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Innovation Research in Tourism and Hospitality Field: A Bibliometric and Visualization Analysis

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Abstract: New studies have constantly been emerging in the field of tourism. However, it is not clear to what extent which study contributes to the literature and tourism application areas. There are a few bibliometric studies that illustrate the intellectual structure of the tourism innovation field. Therefore, the purpose of this study is to determine the performance and intellectual structure of research studies conducted on innovation in the field of tourism. For this purpose, a bibliometric analysis of 387 research studies, which were published over the period 1975–2021 and cited in SCI-EXPANDED, SSCI, A&HCI indexes of WoS, is performed. Co-citation analysis indicates that innovation research studies in tourism can be categorized into three groups: (1) conceptualization and types of innovation in tourism, (2) review research on innovation in tourism, and (3) methodological studies. According to the co-word analysis, *sharing economy*, *open innovation*, *sustainability*, and *technology* are the most popular topics of recent times. A steady increase is observed in the number of citations to articles in the field of tourism innovation after 2008. The research study has crucial impacts in terms of guiding the researchers who would study in this field and providing the intellectual appearance of the field.

Keywords: innovation; knowledge; bibliometric study; visualization; tourism; COVID-19

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1. Introduction

The continuous changes in the demands and expectations of touristic consumers tend to alter the market structure of the tourism industry and render it vague [1]. Innovation, seen as a means to cope with such change and uncertainty, is perceived as the main source of competitive advantage and performance in the ever-changing tourism domain [2]. Such significance of innovation for the tourism sector has attracted the attention of many researchers over time, and innovation studies in tourism have increased, especially after 2002 [3,4]. In the following years, the number and level of research studies increased, and by 2010, the academic literature in the field of tourism innovation had reached a level that could have competed with other industrial domains [5,6].

Such an improvement has endured in the following years. Nonetheless, research studies in this regard are still scattered and fragmented [7]. For instance, in some studies, the issue of tourism innovation has been associated with various issues such as [8–11], knowledge sharing [12,13], business size and experience [14,15], innovative behavior [16–19], entrepreneurship [20–22], and performance [23–26].

Nevertheless, the field of innovation has been constantly changing and new studies have been emerging [27]. For example, Gomezelj [2], which was conducted on innovation

research in tourism, identified 152 articles on this field until 2016. In this study, however, a total of 234 articles are found over the period 2017–2020. This figure constitutes more than half (60 percent) of the 387 articles that have been analyzed. It indicates that tourism innovation research has a rapidly developing structure. Besides, it is unclear to what extent which study contributes to the literature and tourism application areas [28]. Although there has been an attempt to solve the problem with review studies within the last decade [3,6,27,29–32], the bibliometric studies that depict the comprehensive intellectual improvement process of the innovation field in tourism are quite few [1,2]. Therefore, a need exists for bibliometric studies that reveal the intellectual structure of the field.

Such studies are valuable in terms of indicating the significance of the field, the development trend, showing the extent to which issues need to be studied in the future, and guiding the improvement of the field [27]. Moreover, bibliometric studies assist to reflect the research trends in that field and indicate the research trend in a particular field. This also encourages new researchers who wish to collaborate in that field [1,27].

To better understand the dynamic evolution of innovation research in tourism, we performed a bibliometric analysis using the VOSviewer (version 1.6.16) software to reveal the extent to which tourism innovation studies have been conducted and developed by considering 387 articles in the WoS database (SCI-EXPANDED, SSCI, A&HCI) published over the period 1975–2021. We determined the purpose of the research as to reveal the performance and intellectual structure of the studies on tourism innovation. In order to achieve such an aim, we attempt to find responses to the following questions:

Research questions

RQ1. How do the research studies conducted in the tourism innovation field indicate a change according to time and region (number of publications and citations by years, geographical distribution of publications, h-index, g-index)?

RQ2. What type of distribution do the most productive articles, journals, and authors exhibit in terms of the number of citations?

RQ3. What is the status (common citation and cluster structures) of the most influential research articles, authors, and journals in the field?

RQ4. Which institutions, countries, and authors (author, organization, and country associations) loom large in the cooperation network?

RQ5. Which areas of research seem promising for future research studies?

We organized the rest of the research as follows: the second part constitutes the literature review of the research study. In this part, following the evaluation of the theoretical background of the field as well as the most influential publications, we examine the bibliometric studies in the field. The next part constitutes the research methodology. In this part, we present detailed information regarding the processes that we follow throughout the data collection and analysis process. In the next part, we present the obtained research results, and in the last part, we present the limitations of the research study.

2. Theoretical Background

People in the world have reason to travel. Some travel for business purposes, some for medical purposes in order to obtain good medical care, some travel in order to visit a holy place while some travel to see the natural diversity of life [33]. For that reason, there is no universally accepted definition of what constitutes the tourism industry. Most academic writers tend to craft their definitions to suit their specific purposes [34]. For purposes of this study, the definition given by the Tourism Society is accepted [35]: "Tourism is the temporary, short-term movement of people to destinations outside the places where they normally live and work and their activities during the stay at each destination. It includes movements for all purposes".

Similarly, there is a general lack of consensus on the definition of innovation in tourism. In tourism research, the definitions by Schumpeter [36] and the OECD [37] are frequently used.

Schumpeter [36] accurately defined innovation as "the development and introduction of a new good (product innovation), the introduction of a new method of production (process innovation), the opening of a new market (marketing innovation), new sources in production—that is, new sources of raw material or new semi manufactures (input innovation), and the creation of new organizational forms or industries (organizational innovation).

In the third edition of the OECD Oslo Manual [37], innovation is defined as: "the implementation of new or significantly improved products (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations".

In the articles that we have analyzed in this study, tourism innovation is understood as: "creativity, problem solving and new ways of thinking" [38]. In addition to this definition, Information Communication Technologies (ICTs) that are transforming the tourism industry globally have accepted tourism innovation. For instance, the establishment of the Computer Reservation Systems (CRSs) in the 1970s and Global Distribution Systems (GDSs) in the late 1980s, followed by the development of the Internet in the late 1990s have changed business practices, strategies, and industry structures [39]. In addition, implementing new management structures and new logistics and delivery systems [20], networks, and clusters [40] in tourism are important innovations. Besides this, Abernathy and Clark's innovation approach is adapted for tourism by Hjalager. Accordingly, new investments in larger structures, new combinations of existing products, diffusion of new technology in tourism firms, and exploitation of new resources are accepted as innovations in the tourism field [4].

Although it is thought that manufacturing and technology companies tend to adopt innovations more easily, the tourism sector is among the sectors with the most intense innovation. The traces of this situation are clearly noticed upon taking the development of the sector from past to present into consideration. For instance, Thomas Cook, in compliance with the emergence of the railway infrastructure, developed a concept consisting of travel and entertainment components that appealed to a completely new customer segment by breaking down the mentality of its time and providing services compatible with the solvency of the customer segment to which it addressed. Upon considering the later examples, the films of the Disney company and the theme parks in synergy with the media attracted the attention not only of the local audience, but also of the whole world. Again, Ray Kroc completely transformed the idea of McDonald's' food delivery organization, and the concepts he developed became an inspiration for the entire catering industry [6].

Nonetheless, the classical innovation literature has been mainly manufacturing- and patent-intensive. Much of the early innovation research was driven by the debate concerning the differences between services and manufactured goods. The early research tended to follow an assimilation perspective in which service innovation was assumed to be similar to manufactured goods innovation and could follow the same research theories and frameworks [41,42]. Then, there was a period when service innovation research increasingly focused on the differences between service innovation and manufactured goods innovation by adopting a demarcation perspective; service innovation was no longer considered an activity inherently similar to manufactured goods innovation but a central and separate topic with its own merit [41]. For example, Ettlie and Rosenthal [43] examined differences between goods innovation and service innovation in terms of experience, fundamental nature, and novelty. Using a meta-analysis, Storey, Cankurtaran, Papastathopoulou, and Hultink [44] found that success factors for service innovation are different from those of goods innovation. This debate on the differences and similarities between services and manufactured goods innovation appears to no longer be a major concern [41]; the overarching perspective of most current service innovation research is a synthesis of both the assimilation and demarcation perspectives [43].

Tourism analysts have been late in adopting the theories, concepts, and methodologies which have been well-known in other sectors to the tourism sector [6]. The number of studies on innovation in the tourism literature has drastically increased, especially after the

2000s [3,4,6,7,9–12,32,45–49]. These developments in the literature indicate that tourism innovation studies have reached a level that can compete with innovation studies in the manufacturing industry [6]. As a result of such an increase, various research studies have been conducted concentrating on the benefits of innovation in different areas of the sector for tourism businesses and destinations [2].

It is seen that the majority of the most cited studies in this field within the last two decades investigated the impacts of technological innovations; Stamboulis and Skayannis [48] revealed the contribution of innovations in technology and digital transformation to the improvement of tourism. Similarly, Buhalis and Law [50] examined the studies of the last two decades in the field of e-tourism and emphasized the extent to which the internet and other digital technologies have changed the tourism industry. In compliance with the results of this study, Aldebert et al. [51] emphasized that technological improvements and information and communication technologies developing in parallel steered innovations to comprehend the improvements in the field of tourism innovation through the Tourism@ trade fair. Utilizing the Unified Theory of Acceptance and Use of Technology (UTAUT), San Martín and Herrero [10] found that rural tourism service users played a key role in user innovation in their online purchasing tendencies. Guttentag [9], in his study of the emergence of the sharing economy and its impacts on the tourism sector, found that Airbnb had a devastating impact on the conventional accommodation sector. Tussyadiah [11] concluded that travelers utilized technological innovations (smartphones) during their travels, based on the Diffusion of Innovation and Technology Acceptance Theories. Technological innovations were used for entertainment, social networking, and navigation. Similarly, using the same theories, Agag and El-Masry [45] indicated that innovation facilitated participation in online travel communities; hence, a positive attitude towards purchasing, as well as a tendency to recommend, emerged. In another study, Kumar and Shekhar [52] revealed that the use of technology in tourism could serve the development of rural tourism and rural tourism could serve the purpose of socio-economic development. Furthermore, Bartoli et al. [53] underline the potential of gamification in tourism for children. Similarly, Pasca et al. [54] have investigated the importance of the use of gamification strategies in the tourism sector. In another study, Sigala [55] unravels the transformative power of technologies on the tourism actors. In addition to these studies, creativity is seen as the most important supporter of innovation. For instance, according to Bayik and Kuo [56] in the tourism industry, a creative employee is a valued asset that can aid companies in developing unique and innovative product/service solutions.

Another element addressed in tourism innovation research studies has been knowledge sharing. Hu et al. [57] discussed knowledge sharing at the level of hotel employees and found that knowledge sharing among employees and team culture fostered service innovation performance. Weidenfeld et al. [12], on the other hand, discussed knowledge sharing at the destination level and stated that knowledge sharing among nearby destinations would have been easier and that would have offered an opportunity for innovation. Another study that may be related to this study, Novelli et al. [40] examined the relationship of the network and clustering approach with innovation in small and medium-sized enterprises. In this study, it was emphasized that this approach facilitated innovation and maintained a competitive advantage for tourism enterprises.

A body of research has focused on the managerial ability and performance of innovation. Orfila-Sintes et al. [47] stated that larger hotels were more innovative than small enterprises. Similarly, comparing enterprises in Spain and Denmark, Sundbo et al. [49] emphasized that large size and professionalism had positive impacts on innovation ability. These studies argue that innovation in the tourism businesses may vary according to the size of the enterprise. Another factor that increases the innovation abilities of tourism enterprises is the personnel. At this point, Chang et al. [14], drawing attention to the importance of human resource management practices, stated that personnel selection and training had significant and positive impacts on both radical and incremental innovation.

Again, one of the remarkable studies in the literature indicated that manufacturing sector enterprises were more innovative than tourism sector enterprises. Incremental innovation is mostly achieved in tourism enterprises [58]. In addition, in another remarkable study on wine family businesses, Vrontis et al. [59] emphasized that innovation could be disconnected from tradition, and the combination of the two was crucial in achieving sustainable competitive advantage. Setting out from the Actor-Network Theory, Paget et al. [7] underlined that the relations and cooperation of tourism destinations with human and non-human beings were crucial in producing innovative outputs.

3. Bibliographic Studies on Innovation in Tourism

Review studies on tourism innovation tend to attract a great deal of attention. Theoretical studies were initiated with Hjalager [4,6,60]. The researcher defined the types of tourism innovation in her study published in 2002 and examined the innovation studies that were conducted up to that time in her theoretical study published in 2010. Those studies claimed that there was little systematic and comparative empirical evidence examining the impacts of innovation on the destination and the country's economy. In his study published as of 2015, Hjalager presented a brief, systematic and analytical account of 100 innovations that significantly affected tourism, although they were not developed directly for tourism. According to the author, many of these tourism innovations have been adapted from other sectors. Williams and Shaw [32] interpreted internationalization as both an innovation and a promoter of innovation. Medina-Muñoz et al. [30] made efforts to find responses to the questions of how to aggregate tourism innovation performances in China and Spain and how to improve innovation studies in tourism by analyzing 117 studies over the period 2000–2011. In another review, Kandampully et al. [61] asserted that creativity and innovation could have emerged in the hospitality industry with the integration of people (climate, culture) and technology (information technology, social media). In this regard, they proposed a technology hybrid business model that advocated the coexistence of these two elements. As a result, they stated that technology was essential for innovation, but technology alone was not sufficient for the innovation of an enterprise, and no need for brains that could use and direct such technology existed.

In another study, Pikkemaat et al. [27], reviewing tourism innovation studies, stated that researchers should have concentrated on issues such as the impacts of innovation, eco-innovation, policy, and governance on innovations as well as open innovation processes in small businesses. In another study conducted in the same year, Bagiran Ozseker [29] published an integrated review and proposed a destination innovation process model by utilizing five types of innovation literature (cluster theory, innovation systems, network relations, knowledge management, and innovation types). With this, it aimed to expand the thoughts on the destination innovation process for tourism-related units at both local and national levels. This study indicated the extent to which tourism destinations could improve their innovation capabilities. A similar integrative theoretical review was made by Trunfio and Campana [62]. The authors proposed an integrated theoretical framework for innovation in tourism destinations. The authors identified four innovations generated by communication among information and communication technologies, social capital, and tourism actors: experience co-creation, smart destinations, e-participatory governance, and social innovation. As one of the most interesting studies, Eide et al. [63] dealt with the difficulties encountered in sustaining innovations in an experience concept. In this study, researchers have noticed that for an innovation to become an experience concept, some elements must be permanent, some procedures must be fixed, and the stories told about the experience must be reproducible later on. They provided a framework for comprehending the experience problem. Montresor [28] composed a description of tourism innovation studies conducted within the last two decades. The author critically reviewed the available literature and tried to bring forth his contributions to the following literature by maintaining a synthesis of different views. Sharma et al. [31] presented a systematic review of eco-innovation studies in tourism over the period 1998–2018. As a result of the

research, 403 studies were analyzed and homogeneous themes were determined. Seven research areas were identified under eco-innovation practices: Eco-efficient strategy, Green consumerism, CSR and outreach, Carbon management, Eco-labels, Management/employee engagement, Analysis, and evaluation. In another study, Li and Hsu [64] explicated the innovative behavior of working in the service industry by considering top tourism journals published over the period 1995–2014. They summarized the studies conducted on innovative business behavior and made recommendations regarding the antecedents and consequences of the EIB.

Although there are many review studies on the issue of tourism innovation, it is seen that not many of them involve bibliometric studies. Upon examining top tourism journals, five studies attract attention. The first study was conducted by Gomezelj in 2016. In this study, the researcher obtained nine co-citation networks, or clusters by applying co-citation relations among the most cited authors. These clusters were as follows: "fundamental studies" "RBV and competitive advantage" Organization studies, Networking, Innovation in services, Innovation systems, Knowledge, Management of organizational innovation and Technology. Teixeira and Ferreira [65] examined the articles and citations related to "regional competition and tourism innovation" over the period 1900–2016. The results indicated the extent to which the intellectual structure on regional competitiveness and tourism innovation has evolved over time. Major research trends were identified, deficiencies were identified, and suggestions for future studies were presented. In the same year, Marasco et al. [66] conducted a systematic review of collaborative innovation studies in the field of tourism. Seventy-nine articles were reviewed utilizing the Scopus, Web of Science, EBSCO host's Hospitality and Tourism Complete, Emerald Management eJournals, and Sage Journals databases. Five groups of articles were identified as a result of the research study based on the qualitative thematic analysis:, co-creation, collaborative behavior of innovating firms, knowledge transfer, collaboration networks for innovation, and innovation policies. In another bibliometric study, Durán-Sánchez et al. [1] reviewed the Scopus and WoS databases and analyzed 264 and 211 studies, respectively. Hjalager was highlighted as the most influential author in the field of tourism innovation, The Tourism Management was declared as the most influential journal, whereas Spain, the UK, and Denmark held the top positions in the country rankings. Consequently, Núñez-Tabales et al. [67] provided a bibliometric analysis of research on Airbnb over the last decade and asserted that satisfaction, trust, and innovation formed the basic research links.

Building on the previous review studies on tourism innovation, this study attempts to provide a comprehensive overview on the intellectual structure of innovation research in the tourism fields. More specifically, this study presents a bibliometric analysis of 387 research studies, which was published over the period 1975–2021 and cited in SCI-EXPANDED, SSCI, A&HCI indexes of WoS.

4. Material and Methodology

Bibliometric methods aim to increase/develop knowledge in a field of science by guiding the researcher through relevant studies in a research field and their mapping [68]. It involves a relatively new methodology compared to the conventional systematic literature review. It is comprised of analyzing the scientific production in a particular discipline and a quantitative evaluation of the inter-publication relations through statistical estimations [69]. Two techniques, relational or evaluative, have been generally used in bibliometric studies [70]. In this study, we utilize evaluative techniques such as the number of articles and citations by year, publications per author, and relational techniques, such as co-citation and co-occurrence, which explore the relationships within the research. Based on the results of such analyses, we provide a key agenda for future tourism innovation research.

The data of this research study consists of the articles published between the years 1975 and 2021 in the journals cited in the SCI-EXPANDED, SSCI, and A&HCI indexes in the Web of Science Core Collection (WoS) database as of December 2021. This database,

along with Scopus, is one of the two most important databases and high-standard articles are published in journals cited in the SCI-EXPANDED, SSCI, and A&HCI indexes [71].

In Table 1 we present the criteria and the filter that we used in our data collection. In retrieving the articles to be examined within the scope of the research, we used the keywords "innovation" and "tourism", taking Gomezelj [2] as an example. For the purpose of better accuracy in determining the sample database, we used the guidelines of PRISMA, proposed by Moher et al. [72]. This approach indicates four steps to identify and extract the data for a bibliometric review (Figure 1). We inserted the term "innovat*" in the title part, and "tourism*" in the topic part. We carried out the research by limiting the publication language of the documents to merely English so that we can better capture co-citation networks. As a result of this phase, we reached 498 documents. Then, we included documents in the type of "Article, Review, Early Access" within the scope of the research, and excluded documents of the types "Proceedings Paper, Correction, News Item, Book Review, Letter, Editorial Material, Meeting Abstract". As a result of this stage, we reached 466 articles. We manually reviewed each articlem identified 79 publications that are not related to innovation in tourism and excluded them from the analysis. Thus, a total of 387 articles are included in the analysis.

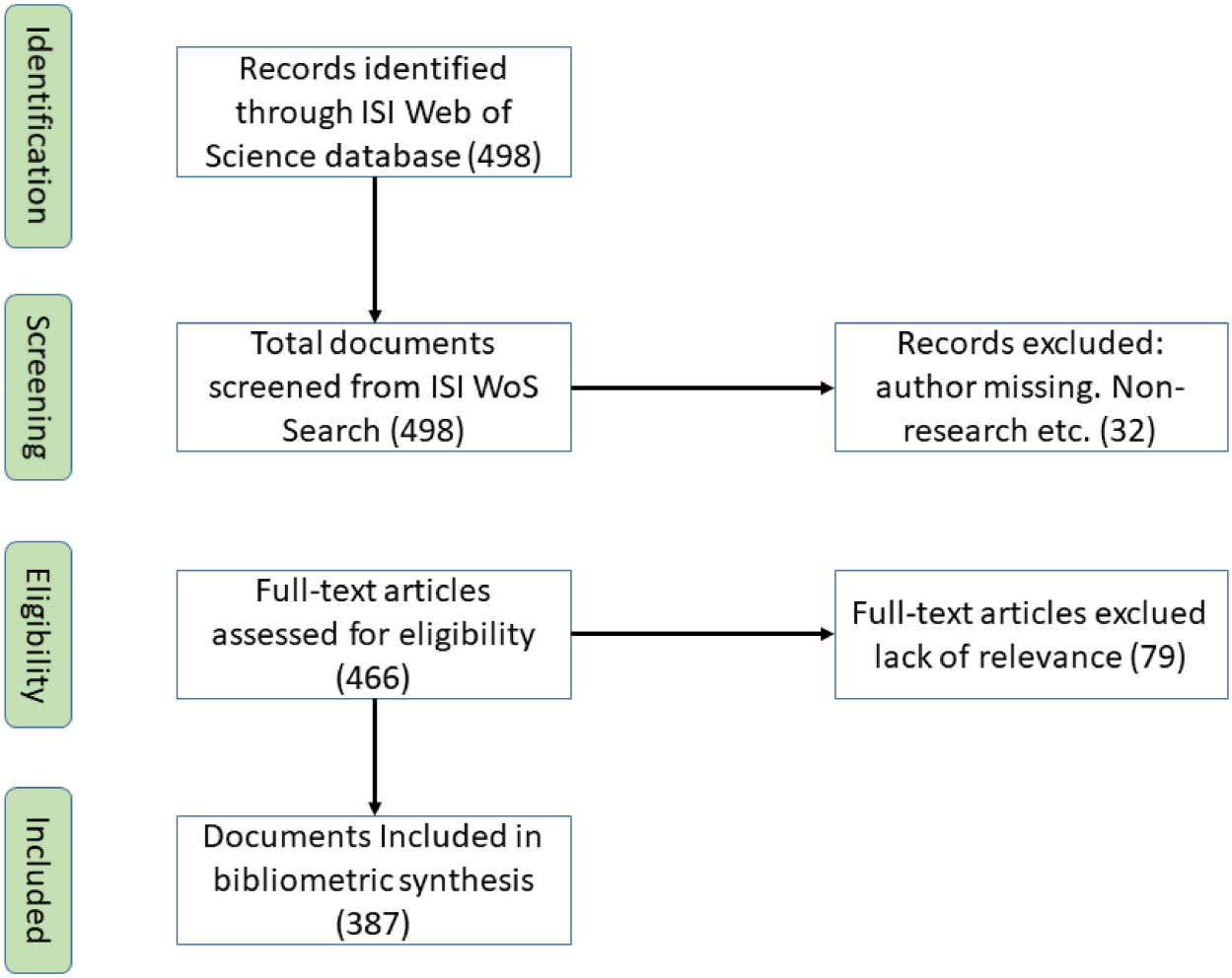

Figure 1. The PRISMA flow diagram used to identify, screen and include papers for our bibliometric review.

Table 1. WoS database Search Summary (1975–2021).

Keywords	Field	Type of Document	Index	language	Quantitiy
"innovate *" "tourism *"	Title Topic	All	SCI-EXPANDED SSCI, A&HCI	English	498
"innovate *" "tourism *"	Title Topic	Journal Article	SCI-EXPANDED SSCI, A&HCI	English	466

Source: Authors.

Publish or Perish (h-index, g-index), Excel (average citations per year and article, average number of articles per author, change of articles and citations by years), and MapChart (by countries on the map, number of publications) software are employed in visualizing the bibliometric indicators of the articles to be analyzed. Besides bibliometric visualization of the data, science mapping is used to map the data utilizing VOSviewer (version 1.6.16) software [73]. After transferring the data to the VOSviewer software, 4 visual maps are created based on 3 co-citations and 1 co-word. Co-citation maps are composed of co-cited articles, journals, and authors. Co-word maps are composed of the words that commonly appear in the research and the temporal representation of these words. Co-citation refers to the link between documents cited by the same document [74]. Co-occurrence refers to the number of times an author's keyword appears in close association with another within publications in the dataset [73]. VOSviewer software is based on the use of nodes and lines (links) (Seguí-Amortegui et al., 2019). Nodes may represent authors, journals, countries, institutions, references, and keywords. Links between nodes may also indicate citations, co-citations, collaborations, and co-occurrences. Cluster analyses indicate networks and assist in revealing groups and trends. Therefore, in this study, we show the co-occurrence of keywords as well as co-cited articles, journals, and authors. These analyses are widely used in the bibliometric studies literature [71]. The size of a node indicates that the weight of that node is large, such as the article, author, or document it represents. Clusters of the same color form a set, and the elements of this set are closely correlated. Bold links indicate intense collaboration [75].

5. Results

For the 387 articles included in the analysis, the h-index and g-index were 46 and 91, respectively. A total of 10,388 citations are made to these articles. The mean value of citation per article is 26.84. The mean value of citation value by year is 432.83. According to Figure 2, a steady increase is observed in the number of citations to articles in the field of tourism innovation, especially after the year 2008. Nevertheless, there have been fluctuations in the number of articles over the years.

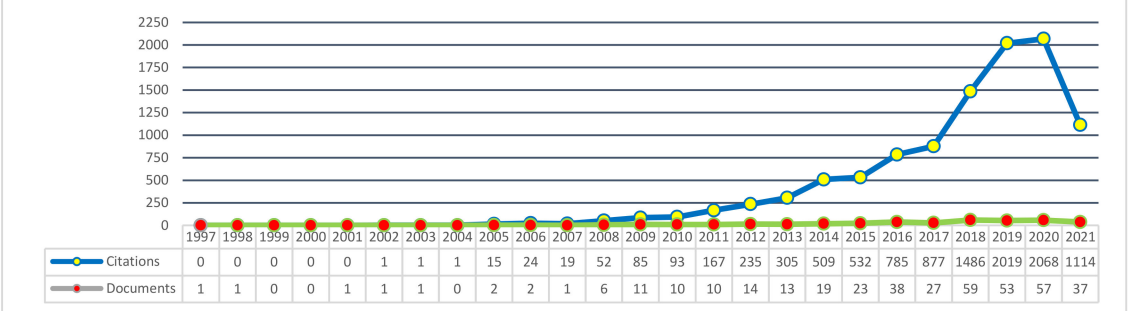

Figure 2. Number of articles and citations by year.

Figure 3 illustrates the geographical distribution of studies in 14 countries. The number of citations and publications is indicated in front of the country names. Accordingly, the most productive country is Spain, followed by China, the USA, Taiwan, and the UK,

respectively. On the other hand, this ranking order is subject to change upon considering the numbers of citations received by the countries. According to the citation ranking, Spain (1971) ranks first. Denmark ranks second (1582), whereas the UK ranks third (1522). The USA (1146) and Canada (965) follow, respectively. Although China has the second rank in the publication order, it ranks last in the citation order.

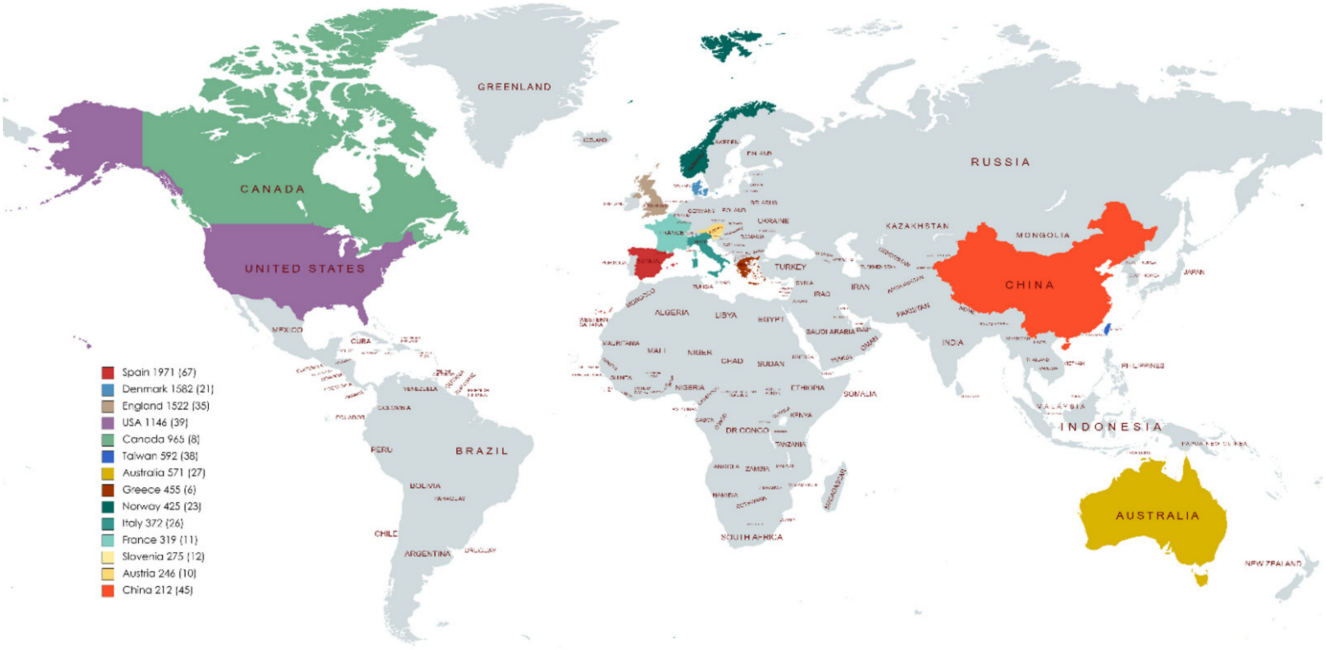

Figure 3. Academic production by country, from 1975–2021 (software Mapchart) (https://www.mapchart.net/world.html, accessed on 24 May 2022).

Upon considering the classification of the articles according to the citations they received, the study entitled Airbnb: disruptive innovation and the rise of an informal tourism accommodation sector [9] ranks first. This study is followed by A review of innovation research in tourism [6] and Networks, clusters, and innovation in tourism: A UK experience [40]. It is also observed that Hjalager has two publications in this classification (Table 2). The results show that disruptive innovation for the sharing economy is a key research agenda and literature review studies have provided foundational knowledge to following tourism innovation studies.

Table 2. Top 15 Most Cited Articles.

R	Author	Title	Year	Age	TC	C/Y
1	Guttentag, D.	Airbnb: disruptive innovation and the rise of an informal tourism accommodation sector	2015	6	638	106.33
2	Hjalager, A.M	A review of innovation research in tourism	2010	11	635	57.73
3	Novelli, M.	Networks, clusters and innovation in tourism: A UK experience	2006	15	408	27.20
4	Hjalager, A.M	Repairing innovation defectiveness in tourism	2002	19	356	18.74
5	Stamboulis, Y.	Innovation strategies and technology for experience-based tourism	2003	18	353	19.61
6	Tussyadiah, IP.	The influence of innovativeness on on-site smartphone use among American travelers: implications for context-based push marketing	2016	5	330	66.00

Table 2. *Cont.*

R	Author	Title	Year	Age	TC	C/Y
7	Hu, MLM.	Hospitality teams: Knowledge sharing and service innovation performance	2009	12	266	22.17
8	Sundbo, J.	The innovative behavior of tourism firms—Comparative studies of Denmark and Spain	2007	14	242	17.29
9	Martin, HS.	Influence of the user's psychological factors on the online purchase intention in rural tourism: Integrating innovativeness to the UTAUT framework	2012	9	231	25.67
10	Orfila-Sintes, F.	Innovation activity in the hotel industry: Evidence from Balearic Islands	2005	16	213	13.31
11	Camison, C.	Measuring innovation in tourism from the Schumpeterian and the dynamic-capabilities perspectives	2012	9	182	20.22
12	Agag, G.	Understanding consumer intention to participate in online travel community and effects on consumer intention to purchase travel online and WOM: An integration of innovation diffusion theory and TAM with trust	2016	5	137	27.40
13	Gomezelj, D.O.	A systematic review of research on innovation in hospitality and tourism	2016	5	127	25.40
14	Aldebert, B.	Innovation in the tourism industry: The case of Tourism@	2011	10	122	12.20
15	Williams, AM.	Internationalization and innovation in tourism	2011	10	119	11.90

R = rank; TC = the total number of citations received by the published articles; C/Y = average citations received by years. Source: Own elaboration.

Upon examining the most efficient journals in terms of the number of citations, the Journal of Tourism Management ranks first in terms of both the number of citations and the number of publications. This journal is followed by Current Issues in Tourism and Annals of Tourism Research (Table 3).

Table 3. Top 15 Most Journals.

R	Journal Title	TC	fi	%	h	Q
1	Tourism Management	3829	33	8.52	24	Q1
2	Current Issues in Tourism	860	20	5.68	9	Q1
3	Annals of Tourism Research	624	10	2.58	8	Q1
4	International Journal of Contemporary Hospitality Management	606	28	7.23	14	Q1
5	International Journal of Hospitality Management	544	19	4.90	14	Q1
6	Journal of Travel & Tourism Marketing	355	6	1.55	3	Q1
7	Journal of Sustainable Tourism	353	13	3.35	8	Q1
8	Journal of Travel Research	285	12	3.10	7	Q1
9	Scandinavian Journal of Hospitality and Tourism	250	14	3.61	10	Q2
10	Service Industries Journal	210	10	2.58	6	Q3
11	Sustainability	196	32	8.26	10	Q2
12	International Journal of Tourism Research	147	7	1.80	5	Q2
13	Journal of Cleaner Production	106	5	1.29	4	Q1
14	Tourism Economics	104	10	2.58	6	Q3
15	Journal of Hospitality & Tourism Research	86	6	1.55	4	Q1

fi = frequency (number of articles published); TC = the total number of citations received by the published articles; h = Hirsch's index; Q = quartile. Source: Own elaboration.

Table 4 presents researchers with at least five publications. Accordingly, upon considering the most productive researchers in terms of the number of citations and articles, Anne-Mette Hjalager has the highest number of publications and citations. This researcher is followed by Francina Orfila-Sintes and Allan M. Williams.

Table 4. The Most Productive Authors.

R	Name	Affiliation	Country	fi	LA	SA	TC	C/P	h
1	Hjalager, Anne-Mette	Univ. of Southern	Denmark	14	11	3	1330	95	8
2	Orfila-Sintes, Francina	Univ Balearic Islands	Spain	5	0	5	425	85	5
3	Williams, Allan M.	Univ. of Surrey	UK	9	2	7	370	41.11	6
4	Horng, Jeou-Shyan	Jinwen Univ Sci & Technol	Taiwan	5	1	4	313	62.6	4
5	Elche, Dioni	Univ Castilla La Mancha	Spain	6	1	3	133	22.16	6
6	Garcia-Villaverde, Pedro M.	Univ Castilla La Mancha	Spain	6	1	3	133	22.16	6
7	Martinez-Perez, Angela	Univ Castilla La Mancha	Spain	6	4	0	133	22.16	6
8	Liu, Chih-Hsing	Ming Chuan Univ	Taiwan	6	1	1	82	13.66	4

R = rank; fi = frequency (number of articles published); LA = Lead Author; SA = Second Author; TC = the total number of citations received by the published articles; C/P = average citations received by the published articles; h = Hirsch's index. Source: Own elaboration.

5.1. Co-Citation Analysis

Co-citation analysis is performed to detect correlated articles, authors, and journals. Co-citation analysis uses co-citation counting to establish similarity measures among documents, authors, or journals. Co-citation is defined as the frequency with which two units are cited concurrently. The basic assumption of co-citation analysis is that when two units are cited more concurrently, their content is more likely to be correlated. Co-citation analysis can be performed in different types according to the document, author, and journal [68].

5.2. Co-Cited of References

Figure 4 illustrates the co-citation relationship of the documents. Accordingly, 48 documents with at least 20 out of 19,414 citations are identified. In terms of the number of citations and link strength, Hjalager's work entitled A review of innovation research in tourism, published in Tourism Management Journal in 2010, ranks first. This article has 144 citations and a total of 139.00 link strength. The work of the same author entitled Repairing innovation defectiveness in tourism, which was published in the same journal in 2002, ranks second. This reference has 86 citations and 84 total link strengths. The references constitute three clusters, in red, green, and blue, according to their relationship frequency. The first set is in red and consists of 20 documents. Hjalager's work, which was published in 2002, ranks first in this cluster in terms of the number of citations. This cluster mostly concentrates on the meaning and types of tourism innovation. The second set is in green and consists of 15 documents. The most cited article of this cluster with the highest link strength is Hjalager [6]. This cluster mostly concentrates on review studies on innovation and innovation measurement in hotel businesses. The third cluster in blue color consists of 13 documents. In this cluster, there is a study entitled Evaluating structural equation models with unobservable variables and measurement error, published by Fornell and Larcker in the Journal of Marketing Research in 1981, with 57 citations and 54 total link strength. This cluster mostly contains methodological documents, which represents that new methodological approaches and processes are associated with a body of tourism innovation studies.

5.3. Co-Cited of Journals

After the reference network, the focus is on the journal network. Accordingly, 163 co-cited journals out of 7581 journals with at least 20 citations are identified. Figure 5 illustrates the co-cited journal network. According to the co-cited journal analysis, three clusters are found. The first set is in red and contains 62 journals. This cluster is comprised of the International Journal of Hospitality Management (total link strength 542.58, 598 citations), International Journal of Contemporary Hospitality Management (total link strength 384.27, 413 citations), and Journal of Business Research (total link strength 334.96, 353 citations). The second cluster is in green and contains 58 journals. In this cluster, Tourism Management (total link strength 1541.22, 1852 citations), Annals of Tourism Research (total link strength

617.84, 682 citations), and Research Policy (total link strength 360.45, 388 citations) are the top three journals in terms of the number of citations and total link strength. The third cluster is in blue. The most co-cited journals in this cluster are Strategic Management Journal (total link strength 298.78, 318 citations), Academy of Management Journal (total link strength 233.87, 245 citations), and Academy of Management Review (total link strength 229.84, 238 citations), respectively. These results indicate that the three groups of journals in terms of hospitality, tourism, and management topics are the basis of tourism innovation research. Interestingly, the broader management journals have been some of the main knowledge sources for tourism innovation, reflecting the interdisciplinary nature of tourism innovation research studies.

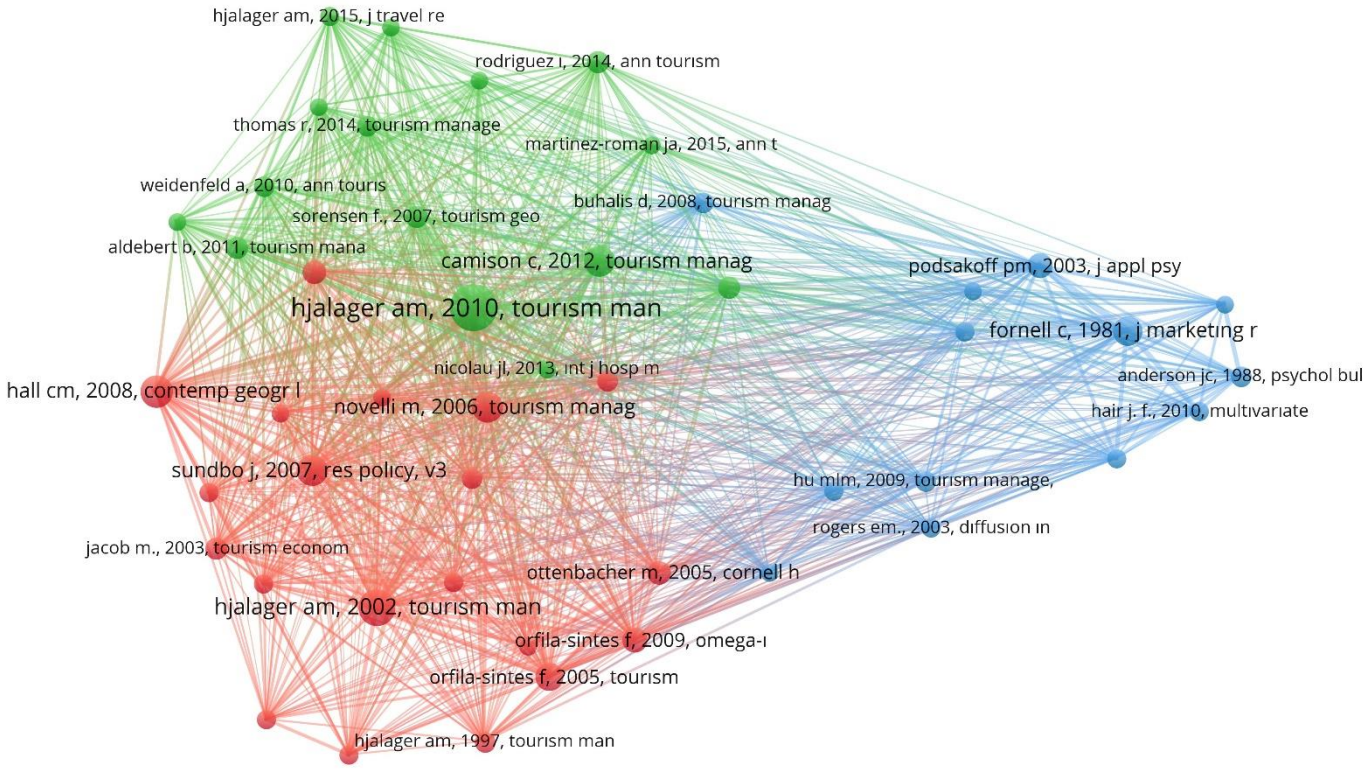

Figure 4. Co-citation of cited references on tourism innovation.

5.4. Co-Cited of Authors

Co-citation analysis continues with the determination of the co-cited of authors network (see Figure 6). Out of 13,264 authors, 119with at least 20 citations are found. As a result of the analysis, four clusters are determined as red, blue, yellow, and green. The red cluster ranks first and consists of 37 authors. This cluster is coined by Anne-Mette Hjalager (total link strength 374.84, 417 citations), Francina Orfila-Sintes (total link strength 89.77, 93 citations), and César Camisón (total link strength 90.08, 91 citations). The second set in green has 32 authors. In this group, Colin Michael Hall (total link strength 118.73, 128 citations), Dimitrios Buhalis (total link strength 72.51, 82 citations), and OECD (total link strength 86.95, 95 citations) are in the top three in terms of co-citation and total link strength. The third cluster is in blue and consists of 29 authors. At the head of this cluster are researchers who conduct studies on research methodology. Joseph F. Hair, Jr. (total link strength 76.82, 80 citations), Everett Mitchell Rogers (total link strength 65.86, 73 citations), Claes Fornell (total link strength 65.24, 66 citations), and Philip M Podsakoff (total link strength 55.89, 58 citations) are the leading researchers of this cluster. Finally, the fourth cluster is in yellow and has 21 authors. Jon Sundbo (total link strength 135.17, 145 citations), Faïz Gallouj (total link strength 55.90, 58 citations), and Fariborz Damanpour (total link strength 47.51, 50 citations) are at the head of this cluster.

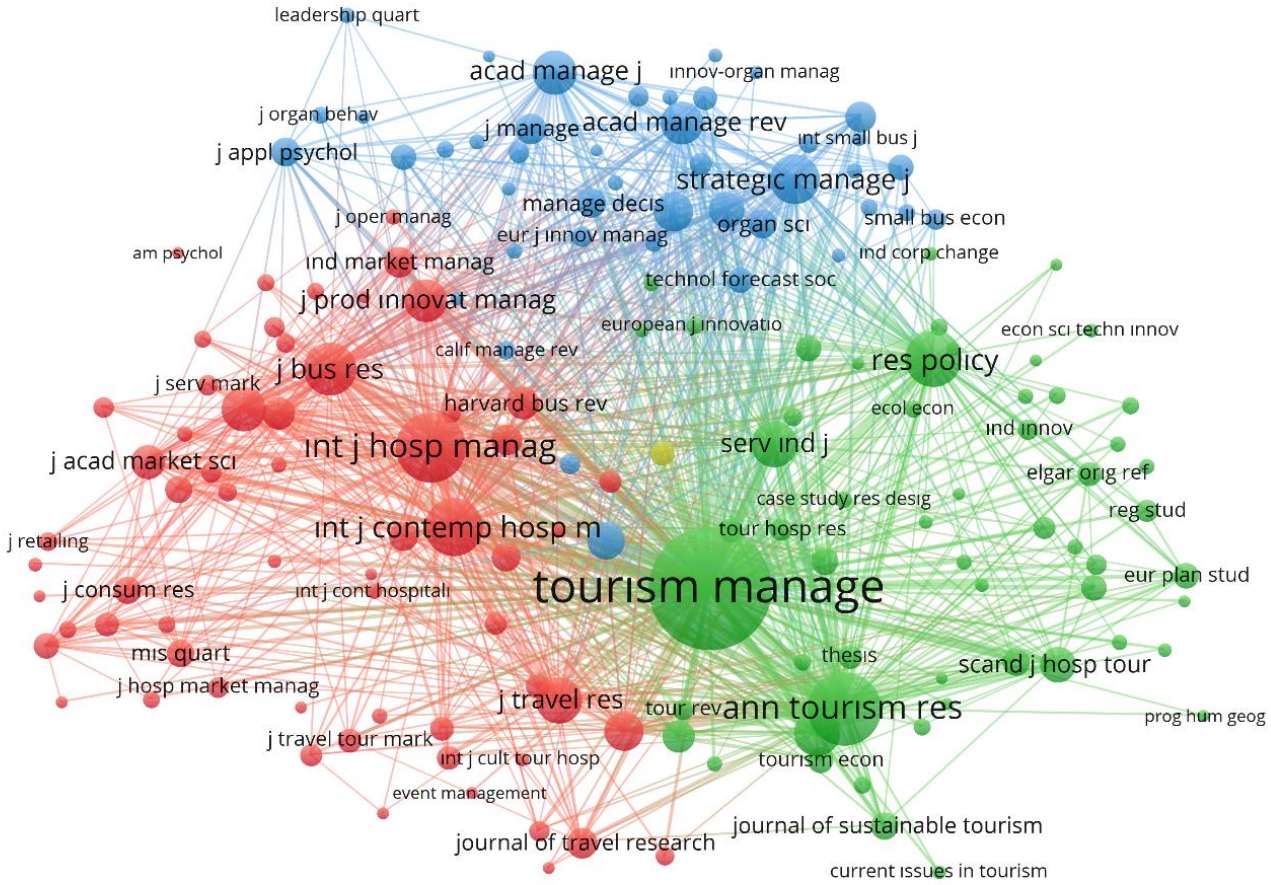

Figure 5. Co-citation of cited journals on tourism innovation.

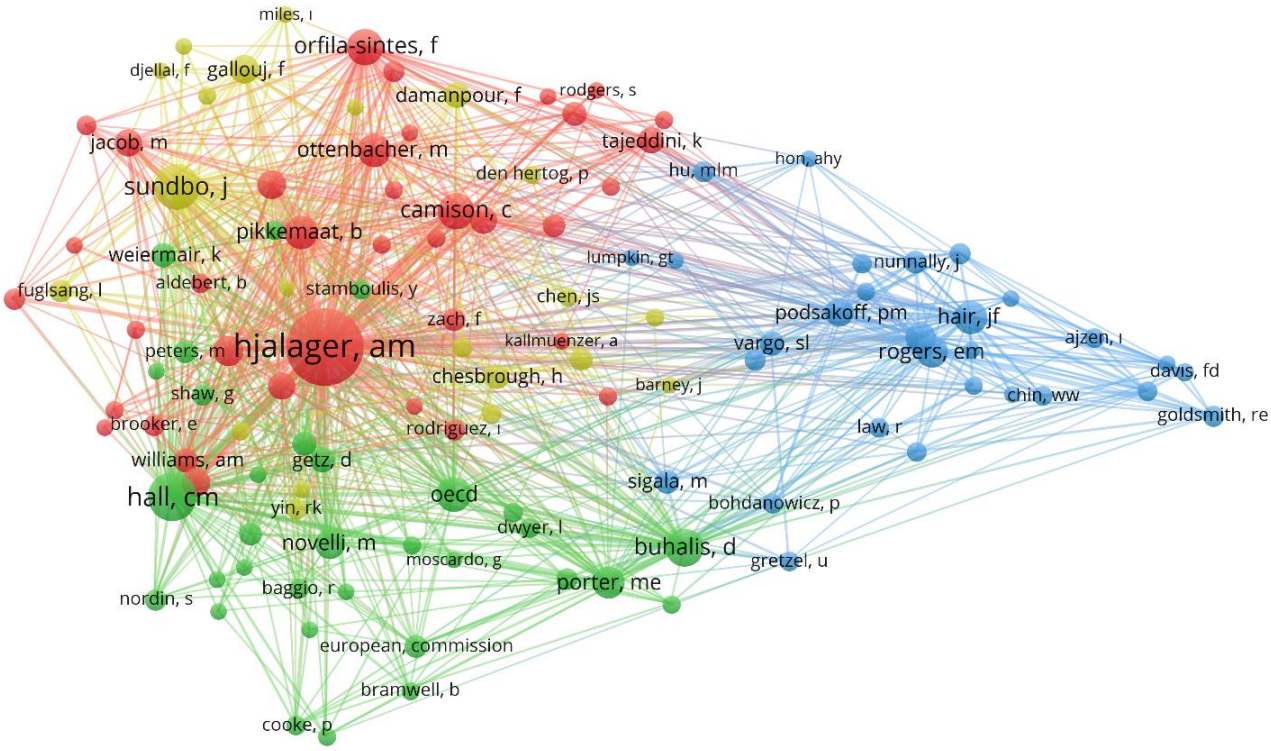

Figure 6. Co-citation of cited authors on tourism innovation.

5.5. Co-Authorship

We perform a co-authorship analysis to determine the collaborating authors, organizations, and countries. Accordingly, we identify 8 out of 901 authors with at least five publications. Figure 7 illustrates this collaboration network among authors. The most collaborative researchers are Angela Martinez-Perez, Dioni Elche, and Pedro M. Garcia-Villaverde. Besides, Jeou-Shyan Horng and Chih-Hsing Liu are also co-authors. There is no co-authorship among other researchers.

Figure 7. Co-authorship network.

Upon examining the organization partnership, it is seen that there are 17 organizations with at least five publications out of 534 organizations. In terms of the number of publications, the University of Surrey (14 documents) ranks first in terms of the number of citations, whereas the University of Southern Denmark (741 citations) ranks first. Figure 8 illustrates the institutional collaborations. Accordingly, the University of Surrey has collaborated with the University of Alicante and the University of Southern Denmark. In terms of country cooperation, we identify 26 out of 70 countries with at least five publications. Figure 9 illustrates the country's cooperation network. Accordingly, countries constitute five clusters. The first cluster in red includes Spain, Denmark, the UK, Portugal, Finland, Poland, Norway, and Sweden. In this cluster, Denmark, Poland, Norway, and Sweden are the countries with close cooperation. The UK, on the other hand, seems to cooperate more with Spain. The second cluster in green includes Italy, the USA, Turkey, Canada, Germany, Slovenia, and the Netherlands. The closest cooperation network in this cluster is among Italy, the USA, and Turkey. The third cluster is in blue. This cluster includes China, Taiwan, Austria, and Pakistan. In this cluster, Austria is the least cooperating country. The fourth cluster is in yellow and consists of France, Greece, South Korea, and India. In this cluster, India and Greece are the countries that cooperate most frequently. Finally, the purple cluster consists of Australia, Malaysia, and New Zealand. There is close cooperation between Australia and Malaysia in this cluster.

Figure 8. Institutional partnership.

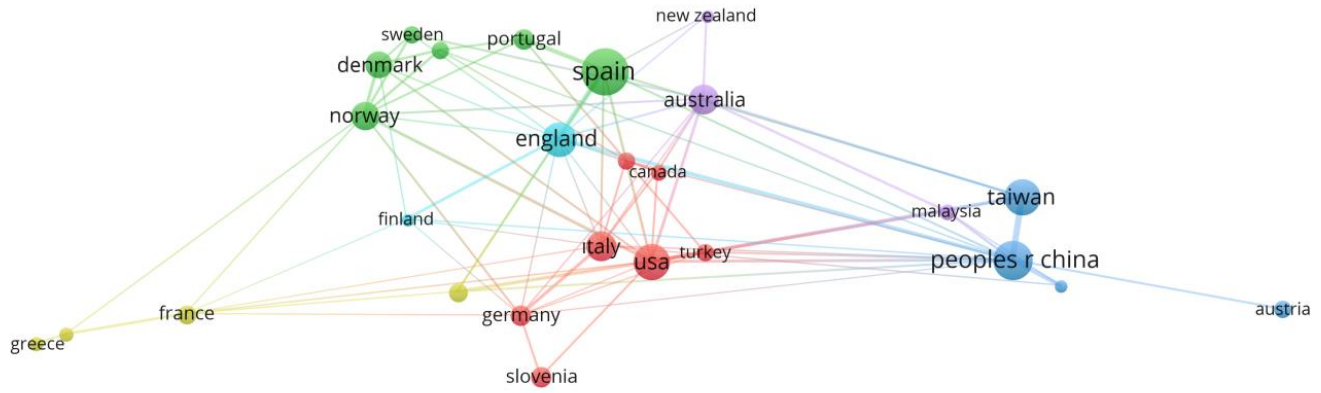

Figure 9. Country cooperation network.

5.6. Co-Occurrences of Keywords

Co-word analysis is a content analysis technique that uses words in a document to establish relationships and construct the conceptual structure of the field. The rationale behind the method is that the frequent co-occurrences of words in the document means closely correlated concepts/thoughts behind the words. While other methods link documents indirectly through citation and co-authorship, this is the only method that uses the actual content of the documents to establish a similarity measure. The output of the co-word analysis is the network of themes representing the conceptual domain of a field and their relationships with each other. This semantic map helps the comprehension of its cognitive structure. These maps can be applied to the document title, keywords, abstracts, or full manuscript to monitor changes in the conceptual structure of a field [75].

In this study, we conduct co-occurrences of keywords/co-word analysis to determine which topics indicate a trend in the field of tourism innovation. We detected some inconsistencies in the use of the same keywords in the dataset. We transform the inconsistencies that affected the analysis result (innovativeness–innovativeness; innovations–innovation; hotels–hotel; smes–sme; restaurants–restaurant) into a single form [70]. In order to better reveal the word map related to tourism innovation, we excluded the words *innovation* (120) and *tourism* (58), which are often found concurrently. According to this, 36 out of 1265 keywords meet the condition of being concurrent with another word at least five times. The most frequent co-words in the dataset are service innovation (23), hospitality (20), innovativeness (19), hotel (17), rural tourism (14), tourism innovation (13), social capital (12), hotel industry, and sustainability (9). We created a temporal keyword co-occurrence overlay map to determine in which direction the topics are trending by years. Figure 10 illustrates recent trends in the tourism innovation literature. Accordingly, the first level of topics researched in the tourism innovation literature consists of *sharing economy*, *open innovation*, *COVID-19*, *sustainability*, *network*, *technology*, *co-creation*, *absorptive capacity*, which are shown in yellow. These results indicate the topics in which researchers have been interested recently.

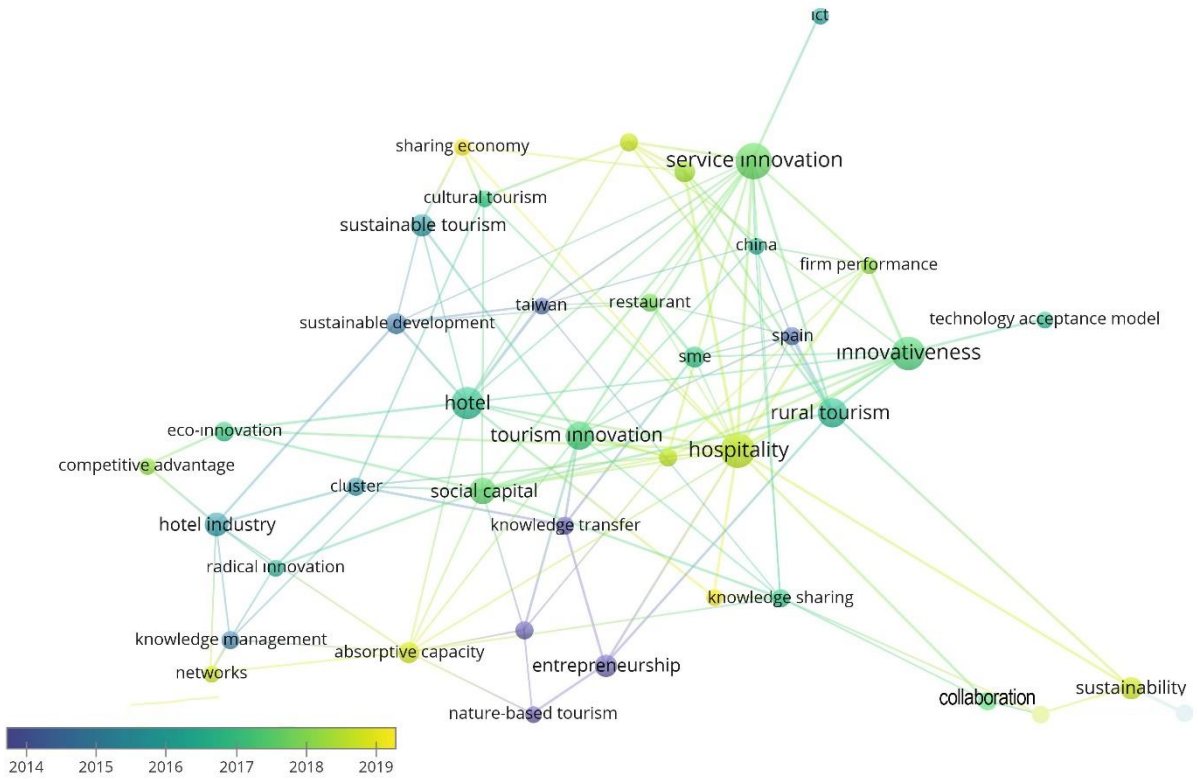

Figure 10. Temporal overlay on a keyword co-word occurrence map for innovation in tourism.

6. Discussion

Researchers are professing more and more interest in the field of tourism innovation each year [27]. Nonetheless, studies in the field are scattered. It is unclear which topics are more crucial, which fields of study are still popular, and which subjects would gain importance for the future [3,5,28]. This situation renders it difficult for researchers to identify new fields of study and for sector managers to make future development plans [2]. For these reasons, in this study, in order to fill this gap, we examine the performance and intellectual development process of articles in the field of tourism innovation from 1975 to the present with bibliometric analysis.

The academic literature in the field of tourism innovation has developed especially after the 2000s. The first study was conducted in 1997 (WoS) [76]. However, the real development in this field began following the year 2008. Afterward, it is seen that the interest in the field has continued to increase so far. This is an indication of the fact that studies in this field would continue to increase in the future. Although Hjalager [6] stated that the studies in this field have reached a level that could compete with other sectors, academic studies in the field of tourism innovation are still new compared to other sectors, as well-put by Durán-Sánchez et al. [1]. Gomezelj [2] stated that it was due to the unique characteristics of the sector: production and consumption are simultaneous in the tourism sector, it is a knowledge-intensive sector, and the human factor is quite crucial. Tourism products are intangible and perishable. Therefore, the way in which innovations are handled in the tourism sector differentiates from other industrial areas.

Furthermore, Spain, Denmark, the UK, and the USA are the most productive countries for innovation in tourism. Although China is not in the top four countries in terms of citations, it follows Spain in terms of the number of publications. The fact that most of the publications were made within the last few years has been effective in the low number of citations to publications from China. Spain and China are two countries that attach importance to improvement in the field of tourism innovation. They concentrate on research and development activities in this area [30]. Furthermore, the World Tourism Organization stated that Spain, China, the USA, and the UK were among the top 10 destinations [77]. Although there is no data on the extent to which tourism practitioners of countries make innovation plans by utilizing the results of academic research studies, this result indicates the importance these countries attach to tourism innovation. Anne-Mette Hjalager had a great influence on Denmark following Spain in terms of citation in the field of tourism innovation. This situation indicates that the significance of a researcher is in determining the rank of a country in the field of science.

In addition, research studies are categorized into three groups in terms of co-citation; it is possible to categorize the first two groups as the first-term and the second-term studies. The third group is methodological research. The first-term studies tend to reveal the theoretical structure of the field. While the second-term studies are mostly review studies that retrieve the first-term studies, it is seen that studies concentrating on the impacts of technological innovations on the tourism sector are also predominant in this group. These results claim that the studies are not scattered in terms of co-citation relationship, but have integrity. On the other hand, the small number of groups indicates that new research topics that can be cited for many years have not been determined in this field. Besides, it provides a brief overview of the tourism innovation literature from past to present. It is valuable for us to see which studies are more popular and whose results are continuously effective. It also shows us the theoretical foundations of this field. We may also notice which topics are dominant in the tourism innovation literature. This information is crucial in terms of indicating which articles should be examined first by new researchers interested in the field of tourism innovation and the utilized methodological approaches.

Moreover, the most important journals of the field are in the field of tourism. This result allows us to see the leading journals that accept publications in the field of tourism innovation. Therefore, it may guide the journal preferences of researchers conducting research studies in this field. Researchers who examine relevant publications in leading

journals can analyze sample articles for maintaining good publications. We may also see the correlated journal groups more clearly. Moreover, the results allow us to see journal groups other than hospitality leisure and tourism, which accept publications in the field of innovation in tourism.

Additionally, Anne-Mette Hjalager, Colin Michael Hall, and Jon Sundbo are the most co-cited and popular researchers in the field of tourism innovation. Many researchers have benefited from and continue to benefit from the knowledge pool provided by these researchers. Besides, this result indicates which authors are the most productive, showing young researchers the footsteps of top researchers to follow. It also helps researchers who wish to engage in networking by allowing us to see the collaboration among authors.

Lastly, this study also indicates the trend of the field over the years, based on the frequent use of keywords. Therefore, it guides researchers regarding which issues would be essential in the future. In this study, it is seen that especially open innovation, sharing economy, sustainability, health, and technology issues have gained importance in recent years. Thus, future research may need to focus on research questions, such as (1) how to involve external stakeholders for open innovation in the tourism industry? (2) how does disruptive innovation develop for sharing economy of the tourism industry? (3) how can sustainable growth and competitiveness of tourism businesses through innovations be achieved? and (4) how does the fourth industrial evolution, associated with technological innovations in artificial intelligence, robotics, and automation, impact tourism innovation?

In conclusion, the findings of the bibliometric analysis respond to RQ1 which aims to identify the change of tourism innovation studies according to time and region. Figures 2 and 3 suggest that the researchers have started to pay attention to the tourism innovation research especially after 2008. Furthermore, Spain, Denmark, England and USA are the countries leading the research in this field.

The next research question inquired into the most productive articles, journals, and authors. This research question is addressed by using direct citations. According to Table 2, the articles titled "Airbnb: disruptive innovation and the rise of an informal tourism accommodation sector" [9], "A review of innovation research in tourism" [6], and "Networks, clusters and innovation in tourism: A UK experience" [40] (Novelli et al., 2006) are the most effective articles. In addition, Tables 3 and 4 shows Tourism Management and Anne-Mette Hjalager are the most cited journals and authors respectively.

Our third research question sought to illuminate the common citation and cluster structures. For this research question, we conducted a co-citation analysis. The references co-citation map in Figure 4 shows 48 documents with at least 20 out of 19,414 citations identified. The references constitute three clusters, in red, green, and blue, according to their relationship frequency. Hjalager's work entitled "A review of innovation research in tourism", ranks first. The work of the same author, entitled "Repairing innovation defectiveness in tourism", ranks second. In addition, according to the co-cited journal network (Figure 5), 163 co-cited journals form three clusters. Tourism Management, Annals of Tourism Research and International Journal of Hospitality Management are the top three journals in terms of the number of co-citations. In addition to this Figure 6 demonstrates the co-citation of cited authors. Accordingly, 119 authors form four clusters. Anne-Mette Hjalager, Colin Michael Hall, and Jon Sundbo are the leading authors in terms of co-citations.

Addressing (RQ4), an attempt to explore the cooperation network of author, organization, and country, Angela Martinez-Perez, Dioni Elche, and Pedro M. Garcia-Villaverde collaborate with each other. Besides, You-Shyen Horng and Chih-Hsing Liu are also co-authors (Figure 7). Furthermore, the University of Surrey has collaborated with the University of Alicante and the University of Southern Denmark (Figure 8). In addition to these, Figure 9 illustrates the country's cooperation network. Accordingly, countries constitute five clusters; in the first cluster, Denmark, Poland, Norway, and Sweden cooperate. In the second cluster Italy, the USA, and Turkey cooperate. In the third cluster, there is the closest

cooperation network between China and Taiwan. In the fourth cluster, India and Greece cooperate, and in the last cluster, Australia and Malaysia cooperate.

For the final research question, we employed a keyword co-occurrence analysis, or co-word analysis, to identify topical trends in the tourism innovation knowledge base. The most commonly co-occurring keywords in the review database were 'service innovation' (23 cases), 'hospitality' (20 cases), 'innovativeness' (19 cases), 'hotel' (17 cases), 'rural tourism' (14 cases), 'tourism innovation' (13 cases), 'social capital' (12 cases), 'hotel industry' (9 cases), and 'sustainability' (9 cases). Moreover, temporal overlay on a keyword co-word occurrence map shows the topics in which researchers have been interested recently. These topics consist of sharing economy, open innovation, COVID-19, sustainability, network, technology, co-creation, and absorptive capacity.

Theoretical implications

The theoretical contribution of this study is its presentation of a bibliometric outlook of the tourism innovation literature. This study demonstrates the most effective papers, researchers, and research topics that help to enhance knowledge in the field of tourism innovation. Thus, it provides a solid bibliometric basis for further research on innovation in tourism. In addition, this study helps researchers to keep track of tourism innovation literature. It filters the important works by estimating their impact and discovering the underlying structure of the tourism innovation field.

This work helps researchers in improving their knowledge of various bibliometric analysis routines. It also shows how this knowledge can be used to find specific research areas. Furthermore, the results provide a strong fundamental knowledge of tourism innovation and its prominent contributors to innovation literature. In this study, co-occurrence of keywords, co-citation, and collaboration bibliometric visualization techniques have been used to show the various structural characteristics of tourism innovation research such as conceptual and intellectual structure. This would likely help researchers interested in tourism innovation research after pandemic, to comprehend the topic from different dimensions with sustainability goals and technological environment [31,78–87].

Managerial implications

This study gives a clue to the managers about which areas they should innovate in order to gain competitive power. It is not clear how much sector practitioners follow these studies or what lessons they would learn from the results of these studies. Unfortunately, there is no database for this, but the existence of such a data pool would reveal the importance of these studies more clearly. Perceiving which subjects have been emphasized recently would enable tourism managers to concentrate on the problems discussed in these research areas and make their plans by taking into account the suggestions in these research studies. Furthermore, the study results present the most productive researchers and institutions. These findings help policymakers interested in tourism innovation to consult and collaborate with these scholars to generate, plan, and manage the projects in the tourism innovation field.

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