Chi Minh City, Vietnam. *Sustainability, 12*(22), 1–30.

Venkatesh, V., & Bala, H. (2012). Adoption and impacts of interorganizational business process standards: Role of partnering synergy. *Information Systems Research, 23*(4), 1131–1157.

Vyas, C. (2019). Evaluating state tourism websites using search engine optimization tools. *Tourism Management, 73*, 64–70.

Walmsley, A. P., & Kersten, T. P. (2020). The imperial cathedral in Königslutter (Germany) as an immersive experience in virtual reality with integrated 360° panoramic photography. *Applied Sciences, 10*(4), 1517.

Wang, R., Xia, B., Dong, S., Li, Y., Li, Z., Ba, D., & Zhang, W. (2021). Research on the spatial differentiation and driving forces of eco-efficiency of regional tourism in China. *Sustainability, 13*(1), 1–23.

Wei, W. (2019). Research progress on virtual reality (VR) and augmented reality (AR) in tourism and hospitality: A critical review of publications from 2000 to 2018. *Journal of Hospitality and Tourism Technology, 10*(4), 539–570.

Werthner, H., & Klein, S. (1999). *Information technology and tourism: A challenging ralationship*. Springer.

Woerner, S. L., & Wixom, B. H. (2015). Big data: Extending the business strategy toolbox. *Journal of Information Technology, 30*(1), 60–62.

Xiang, Z. (2018). From digitization to the age of acceleration: On information technology and tourism. *Tourism Management Perspectives, 25*, 147–150.

Xiang, Z., & Fesenmaier, D. R. (2017). Big data analytics, tourism design and smart tourism. In Z. Xiang & D. Fesenmaier (Eds.), *Analytics in smart tourism design* (pp. 299–307). Springer.

Xu, X., Chen, X., Jia, F., Brown, S., Gong, Y., & Xu, Y. (2018). Supply chain finance: A systematic literature review and bibliometric analysis. *International Journal of Production Economics, 204*, 160–173.

Yadegaridehkordi, E., Nilashi, M., Nasir, M. H. N. B. M., & Ibrahim, O. (2018). Predicting determinants of hotel success and development using Structural Equation Modelling (SEM)-ANFIS method. *Tourism Management, 66*, 364–386.

Yallop, A., & Seraphin, H. (2020). Big data and analytics in tourism and hospitality: Opportunities and risks. *Journal of Tourism Futures, 6*(3), 257–262.

Yuce, A., Arasli, H., Ozturen, A., & Daskin, M. (2020). Feeling the service product closer: Triggering visit intention via virtual reality. *Sustainability, 12*(16), 1–17.

Yung, R., & Khoo-Lattimore, C. (2019). New realities: A systematic literature review on virtual reality and augmented reality in tourism research. *Current Issues in Tourism, 22*(17), 2056–2081.

Yung, R., Khoo-Lattimore, C., & Potter, L. E. (2021). VR the world: Experimenting with emotion and presence for tourism marketing. *Journal of Hospitality and Tourism Management, 46*, 160–171.

Zeng, Z., Chen, P.-J., & Lew, A. A. (2020a). From high-touch to high-tech: COVID-19 drives robotics adoption. *Tourism Geographies, 22*(3), 724–734.

Zeng, D., Tim, Y., Yu, J., & Liu, W. (2020b). Actualizing big data analytics for smart cities: A cascading affordance study. *International Journal of Information Management*. https://doi.org/10.1016/j.ijinfomgt.2020.102156

Zhang, K., Chen, Y., & Lin, Z. (2020). Mapping destination images and behavioral patterns from user-generated photos: A computer vision approach. *Asia Pacific Journal of Tourism Research, 25*(11), 1199–1214.

Zhong, L., Sun, S., Law, R., & Zhang, X. (2020). Impact of robot hotel service on consumers' purchase intention: A control experiment. *Asia Pacific Journal of Tourism Research, 25*(7), 780–798.

Zhou, S., Yan, Q., Yan, M., & Shen, C. (2020). Tourists' emotional changes and eWOM behavior on social media and integrated tourism websites. *International Journal of Tourism Research, 22*(3), 336–350.