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# Technology in Hospitality, Leisure, Sport and Tourism Research: A Bibliometric Mapping

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ABSTRACT

Technology has profoundly influenced the tourism industry, and numerous studies have examined how the digitalization process has shaped various sectors and activities within tourism. A comprehensive analysis of these studies is essential to reveal the current state and emerging trends in literature. In this context, bibliometric analysis method, which is a performance analysis and science mapping method, was used. Articles in the fields of "hospitality, leisure, sports and tourism" in the Web of Science (WoS) database were scanned using technology-related keywords and 5103 articles published between 1995 and 2024 were included in the research. The selected articles were analyzed using the VOSviewer software through bibliometric methods, focusing on countries, institutions, journals, prominent authors, keywords, co-occurrence, clustering, and co-citation analyses. Based on the findings, four main research clusters were identified. Among these, social media emerged as the most frequently studied and highly cited themes, while areas such as virtual reality (VR), augmented reality (AR), and human-robot interaction have gained prominence in recent years. In addition, the temporal distribution of related studies was examined, and periodical research trends were discussed. Finally, recommendations for future studies were also provided.

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# Ağırlama, Boş Zaman, Spor ve Turizm Alanındaki Araştırmalarda Teknoloji: Bir Bibliyometrik Haritalama

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MAKALE BİLGİSİ

Literatür Taraması

**Anahtar Kelimeler:**
Teknoloji,
Turizm Araştırmaları,
Araştırma Eğilimleri,
Bibliyometrik Analiz,
Web Of Science

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ÖZ

Teknoloji, turizm endüstrisini derinlemesine etkilemiş ve birçok çalışmada dijitalleşme sürecinin turizmin çeşitli sektör ve faaliyetlerini nasıl şekillendirdiği incelenmiştir. Literatürdeki mevcut durumu ve eğilimleri ortaya koymak adına bu çalışmaların kapsamlı bir şekilde analiz edilmesi önem taşımaktadır. Bu bağlamda, performans analizi ve bilim haritalama yöntemi olan bibliyometrik analiz yöntemi kullanılmıştır. Web of Science (WoS) veri tabanındaki "ağırlama, boş zaman, spor ve turizm" alanlarındaki makaleler teknoloji ile ilgili anahtar kelimeler kullanılarak taranmış olup 1995-2024 yılları arasında yayımlanan 5103 makale araştırmaya dahil edilmiştir. Seçilen makaleler bibliyometrik yöntemlerle ülkeler, kurumlar, dergiler, öne çıkan yazarlar, anahtar kelimeler, eş ortaya çıkma, kümeleme ve eş atıf analizleri dikkate alınarak VOSviewer yazılımı aracılığıyla analiz edilmiştir. Analiz bulgularına göre çalışmada dört küme ortaya çıkarılmıştır. Bu dört küme içerisinde en çok araştırılan ve atıf alan tema sosyal medya olurken, son yıllarda VR, AR ve insan-robot etkileşimi gibi alanlar öne çıkmaktadır. Bunun yanında, ilgili araştırmaların dönemsel dağılımı incelenmiş ve dönemlere göre araştırma eğilimleri tartışılmıştır. Ayrıca, gelecekteki çalışmalara yönelik öneriler de sunulmuştur.

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**Introduction**

Over the last 50 years, the use of technology has increased day by day. A digital transformation process has begun to which individuals and businesses need to adapt. The emergence of the internet in the late 1900s further accelerated the digitalization process in all areas (Chamoux, 2018). Innovative technologies are included in the strategies of many countries, multinational organizations, professional associations and businesses with purposes such as increasing efficiency, providing social welfare and creating value (Ebert and Duarte, 2018). Like all other industries, technology has had a profound impact on hospitality, leisure, sport and tourism industries by changing the structure, processes and applications of tourism businesses (Buhalis, 2020). Xiang and Fesenmaier (2017) mentioned that the leaders in the tourism industry started to notice that the internet allowed for easier and more effective communication with customers between the years of 1991 and 2000. Afterward, these leaders acknowledged that travel experiences may be sold through information technologies and began using information technologies for this purpose.

With this transformation process, concepts such as virtual reality, augmented reality, mobile technologies, the internet of things, big data, smart technologies, blockchain, artificial intelligence, social media, robots and cloud computing have become highly significant for the businesses operating in the industry (Dredge et. al., 2018; Xiang and Fesenmaier, 2017). Buhalis (2020) emphasized the inevitability that these concepts will cause the transformation of the industry by affecting the structure, processes and practices of the tourism industry. It was also stated that in the future, the fields of marketing, management, competitiveness and innovation, in which the entire service industry operates, will be affected destructively and undergo a transformation (Buhalis, 2020). Similarly, in certain studies conducted on different dates, it was stated that this transformation is inevitable for society and businesses, as well, including those in the tourism industry (Yuan, Tseng and Ho, 2019; Wang and Zhang, 2012). Consequently, hotel businesses started to modify these technological developments in order to provide their services in a fast, accurate, satisfying and low-cost manner (Dalgic and Birdir, 2020). In addition to hotels, many actors directly related to tourism, such as restaurants, museums and other cultural areas benefit from technological developments today (Buhalis et al., 2019; Tuncer, 2020; Urbančič, et al., 2020). In the last years, the number of studies on information technologies in the tourism industry has been increasing, when all these digital and technological transformations have occurred (Yuan, Tseng and Ho, 2019).

As a result of these developments, the studies on tourism and technology have also been impacted. The impact of technology on tourism, hospitality, sport and leisure has become a point of research interest. It is thought that bibliometric study will be beneficial in terms of revealing the current status of studies in the related field. It can be said that bibliometric analysis method presents a general view from a holistic perspective. This method provides to see distribution of research in a relevant field and show prominent topic trends by classifying them (Toklu et al., 2024; Zeren & Kaya, 2020). Technology, a subject which has a dynamic feature, should be followed by each scientific field closely. In this research, the bibliometric

method will give the opportunity to see current development of technology in the field of hospitality, leisure, sport, and tourism. Bibliometric studies in tourism, hospitality, sport, and leisure have typically concentrated on particular technologies such as mobile technologies (Chen, Law, Xu and Zhang, 2020; Dorcic, Komsic and Markovic, 2019), social media (Mehraliyev, Choi and Koseoglu, 2019; Nusair, Butt and Nikhashemi, 2019), artificial intelligence (Knani, Echchakoui and Ladhari, 2022). It can be said that the number of bibliometric studies examining the technologies in a holistic manner is quite limited (Yuan, Tseng and Ho, 2019). It is thought that an important gap in literature will be filled by this holistic examination of technologies (mobile technologies, smart technologies, artificial intelligence, virtual reality (VR), augmented reality (AR), internet of things, big data, blockchain, social media, robots, cloud computing, etc.) in the fields of tourism, hospitality, sport and leisure. It is also important to determine the tendencies exhibited by studies and the most emphasized technological concepts within this field. This holistic study aims to identify the authors and journals that published the most on technology, to determine the articles, authors and journals that received the highest number of citations via co-citation analysis. It also aspires to identify the most used keywords and present the distribution of the keyword clusters of articles by the year. By mapping the relevant studies, this research aims to provide a clear understanding of technology research in the fields of hospitality, leisure, sport, and tourism.

## 1. Literature Review

Starting from the 1960s, machines that operated in an almost similar manner from the Industrial Revolution in the 18th century to the third quarter of the 20th century started to be replaced by computers that gave life to machines. It can be said that a digital age together with full of technological developments was initiated with the emergence of computers. Afterward, computerization began to show its influence on economic activities, as well, and businesses integrated computers into their production processes (Chamoux, 2018). When the origin of the term "technology" is examined in detail, it can be concluded that it originates from the word "techno-" and after evolving to "technology", the term refers to "systematic treatment of an art, craft, or technique" (Online Etymology Dictionary, 2025). In a broader sense, technology can be defined as knowledge, equipment, and methods that are used in science and industry (Cambridge Dictionary, 2025). The dissemination of digital technologies causes a constant transformation in society and businesses, called digital transformation (Nähler & Gronauer, 2017). Digital transformation process stands out as a concept which has triggered a continual process of technological adaptation within organizations (Ebert & Duarte, 2018).

In the literature, it is observed that the process of adapting to technological developments took place in three phases. In the first transformation phase that took place between 1991 and 2000 with the dissemination of the internet, the leaders of the tourism industry started to notice that the internet allowed for easier and more effective communication with customers. Afterward, between 2000 and 2010, the said leaders acknowledged that travel experiences can be sold with the help of information technologies and started to use information technologies for this purpose. With the emergence of the concept of Web 2.0 after 2010, which enabled content creation, particularly by users, a transformation that the tourism industry

was required to adapt to occurred (Xiang & Fesenmaier, 2017). In today's world, such technologies as mobile and smart devices, internet of things, social media, autonomous devices, robots, virtual and augmented reality are commonly used by organizations to support their operations in the tourism industry (Buhalis, 2020). In this context, tourism, hospitality, sport and leisure industries must also adapt to technological developments in parallel with these processes of digitalization and digital transformation.

The concepts of tourism, hospitality, sport and leisure are very similar and closely related to each other. Tourism and sports are two forms of activity that are related to the field of recreation and whose development phases date back to the very beginning. While sport only has a perceptive role in the field of tourism, it is also a type of activity in which tourists function as active participants in various sports activities (water sports, tennis, golf, skiing, sports games, etc.) (Jaksic-Stojanovic et al., 2019). Tourists travel with needs such as hospitality and recreation. Hospitality is defined as a process in which travelers' needs such as accommodation, eating and entertainment are met while interacting with each other (Camargo, 2019). Hospitality needs of travelers are fulfilled through the provision of various services from institutions such as housing and catering establishments. On the other hand, leisure and sport activities are two concepts that are included in the definition of tourism types such as sports, urban and mountain tourism (UNWTO, 2019). These activities are the ones that travelers frequently demand during their spare time in the places they visit. In addition to this, it is observed that both athletes and viewers have become mobile as a result of the increase in the popularity of mega sports events such as the Olympic Games. Furthermore, countries support transnational passage mobility and place importance on sports activities in terms of both the economic contribution they provide and international relations (Gammon & Robinson, 2003). Additionally, as stated by Hinch & Higham (2001), sport is a significant activity within tourism and tourism is a fundamental aspect of sports. Therefore, it is not possible to regard sport independently of the fields of tourism, hospitality and leisure. On the Web of Science database, these concepts are grouped together within the same category. For these reasons, in the present study, the concepts of tourism, hospitality, sport and leisure were discussed in conjunction.

## 2. Methodology

This study aims to conduct a bibliometric analysis of past research on technology in the fields of hospitality, leisure, sport, and tourism, identifying emerging trends and key concepts within these domains. The scientific mapping method allows the inclusion of literature overlooked in manual review studies and the discovery of a systematic literature network (Su and Lee, 2010). Bibliometric analysis allows for broader and more diverse topic coverage than traditional literature reviews. It can also facilitate revisions and reveal complex networks (Li et al., 2017). The efficiency of scientific publications was measured based on text-based data. Various methods have been developed to measure the flow of information and efficiency by country, discipline and author (Kurtz and Bollen, 2010). In this context, the scientific mapping method was used with the VOS Viewer program to analyse co-citation networks highlighting the intellectual foundations and key insights of various articles in the literature, as well as emerging trends and scientific advancements that can guide future studies (Chen, 2017;

Fang et al., 2018).

On the other hand, it has been shown that co-citation analysis is useful because it defines the intellectual structure of different disciplines from an objective and empirical perspective (Casillas and Acedo, 2007). On this basis, it is known that studies in the tourism field are also bibliometrically analysed. The fields examined using the bibliometric analysis method include food and gastronomy (Okumus et al., 2018), wine tourism (Sánchez et al., 2017), ecotourism (Shasha et al., 2020; Khanra et al., 2021), psychological studies in tourism (Barrios et al., 2008), sustainable tourism (Della Corte et al., 2019; Moyle et al., 2020), smart tourism destinations (Bastidas-Manzano et al., 2021), research on restaurants (Rodríguez-López et al., 2020), community-based tourism (Graciano and Holanda, 2020), geotourism (Herrera-Franco et al., 2020) and agrotourism (Rauniyar et al., 2021).

Publication metadata and citations are primary sources for bibliometric databases (Pranckute, 2021). Reviewing comprehensive sources and databases makes it easier to identify deficiencies in the relevant fields. This study used the WoS database of high-quality publications. It has been in use for 115 years and has almost 1.9 billion citations (Clarivate, 2023). WoS is one of the world's leading scientific publication and citation search platforms. It is a database of the most prestigious and well-known publications and is widely used for conducting bibliometric studies (Sun and Yuan, 2020).

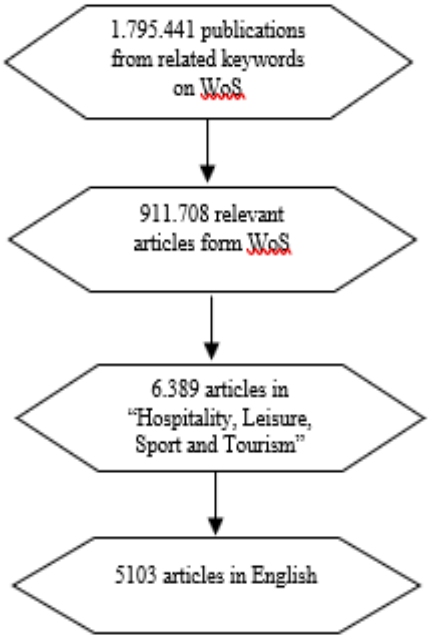


**Figure 1. The research criteria of this study**

The present study examined the articles, authors, journals and keywords that stood out in the studies of technology in the mentioned fields and were central to the joint network, as well as the most studied topics, trends, fields of study and current concepts in the field, and analyzed the nature of their distribution over the years. In this direction, the keywords "digitalization", "digital technology", "virtual reality",

"augmented reality", "mobile technology", "internet of things", "big data", "smart technology", "smart device", "blockchain", "artificial intelligence", "social media", "cloud computing", "robotic" and "robot" were searched on the WoS database. In this context, the publications between 1995 and 2024 were included in the evaluation. The information obtained from WOS in the research was accessed in January 2025.

The following criteria were established to carry out the present study. Firstly, articles in the relevant fields were included in the study and the publication language was set to English. After selecting these criteria, 5.103 articles were accessed. Figure 1 shows the selection criteria for the publications included in the study.

**3. Results**

Figure 2 shows that the 5103 articles in the WoS database were published between 1995 and 2024. The period with the highest number of publications covers the period from 2011 to the present. It can be observed that the number of studies on technology has grown, particularly with the rise of internet usage and the expansion of social media platforms. It would be reasonable to suggest that the data for 2025 is expected to show an increase compared to the previous year.

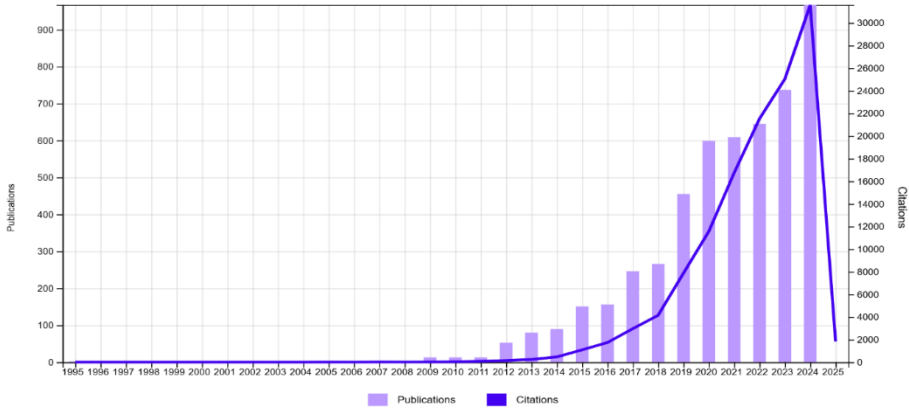


**Figure 2. Publications and citations by years**

Table 1 shows the top 10 journals and countries meeting the search criteria, which produced the highest number of publications on the subject. Based on data from 1995 to 2024, International Journal of Contemporary Hospitality Management is the journal with the highest number of publications on technology (n=281). Additionally, when the top 10 countries in terms of the number of publications on technology are examined based on the total number of citations, it is observed that the United States (n=1391) is in the first place, followed by the People's Republic of China (n=1141) and England (n=584).

**Table 1.** Top ten journals by publications and top ten countries by citations

| Journal Name | Number of retrieved papers from WoS | Country | Total Citations |
|---|---|---|---|
| International Journal of Contemporary Hospitality Management | 281 | USA | 1391 |
| Current Issues in Tourism | 265 | China | 1141 |
| International Journal of Hospitality Management | 253 | England | 584 |
| Tourism Management | 242 | Australia | 481 |
| Journal of Hospitality and Tourism Technology | 180 | Spain | 351 |
| Journal of Travel Research | 147 | South Korea | 262 |
| Communication Sport | 129 | India | 183 |
| Journal of Hospitality and Tourism Management | 115 | Canada | 182 |
| Journal of Destination Marketing Management | 111 | Italy | 175 |
| Tourism Management Perspectives | 104 | Taiwan | 151 |

### 3.1 The Co-citation Analysis

A co-citation analysis is defined as the frequency of two articles being co-cited (Small, 1973). In this context, Table 2 presents the co-citation network analysis data. The articles with the highest number of citations include Xiang & Gretzel (2010) (n=1,599), Leung et al. (2013) (n=826), Guttentag (2010) (n=763), Liu and Park (2015) (n=665), Kim et al. (2020) (n=630), Munar & Jacobsen (2014) (n=624) and Tussyadiah et al. (2018) (n=581) respectively. While Xiang and Gretzel (2010) investigated the role of social media in obtaining online travel information, Leung, Law, Van Hoof and Buhalis (2013) conducted a literature review of the studies conducted on social media use in the tourism and hospitality industries. The publication by Xiang and Gretzel (2010), ranking first in terms of both citation count and total link strength, indicates that it holds significant importance and influence in the relevant fields, occupying a central position within the network.

**Table 2**. Top Ten Journal Papers

| Authors | Title | Year | Journal | Tot. Cit. | Tot. Link. Stren. |
|---|---|---|---|---|---|
| **Xiang, Z., & Gretzel, U.** | Role of social media in online travel information search. | 2010 | Tourism Management | 1599 | 188 |
| **Leung, D., Law, R., Van Hoof, H., & Buhalis, D.** | Social media in tourism and hospitality: A literature review | 2013 | Journal of Travel & Tourism Marketing | 826 | 145 |
| **Guttentag, D. A.** | Virtual reality: Applications and implications for tourism | 2010 | *Tourism Management* | 763 | 97 |
| **Liu, Z.W., & Park, S.** | What makes a useful online review? Implication for travel product websites | 2015 | *Tourism Management* | 665 | 23 |

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| **Kim, M. J., Lee, C. K., & Jung, T.** | Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. | 2020 | *Journal of Travel Research* | 630 | 80 |
| **Munar, A. M., & Jacobsen, J. K. S.** | Motivations for sharing tourism experiences through social media | 2014 | Tourism Management | 624 | 86 |
| **Tussyadiah, I. P., Wang, D., Jung, T. H., & Tom Dieck, M. C.** | Virtual reality, presence, and attitude change: Empirical evidence from tourism. | 2018 | *Tourism Management* | 581 | 102 |
| **Xiang, Z., Schwartz, Z., Gerdes Jr, J. H., & Uysal, M.** | What can big data and text analytics tell us about hotel guest experience and satisfaction? | 2015 | *International Journal of Hospitality Management* | 564 | 60 |
| **Hays, S., Page, S. J., & Buhalis, D.** | Social media as a destination marketing tool: its use by national tourism organizations. | 2013 | *Current issues in Tourism* | 507 | 86 |
| **Ayeh, J. K., Au, N., & Law, R.** | "Do We Believe in TripAdvisor?" Examining Credibility Perceptions and Online Travelers' Attitude toward Using User-Generated Content | 2013 | *Journal of Travel Research* | 497 | 43 |

Figure 3 presents the visual network map of the co-citation analysis. According to the figure, highly cited publications such as Xiang & Gretzel (2010), Leung et al. (2013), Tussyadiah (2018), and Guttentag (2010) were frequently cited around the 2010s, as indicated by the purple tones. These publications have received over 500 citations, demonstrating their significance and influence in the relevant literature, as well as their widespread recognition. On the other hand, some publications, such as those by Geurin-Eagleman et al. (2016), are observed to have very distant connections, indicating that they do not hold a central position within the network.

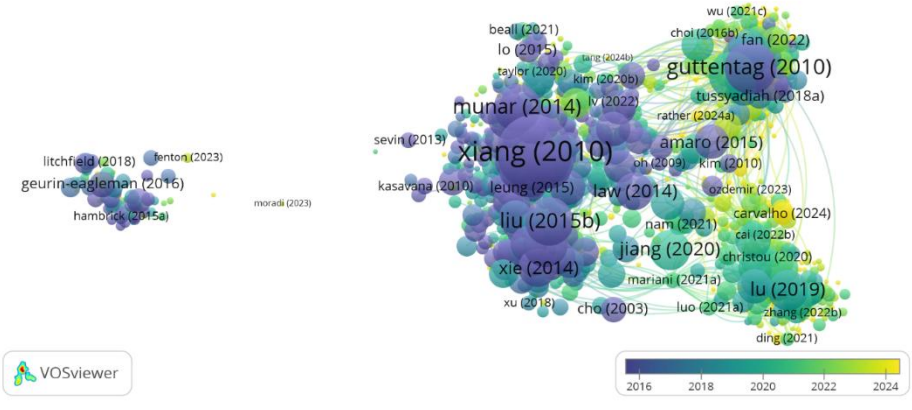


**Figure 3.** Publication co-citation network

### 3.2. Co-Authorship Analysis

The author co-citation network analysis shows the frequency with which an author's study is cited alongside another author in citation references, along with a visual representation (Jeong et al., 2014). Accordingly, Figure 4 shows the author co-citation network created using the scientific mapping method.

Table 3 presents the top authors ranked by the highest number of citations along with their total strength. Based on this, it is realized that the top five most cited authors are Rob Law (n=4478), Dimitrios Buhalis (n=4430), Zheng Xiang, (n=3110) and Ulrike Gretzel (n=2606) while the co-cited authors with the highest total link strength are Rob Law (n=128), Lina Zhong (n=40) and Dimitrios Buhalis (n=39). According to both the number of co-citations and total link strength, as well as the number of publications Rob Law is the author with the highest number of connections in the network. However, the fact that some authors (e.g., Lina Zhong and Chih-Hsing Liu) do not rank among the top 10 in terms of the number of publications but have high total link strength indicates the significant impact of their work in the relevant fields.

**Table 3.** Top ten most cited authors

| No | Author | Num. of Pub. | h-ind. | Tot. Cit. | Author | Num. of Pub. | h-ind. | Tot. Link Stren. |
|---|---|---|---|---|---|---|---|---|
| **1** | Rob Law | 79 | 130 | 4478 | Rob Law | 79 | 130 | 128 |
| **2** | Dimitrios Buhalis | 37 | 122 | 4430 | Lina Zhong | 18 | 22 | 40 |
| **3** | Zheng Xiang | 14 | 6 | 3110 | Dimitrios Buhalis | 37 | 122 | 39 |
| **4** | Ulrike Gretzel | 29 | 90 | 2606 | Chih-Hsing Liu | 15 | 53 | 38 |
| **5** | M. Claudia Tom Dieck | 20 | 41 | 2262 | Chris Zhu | 16 | 28 | 33 |
| **6** | Timothy Jung | 12 | 52 | 1659 | Lavrence Hoc Nanng Fong | 18 | 29 | 32 |
| **7** | Iis P. Tussyadiah | 11 | 55 | 1485 | Michael L. Naraine | 18 | 26 | 32 |
| **8** | Sangwon Park | 19 | 3 | 301 | Sheng-Fang Chou | 9 | 5 | 31 |
| **9** | Dogan Gursoy | 20 | 102 | 295 | Jeou-Shyan Horng | 9 | 44 | 31 |
| **10** | Dan Wang | 9 | 42 | 286 | Li Gang | 9 | 97 | 30 |

Figure 4 presents an analysis of authors with at least three publications and more than 100 citations. It includes data on the number of publications, total citation counts, and total link strength calculated by VOSviewer. According to Figure 4, the majority of publications by Rob Law and Dimitrios Buhalis are from the 2020s (green tones), while the majority of publications by Zheng Xiang are from 2018-2019 (purple tones). Based on total citation counts and total link strength, it can be observed that the top two authors have closely connected networks, and other authors are primarily clustered around these two networks, suggesting that they collaborate closely.

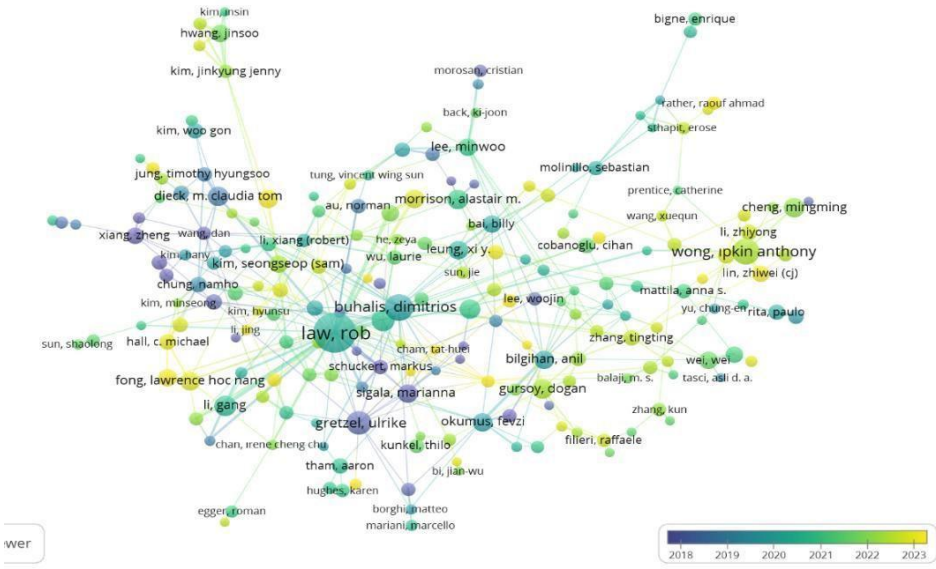


**Figure 4.** Author co-citation network

### 3.3. Co-Citation Cited Sources

The co-citation of articles refers to the occurrence of two or more articles appearing together in a tertiary bibliographic reference list, forming a co-citation relationship (Meng et al. 2020). The analysis of the cited sources from the examined articles in this study, presented in Figure 5. The top five journals that received the highest number of citations are Tourism Management (total citations: 17976), International Journal of Hospitality Management (total citations: 8304), Annals of Tourism Research (total citations: 8040), International Journal of Contemporary Hospitality Management (total citations: 7080), and Journal of Travel Research (total citations: 6132), respectively. The highest quantity of publications on technology were produced by these journals in the relevant fields.

**Table 4.** Top ten most cited journals

| No | Journal | Total Citations | Total Link Strength |
|---|---|---|---|
| **1** | Tourism Management | 17976 | 1034014 |
| **2** | International Journal of Hospitality Management | 8304 | 507018 |
| **3** | Annals of Tourism Research | 8040 | 480121 |
| **4** | International Journal of Contemporary Hospitality Management | 7080 | 430386 |
| **5** | Journal of Travel Research | 6132 | 380330 |
| **6** | Journal of Business Research | 4764 | 322542 |
| **7** | Current Issues in Tourism | 4259 | 251446 |
| **8** | Journal of Travel and Tourism Marketing | 4170 | 249679 |
| **9** | Computers in Human Behavior | 3906 | 236296 |
| **10** | Journal of Marketing | 2636 | 172035 |

Figure 5 presents the visual network map of Co-Citation Cited Sources. It is evident that Tourism Management, International Journal of Hospitality Management and

Current Issues in Tourism hold a central position within the network and are co-cited alongside publications from other journals.

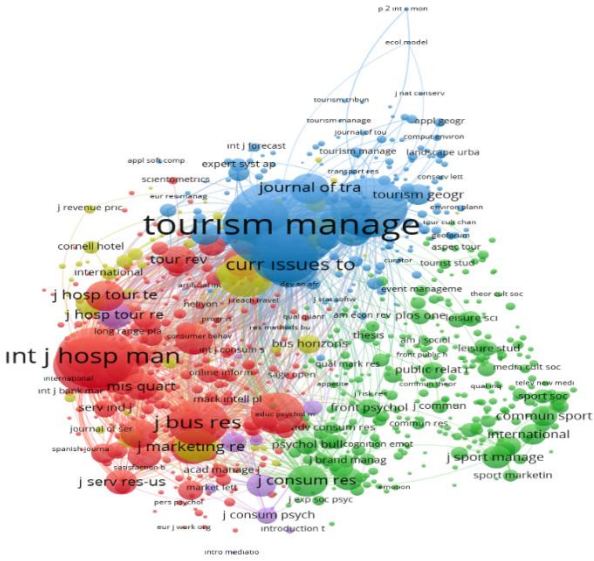


**Figure 5.** Journal co-citation network

### 3.4. Analysis of Co-Authors' Affiliations

The analysis of co-authors' affiliations reveals that the top five institutions with the highest total link strength are, in order, Hong Kong Polytechnic University (n=335), University of Macau (n=200), Kyung Hee University (n=190), University of Central Florida (n=143), and University of Johannesburg (n=143). Hong Kong Polytechnic University ranks first in terms of the number of publications, citations, and total link strength. This indicates that the institution is highly influential in the field, both in terms of its research output and the impact of its publications.

**Table 5.** Co-Authors' Affiliations Information

| No | Organization | Documents | Citations | Total Link Strength |
|---|---|---|---|---|
| **1** | Hong Kong Polytechnic University | 258 | 11274 | 335 |
| **2** | University of Macau | 105 | 1641 | 200 |
| **3** | Kyung Hee University | 88 | 3118 | 190 |
| **4** | University of Central Florida | 111 | 3814 | 143 |
| **5** | University of Johannesburg | 67 | 2489 | 143 |
| **6** | University of Canterbury | 28 | 820 | 121 |
| **7** | Linnaeus University | 22 | 384 | 118 |
| **8** | Temple University | 78 | 3660 | 117 |
| **9** | University of Oulu | 23 | 238 | 117 |
| **10** | City University of Macau | 62 | 1067 | 114 |

As shown in Figure 6, Hong Kong Polytechnic University has the highest number of citations (11,274) and has contributed to 258 publications. It would not be incorrect to state that this institution holds a highly influential and well-recognized position in the

academic field. Additionally, California State University is also present on the network map, positioned far from the center and forming a separate cluster. When examining the publication years of these institutions, it is evident that they predominantly received citations during the years 2019-2020.


**Figure 6.** Co-Authors' Affiliations Network

### 3.5. Analysis of Authors' Countries

Table 6 presents data on the number of publications, total citations, and total link strength by country. Based on total link strength, the top five countries are the USA (n=16,377), the People's Republic of China (n=15,216), England (n=9,684), Australia (n=5,823), and South Korea (n=3,842). The USA ranks first across all three categories—publication count, total citations, and total link strength—indicating its central role in the research network. This suggests that publications from the USA have a significant impact within the field, particularly in terms of co-citation relationships.

**Table 6.** Information on Authors' Countries

| Country | Documents | Citations | Total Link Strength |
|---|---|---|---|
| **USA** | 1389 | 42045 | 16377 |
| **People's Republic of China** | 1139 | 32604 | 15216 |
| **England** | 581 | 22073 | 9684 |
| **Australia** | 479 | 13431 | 5823 |
| **South Korea** | 261 | 6390 | 3842 |
| **Spain** | 351 | 8256 | 3756 |
| **India** | 181 | 3431 | 2590 |
| **Italy** | 175 | 5184 | 2551 |
| **Taiwan** | 150 | 3476 | 2372 |
| **Canada** | 182 | 4340 | 2005 |

Figure 7 focuses on the analysis of countries with more than 10 publications and over 100 citations. Based on the number of publications, total citations, and total link strength, the USA, England, and Spain appear to form central positions in the visual network map, with co-citations predominantly occurring from 2020 onwards (represented by purple tones). Additionally, it would not be incorrect to state that the People's Republic of China has established a central position in terms of co-citation

since 2022 (represented by light green tones). Furthermore, Türkiye demonstrates a moderate level of collaboration, with its publications beginning to receive citations from 2023 onwards (represented by yellow tones).

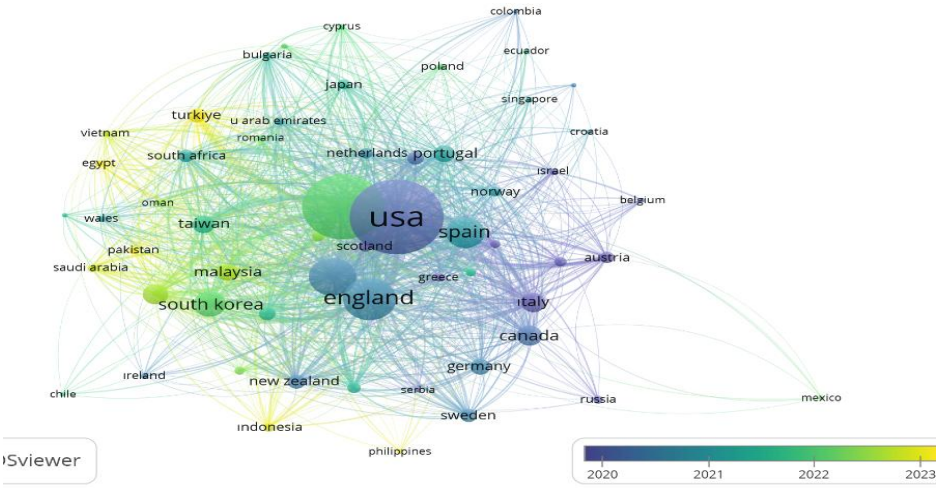


**Figure 7.** Authors' Countries Network

### 3.6. Co-Occurrence Author Keywords

The Co-Occurrence Author Keywords refers to the joint appearance of two keywords in the same article, and keywords related to study topics can be identified through the frequency and interval centrality of keywords (Zhang, 2019).

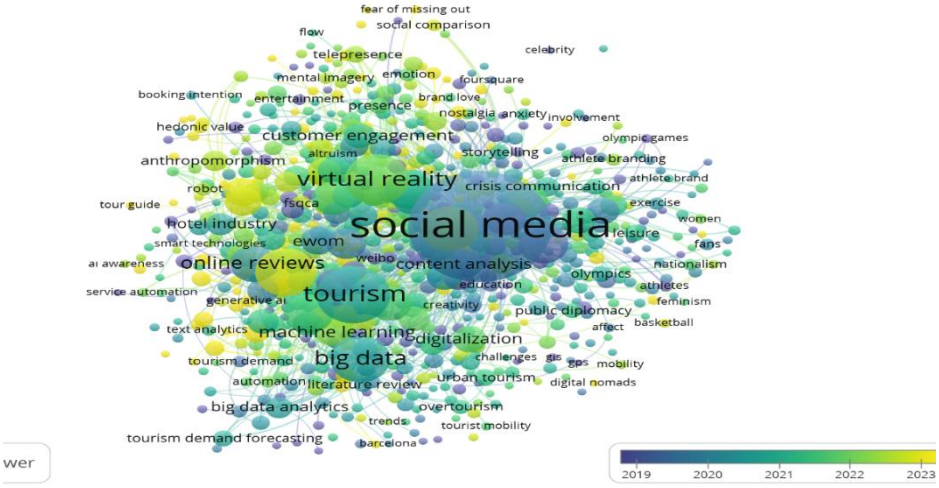


**Figure 8.** Keyword co-citation network

Figure 8 indicates that the terms social media, tourism, artificial intelligence, big data, and virtual reality are among the most frequently occurring and strongly connected keywords. The term social media was predominantly used around 2019 (represented by purple tones), while big data and tourism were frequently used between 2020 and

2021 (represented by dark green tones). Additionally, the term virtual reality was frequently used in 2022 (represented by light green tones). Therefore, it can be suggested that in future periods, virtual reality and augmented reality will be increasingly explored and discussed within the context of tourism.

Table 5 presents the top 10 most frequently used keywords in the Co-occurrence Author Keywords analysis. Based on this, the most frequently used keywords are social media (total citations: 994), tourism (total citations: 268), virtual reality (total citations: 208), and artificial intelligence (total citations: 182).

**Table 7.** Top Ten Keywords

| No | Keyword | Occurrences | Total Link Strength |
|---|---|---|---|
| **1** | social media | 994 | 2183 |
| **2** | tourism | 268 | 695 |
| **3** | virtual reality | 208 | 480 |
| **4** | artificial intelligence | 182 | 450 |
| **5** | covid-19 | 161 | 405 |
| **6** | hospitality | 122 | 377 |
| **7** | big data | 177 | 347 |
| **8** | twitter | 121 | 320 |
| **9** | destination image | 122 | 312 |
| **10** | online reviews | 109 | 311 |

### 3.7. Bibliographic Coupling Analysis

It has been proven that co-citation cluster analysis is an effective tool in revealing the intellectual structure of a specific field of study (Song et al., 2019). Bibliographic content analysis has been conducted, leading to the identification of four distinct clusters. To illustrate the bibliographic coupling network, Figure 9 presents a visual representation of the network structure.

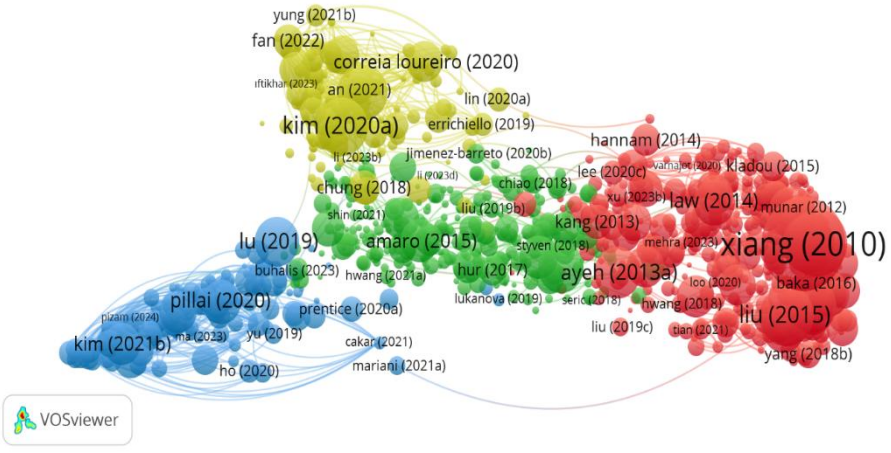


**Figure 9.** Network of bibliographic coupling

***Cluster 1:*** The first and largest cluster consists of 417 articles. As shown in Figure 9, this

cluster is represented in red tones, with the Xiang and Gretzel (2010) study occupying a central position in the network. This study examines how search engines influence travel planning by directing users to social media through predefined keyword searches for U.S. tourist destinations. Accordingly, social media has an accelerating effect on tourism, but it has also revealed the shortcomings of traditional methods. This study is in a central position within the cluster and has been cited by other studies. Another study in a central position has concluded that online comments are effective (Liu and Park, 2015). Therefore, it is possible to say that social media is an important and effective tool for tourism marketers. Another influential study in the network is on how reviews created by user-generated content (UGC) are evaluated by travelers (Ayeh et al., 2013). Therefore, the high link strength and citation data of the studies in this cluster explain the significant and strong impact of social media and user-generated content (UGC) on tourism.

***Cluster 2:*** The second cluster consists of 238 articles and is represented in green tones in the visual. The study conducted by Amaro & Duarte (2015) is the most prominent work within this cluster, with 338 citations and a total of 1,684 links. The research concluded that online travel purchase intentions are influenced by perceived risk. Another influential study within the second cluster investigated Generation Y's information-seeking and sharing habits on social networking sites (SNS) (Bilgihan et al., 2014). The study has garnered 218 citations and holds a linkage strength of 1,426 within the cluster. Drawing on its findings, the research analyzes Generation Y's social-media usage patterns. Consequently, it provides valuable insights into consumer behavior models in social-media marketing. A highly impactful study conducted by Jung et al. (2015) has 316 citations and 916 links and investigated augmented reality applications and user satisfaction. Overall, this cluster stands out for its focus on how consumers behave in digital contexts—spanning online travel purchases, social-media interaction, and the adoption of augmented-reality tools. The studies form a tightly interconnected citation web, marked by robust co-citation links and a high aggregate link strength within the academic network.

***Cluster 3:*** The third cluster contains 161 articles and is visualized in shades of blue. Works with the strongest citation and linkage metrics here typically examine AI-powered chatbots in the tourism industry and their impacts. A standout example is the paper by Pillai & Sivathanu (2020), which has received 356 citations and a total link strength of 2,136. Focusing on India's tourism sector, the study found that AI chatbots were appreciated for their ease of use, perceived usefulness, and trustworthiness, yet they also diminished travelers' reliance on human intermediaries. Another significant study within the cluster is by Lu et al. (2019), which has received 457 citations and holds a total link strength of 1,784. The research focuses on developing a 36-item scale to examine interactions with service robots through concepts such as efficacy, motivation, and social influence. Similarly, a study by Kim et al. (2021), with 317 citations and a total link strength of 1,480, explores consumer attitudes toward hotels employing robot staff during the Covid-19 pandemic. The findings indicate that, due to health concerns, consumers showed a preference for hotels with robotic employees during the pandemic. In summary, this cluster explores the impact of AI-powered chatbots and robots on the tourism industry, with a particular focus on how these technologies influence consumer preferences and decision-making.

***Cluster 4:*** The fourth cluster includes 139 articles and is represented in yellow tones

within the network. This cluster primarily investigates the impact of technological advancements—particularly virtual reality (VR) and augmented reality (AR)—on the tourism industry. One of the central studies in the co-citation network is the work by Kim et al. (2020), which has received 630 citations and has a total link strength of 2,150. This study applies the Stimulus-Organism-Response (S-O-R) theory to VR tourism, examining how unique experiences influence cognitive and emotional responses. The findings indicate that authentic experiences enhance the effectiveness of VR, which in turn positively impacts the intention to visit a destination. Another study with a strong linkage strength in this cluster is by Tussyadiah et al. (2018). With 581 citations and a total link strength of 1,265, the research found that experiencing a destination through virtual reality (VR) increases individuals' preference for that destination and enhances their intention to visit it in real life. Additionally, another key study in this cluster was conducted by Loureiro et al. (2020), which has received 308 citations and a total link strength of 918. This research examined the impacts of VR and AR technologies on the tourism industry, offering an assessment of emerging trends and consumer preferences. Overall, this cluster highlights the growing influence of VR and AR technologies in tourism research, particularly emphasizing their effects on consumer behavior and destination choice.

**Discussion and Conclusion**

The digital transformation of an industry is defined as the use of new technologies to fulfill customer demands (Pindzo and Barjaktarović, 2018). Rapid developments in information and communication technologies have facilitated the sharing and receiving of data by businesses and tourists (Leung, 2018). Today, new technologies play a significant role in managing and marketing tourism organizations and destinations. Moreover, it can be argued that digital tools influence tourist consumer behavior by shaping the decision-making journey from product search to actual consumption (Minghetti and Buhalis, 2010). Considering the increment of technology usage in the field, examining research related to technology by a bibliometric study plays a critical role in providing a holistic view.

In this context, several key implications can be derived from the findings of the studies included in this research. Although the studies examined have been published since 1995, the number of academic articles on the subject has significantly increased, particularly since 2011. In particular, the number of articles published between 2011 and 2024 represents more than 95% of all articles. The article by Xiang and Gretzel (2010), which explores the presence of social media in search engine results for travel-related searches, has received the highest number of citations and the greatest total link strength. This study holds a central position in citations, as it is one of the most notable and foundational works in the field, marking the starting point for subsequent research. In addition, the topic of social media was the most researched concept in terms of most cited keywords and most cited articles. As stated by Gupta (2019) and Varkaris and Neuhofer (2017), social media is effective in tourists' hotel decision making and is used as an important source of information. Furthermore, another study that conducted content analysis of articles found that consumer-centered studies generally focused on the use and influence of social media in travelers' planning process (Leung et. al., 2013). Therefore, social media is one of the resources that tourists benefit from in deciding their consumption preferences. It can be said that social media research has gained great momentum within a research period of 10 years, and the

studies are predicted to increase in this field.

In the co-authorship analysis, Rob Law emerges as the most prominent author. According to the number of co-citations, total link strength, and publication count, Rob Law has the highest number of connections in the network. Additionally, Dimitrios Buhalis is also among the influential authors in terms of citation count and total link strength. However, some authors, such as Lina Zhong and Chih-Hsing Liu, do not rank among the top 10 in terms of publication count but still have a high total link strength, indicating the significant impact of their work in the field. A high total link strength despite having fewer publications suggests that their studies are high-quality, widely cited, and frequently read. In terms of citation sources (journals), Tourism Management (total citations: 17,976), International Journal of Hospitality Management (total citations: 8,304), and Annals of Tourism Research (total citations: 8,040) stand out as key sources in terms of both citation count and total link strength. Regarding the analysis of co-authors' affiliations, institutions such as Hong Kong Polytechnic University (n=335), University of Macau (n=200), Kyung Hee University (n=190), University of Central Florida (n=143), and University of Johannesburg (n=143) are identified as highly central institutions, frequently cited together due to the collaborative work of researchers affiliated with them. In terms of co-citations by country, the most influential countries in this field include the USA (n=16,377), the People's Republic of China (n=15,216), England (n=9,684), Australia (n=5,823), and South Korea (n=3,842). The findings also suggest that institutions from these countries play a significant role in the network, contributing to high co-citation and total link strength.

Another study examined the impact of social media on the tourism industry and consumer behavior, highlighting the significant influence of online visibility and user-generated content (such as photos, videos, and reviews) on the sector (Leung et al., 2013). The study also noted the growing volume of research focusing on the role of VR and AR technologies in tourism. These technologies are increasingly recognized for the opportunities, benefits, and risks they present to the industry. As emphasized by Loureiro et al. (2020), VR and AR contribute to enhancing, promoting, educating, designing, managing, and planning tourism experiences.

One of the key findings of the study is that the research in the field can be categorized into four distinct clusters. The largest cluster, which also has the highest number of citations and total link strength, is centered around the co-citation network in which the most influential and central article is the study by Xiang and Gretzel (2010). This suggests that their work is a widely cited and foundational reference for researchers in this area. The second cluster focuses on the impact of emerging technologies on the tourism industry. The third cluster includes studies that explore how these technologies influence consumer perceptions and consumption behaviors. The fourth and final cluster brings together research that examines the effects of recent technological developments on the tourism sector, forming a coherent theme within itself. Therefore, through this bibliographic mapping analysis, the aim is to identify influential studies, emerging research areas, and key topics, while also offering insights into how technological advancements are shaping the tourism industry and its future potential.

In this study, the literature review was conducted through a bibliometric citation

network analysis, with the aim of identifying potential research topics in the field. Upon examining the literature, it is evident that similar studies have also contributed significantly to the domain. For instance, the study by Correia Loureiro et al. (2020) explored the role of VR and AR in the tourism context and identified four main themes: sensory stimulation, extended virtual experiences, enhanced well-being, and AI integration. These findings are consistent with the keyword analysis in this study, which revealed that VR and AR are among the top ten most frequently examined topics. Another study analyzed 61 articles on digital transformation and tourism published in the Scopus database between 2017 and 2022. The results indicated that technologies such as IoT, AI, VR, and AR have improved visitor experiences and increased customer satisfaction within the tourism industry. Moreover, Madzik et al. (2023) conducted an analysis of 3,683 articles indexed in Scopus and Web of Science related to digital transformation in the tourism industry. Their clustering analysis revealed that social media is one of the most influential and dominant themes, demonstrating its strong impact within this field. Similarly, Roziqin et al. (2023) identified the five main research themes in this domain as ICT for tourism, digital tourism and tourist experience, tourism digital marketing, tourism applications, and innovations. These studies collectively emphasize the growing influence of digital technologies in tourism research, highlighting key emerging themes and their potential future research directions.

Therefore, it is important to investigate how technologies such as VR and AR can be used and perceived by tourists, and what their potential reservations may be. In addition to these, how the tourism industry will transform in the light of the said developments or how the related stakeholders will be affected and position themselves are notable subjects, as well. In addition, experiencing a touristic product, service or destination in a virtual environment before actually offering it can facilitate the foreshadowing of service quality and contribute to marketing in tourism. It is also thought that the identification of current tendencies and study subjects will be beneficial in terms of guiding the researchers who wish to study this field. In addition to all these, in theoretical terms, the present study provides a holistic view in terms of mapping the digital transformation process in the fields of "hospitality, leisure, sport and tourism" while in practical terms, it includes information that can guide practitioners operating in the related industry. It is important to mention that the current research has some limitations such as the articles published in English language between 1995 and 2024 in the Web of Science database. Other databases or different time periods can be considered by researchers in future studies. The current research is expected to enlighten further research to understand the evolution of technology research in hospitality, leisure, sport and tourism.

**References**

Amaro, S., & Duarte, P. (2015). An integrative model of consumers' intentions to purchase travel online. *Tourism Management*, *46*, 64-79.

Ayeh, J. K., Au, N., & Law, R. (2013). "Do we believe in TripAdvisor?" Examining credibility perceptions and online travelers' attitude toward using user-generated content. *Journal of Travel Research*, *52*(4), 437-452.

Baniya, R., Dogru-Dastan, H., & Thapa, B. (2020). Visitors' experience at Angkor Wat, Cambodia: Evidence from sentiment and topic analysis. *Journal of Heritage Tourism*, *16*(6), 632-645. https://doi.org/10.1080/1743873X.2020.1833892

Barrios, M., Borrego, A., Vilaginés, A., Ollé, C., & Somoza, M. (2008). A bibliometric study of psychological research on tourism. *Scientometrics*, *77*(3), 453-467. https://doi.org/10.1007/s11192-007-1952-0

Bastidas-Manzano, A. B., Sánchez-Fernández, J., & Casado-Aranda, L. A. (2021). The past, present, and future of smart tourism destinations: A bibliometric analysis. *Journal of Hospitality & Tourism Research*, *45*(3), 529-552. https://doi.org/10.1177/1096348020967062

Bazm, S., Kalantar, S. M., & Mirzaei, M. (2016). Bibliometric mapping and clustering analysis of Iranian papers on reproductive medicine in Scopus database (2010-2014). *International Journal of Reproductive BioMedicine*, *14*(6), 371–382. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4971550/pdf/ijrb-14-371.pdf

Bilgihan, A., Peng, C., & Kandampully, J. (2014). Generation Y's dining information seeking and sharing behavior on social networking sites: An exploratory study. *International Journal of Contemporary Hospitality Management*, *26*(3), 349-366.

Buhalis, D. (2020). Technology in tourism—From information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review*, *75*(1), 267-272. https://doi.org/10.1108/TR-06-2019-0258

Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S., & Hofacker, C. (2019). Technological disruptions in services: Lessons from tourism and hospitality. *Journal of Service Management*, *30*(4), 484-506. https://doi.org/10.1108/JOSM-12-2018-0398

Camargo, L. O. L. (2019). Hospitality, tourism and leisure. *Revista Brasileira de Pesquisa em Turismo*, *13*(3), 1-15. https://doi.org/10.7784/rbtur.v13i3.1749

Cambridge Dictionary. (2025). Technology. In *Cambridge Dictionary*. Retrieved April 9 from https://dictionary.cambridge.org/dictionary/english-turkish/technology

Casillas, J., & Acedo, F. (2007). Evolution of the intellectual structure of family business literature: A bibliometric study of FBR. *Family Business Review*, *20*(2), 141–162. https://doi.org/10.1111/j.1741-6248.2007.00092.x

Chamoux, J. P. (2018). Digital omnipresence: Its causes and consequences. In J. P. Chamoux, *The digital era 1: Big data stakes* (pp. 5-34). ISTE Ltd. https://doi.org/10.1002/9781119102687.ch1

Chen, C. (2017). Science mapping: A systematic review of the literature. *Journal of Data and Information Science*, *2*, 1–40. https://doi.org/10.1515/jdis-2017-0006

Chen, S., Law, R., Xu, S., & Zhang, M. (2020). Bibliometric and visualized analysis of mobile technology in tourism. *Sustainability*, *12*(19), 1-16. https://doi.org/10.3390/su12197975

Clarivate Analytics. (2023). *Web of science*. https://clarivate.com/webofsciencegroup/solutions/%20web-of-science/

Dalgic, A., & Birdir, K. (2020). Smart hotels and technological applications. In E. Çeltek (Ed.), *Handbook of research on smart technology applications in the tourism industry* (pp. 323-343). IGI Global. https://doi.org/10.4018/978-1-7998-1989-9.ch015

Della Corte, V., Del Gaudio, G., Sepe, F., & Sciarelli, F. (2019). Sustainable tourism in the open innovation realm: A bibliometric analysis. *Sustainability*, *11*(21), 6114. https://doi.org/10.3390/su11216114

Dorcic, J., Komsic, J., & Markovic, S. (2019). Mobile technologies and applications towards smart tourism – state of the art. *Tourism Review*, *74*, 82-103. https://doi.org/10.1108/TR-07-2017-0121

Dredge, D., Phi, G., Mahadevan, R., Meehan, E., & Popescu, E. S. (2018). *Digitalisation in tourism: In-depth analysis of challenges and opportunities*. Aalborg University. https://vbn.aau.dk/ws/files/296441087/REPORT_TourismDigitalisation_131118_REV_KB_EM_4_.pdf

Ebert, C., & Duarte, C. H. (2018). Digital transformation. *IEEE Software*, *35*, 16-21. https://doi.ieeecomputersociety.org/10.1109/MS.2018.2801537

Fang, Y., Yin, J., & Wu, B. (2018). Climate change and tourism: A scientometric analysis using CiteSpace. *Journal of Sustainable Tourism*, *26*(1), 108-126. https://doi.org/10.1080/09669582.2017.1329310

Gammon, S., & Robinson, T. (2003). Sport and tourism: A conceptual framework. *Journal of Sport & Tourism*, *8*(1), 21–26. https://doi.org/10.1080/14775080306236

Geurin-Eagleman, A. N., & Burch, L. M. (2016). Communicating via photographs: A gendered analysis of Olympic athletes' visual self-presentation on Instagram. *Sport Management Review*, *19*(2), 133-145.

Graciano, P. F., & Holanda, L. A. D. (2020). Bibliometric analysis of scientific literature on community-based tourism from 2013 to 2018. *Revista Brasileira de Pesquisa em Turismo*, *14*(1), 161-179. https://doi.org/10.7784/rbtur.v14i1.1736

Gupta, V. (2019). The influencing role of social media in the consumer's hotel decision-making process. *Worldwide Hospitality and Tourism Themes*. https://doi.org/10.1108/WHATT-04-2019-0019

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

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. https://doi.org/10.1080/13683500.2012.662215

Herrera-Franco, G., Montalván-Burbano, N., Carrión-Mero, P., Apolo-Masache, B., & Jaya-Montalvo, M. (2020). Research trends in geotourism: A bibliometric analysis using the Scopus database. *Geosciences*, *10*(10), 379. https://doi.org/10.3390/geosciences10100379

Hinch, T. D., & Higham, J. E. (2001). Sport tourism: A framework for research. *International Journal of Tourism Research*, *3*(1), 45-58. https://doi.org/10.1002/1522-1970(200101/02)3:1%3C45::AID-JTR243%3E3.0.CO;2-A

Jaksic-Stojanovic, A., Jankovic, M., & Seric, N. (2019). Montenegro as high-quality sports tourism destination-trends and perspectives. *Sport Mont*, *17*(1), 93-95. https://doi.org/10.26773/smj.190218

Jeong, Y. K., Song, M., & Ding, Y. (2014). Content-based author co-citation analysis. *Journal of Informetrics*, *8*(1), 197-211. https://doi.org/10.1016/j.joi.2013.12.001

Jung, T., Chung, N., & Leue, M. C. (2015). The determinants of recommendations to use augmented reality technologies: The case of a Korean theme park. *Tourism Management*, *49*, 75-86.

Khanra, S., Dhir, A., Kaur, P., & Mäntymäki, M. (2021). Bibliometric analysis and literature review of ecotourism: Toward sustainable development. *Tourism Management Perspectives*, *37*, 100777. https://doi.org/10.1016/j.tmp.2020.100777

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.

Knani, M., Echchakoui, S., & Ladhari, R. (2022). Artificial intelligence in tourism and hospitality: Bibliometric analysis and research agenda. *International Journal of Hospitality Management*, *107*, 103317. https://doi.org/10.1016/j.ijhm.2022.103317

Kumar, S., Kumar, V., Kumari Bhatt, I., Kumar, S., & Attri, K. (2024). Digital transformation in tourism sector: Trends and future perspectives from a bibliometric-content analysis. *Journal of Hospitality and Tourism Insights*, *7*(3), 1553-1576.

Kurtz, M. J., & Bollen, J. (2010). Usage bibliometrics. *Annual Review of Information Science and Technology*, *44*(1), 1-64. https://doi.org/10.1002/aris.2010.1440440108

Leung, D., Law, R., Van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel & Tourism Marketing*, *30*(1-2), 3-22. https://doi.org/10.1080/10548408.2013.750919

Leung, R. (2018). Smart hospitality: Taiwan hotel stakeholder perspectives. *Tourism Review*, *74*(1), 50-62. https://doi.org/10.1108/tr-09-2017-0149

Liu, Z., & Park, S. (2015). What makes a useful online review? Implication for travel product websites. *Tourism Management*, *47*, 140-151.

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. https://doi.org/10.1016/j.tourman.2019.104028

Lu, L., Cai, R., & Gursoy, D. (2019). Developing and validating a service robot integration willingness scale. *International Journal of Hospitality Management*, *80*, 36-51.

Madzík, P., Falát, L., Copuš, L., & Valeri, M. (2023). Digital transformation in tourism: Bibliometric literature review based on machine learning approach. *European Journal of Innovation Management*, *26*(7), 177-205.

Mehraliyev, F., Choi, Y., & Koseoglu, M. A. (2019). Social structure of social media research in tourism and hospitality. *Tourism Recreation Research*, *44*(4), 451-465. https://doi.org/10.1080/02508281.2019.1609229

Meng, L., Wen, K. H., Brewin, R., & Wu, Q. (2020). Knowledge atlas on the relationship between urban street space and residents' health—A bibliometric analysis based on VOSviewer and CiteSpace. *Sustainability*, *12*(6), 2384. https://doi.org/10.3390/su12062384

Minghetti, V., & Buhalis, D. (2010). Digital divide in tourism. *Journal of Travel Research*, *49*(3), 267–281. https://doi.org/10.1177/0047287509346843

Moyle, B., Moyle, C. L., Ruhanen, L., Weaver, D., & Hadinejad, A. (2020). Are we really progressing sustainable tourism research? A bibliometric analysis. *Journal of Sustainable Tourism*, *29*(1), 106-122. https://doi.org/10.1080/09669582.2020.1817048

Nähler, H., & Gronauer, B. (2017). TRIZ in the context of digitalisation and digital transformation. In *Proceedings of the MATRIZ TRIZfest-2017 International Conference* (pp. 475-482).

Nusair, K., Butt, I., & Nikhashemi, S. (2019). A bibliometric analysis of social media in hospitality and tourism research. *International Journal of Contemporary Hospitality Management*, *31*(7), 2691-2719. https://doi.org/10.1108/IJCHM-06-2018-0489

Okumus, B., Koseoglu, M. A., & Ma, F. (2018). Food and gastronomy research in tourism and hospitality: A bibliometric analysis. *International Journal of Hospitality Management*, *73*, 64-74. https://doi.org/10.1016/j.ijhm.2018.01.020

Online Etymology Dictionary. (2025). *Origin and history of technology*. In *Online Etymology Dictionary*. Retrieved April 9, 2025 from https://www.etymonline.com/word/technology

Pillai, R., & Sivathanu, B. (2020). Adoption of AI-based chatbots for hospitality and tourism. *International Journal of Contemporary Hospitality Management*, *32*(10), 3199-3226.

Pindžo, R., & Brjaktarović, L. (2018). Digital transformation of tourism. *Tourism International Scientific Conference Vrnjačka Banja - TISC*, *3*(1), 340-355. http://www.tisc.rs/proceedings/index.php/hitmc/article/view/19

Pranckutė, R. (2021). Web of Science (WoS) and Scopus: The titans of bibliographic information in today's academic world. *Publications*, *9*(1), 12. https://doi.org/10.1080/17430437.2020.1772233

Rauniyar, S., Awasthi, M. K., Kapoor, S., & Mishra, A. K. (2021). Agritourism: Structured literature review and bibliometric analysis. *Tourism Recreation Research*, *46*(1), 52-70. https://doi.org/10.1080/02508281.2020.1753913

Rodríguez-López, M. E., Alcántara-Pilar, J. M., Del Barrio-García, S., & Muñoz-Leiva, F. (2020). A review of restaurant research in the last two decades: A bibliometric analysis. *International Journal of Hospitality Management*, *87*, 102387. https://doi.org/10.1016/j.ijhm.2019.102387

Sánchez, A. D., Del Río, M. D. L. C., & García, J. Á. (2017). Bibliometric analysis of publications on wine tourism in the databases Scopus and WoS. *European Research on Management and Business Economics*, *23*(1), 8-15. https://doi.org/10.1016/j.iedeen.2016.02.001

Shasha, Z. T., Geng, Y., Sun, H. P., Musakwa, W., & Sun, L. (2020). Past, current, and future perspectives on eco-tourism: A bibliometric review between 2001 and 2018. *Environmental Science and Pollution Research*, *27*(19), 23514-23528. https://doi.org/10.1007/s11356-020-08584-9

Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for Information Science*, *24*(4), 265-269.

Song, J., Li, Y., Feng, Z., & Wang, H. (2019). Cluster analysis of the intellectual structure of PPP research. *Journal of Management in Engineering*, *35*(1), 04018053. https://doi.org/10.1061/(asce)me.1943-5479.0000664

Su, H. N., & Lee, P. C. (2010). Mapping knowledge structure by keyword co-occurrence: A first look at journal papers in Technology Foresight. *Scientometrics*, *85*, 65-79. https://doi.org/10.1007/s11192-010-0259-8

Sun, J., & Yuan, B.-Z. (2020). Mapping of the world rice research: A bibliometric analysis of top papers during 2008-2018. *Annals of Library and Information Studies*, *67*(1), 56-66. https://doi.org/10.56042/alis.v67i1.30297

Toklu, R., Gök, M., Güven, E., & Eren, T. (2024). Türkiye'de bulut bilişim üzerine yapılmış tezlerin bibliyometrik analizi. *Selçuk Turizm ve Bilişim Araştırmaları Dergisi*, (6), 37-55. https://dergipark.org.tr/tr/pub/stbad/issue/87990/1516769

Tuncer, İ. (2020). Customer experience in the restaurant industry: Use of smart technologies. In E. Çeltek (Ed.), *Handbook of research on smart technology applications in the tourism industry* (pp. 254-272). IGI Global. https://doi.org/10.4018/978-1-7998-1989-9.ch012

Tussyadiah, I. P., Wang, D., Jung, T. H., & Tom Dieck, M. C. (2018). Virtual reality, presence, and attitude change: Empirical evidence from tourism. *Tourism Management*, *66*, 140-154.

UNWTO (United Nations World Tourism Organization). (2019). *UNWTO tourism definitions*. UNWTO. https://doi.org/10.18111/9789284420858

Urbančič, J., Kuralt, V., Ratkajec, H., Straus, M., Vavroš, A., Mokorel, S., & Ilijaš, T. (2020). Expansion of technology utilization through tourism 4.0 in Slovenia. In E. Çeltek (Ed.), *Handbook of research on smart technology applications in the tourism industry* (pp. 229-253). IGI Global. https://doi.org/10.4018/978-1-7998-1989-9.ch011

Varkaris, E., & Neuhofer, B. (2017). The influence of social media on the consumers' hotel decision journey. *Journal of Hospitality and Tourism Technology*, *8*(1), 101-118. https://doi.org/10.1108/JHTT-09-2016-0058

Wang, C., & Zhang, P. (2012). The evolution of social commerce: The people, management, technology, and information dimensions. *Communications of the Association for Information Systems*, *31*, 105-126. https://doi.org/10.17705/1CAIS.03105

West, S., Naar, J. J., Son, J. S., & Liechty, T. (2019). Promoting team sport participation among older women. *Journal of Park and Recreation Administration*, *37*(4). https://doi.org/10.18666/JPRA-2019-9118

Xiang, Z., & Fesenmaier, D. R. (2017). Big data analytics, tourism design and smart tourism. In Z. Xiang & D. R. Fesenmaier (Eds.), *Analytics in smart tourism design concepts and methods* (pp. 299-306). Springer International Publishing.

Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, *31*(2), 179–188. https://doi.org/10.1016/j.tourman.2009.02.016

Yuan, Y., Tseng, Y.-H., & Ho, C.-I. (2019). Tourism information technology research trends: 1990-2016. *Tourism Review*, *74*(1), 5-19. https://doi.org/10.1108/TR-08-2017-0128

Zeren, D., & Kaya, N. (2020). Dijital pazarlama: Ulusal yazının bibliyometrik analizi. *Çağ Üniversitesi Sosyal Bilimler Dergisi*, *17*(1), 35-52. https://dergipark.org.tr/tr/pub/cagsbd/issue/55510/760038

Zhang, Z. (2019). Visualization analysis of the development trajectory of knowledge sharing in virtual communities based on CiteSpace. *Multimedia Tools and Applications*, *78*(21), 29643-29657. https://doi.org/10.1007/s11042-018-6061-y