A Retrospective Analysis of Information Technology in Tourism Research

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Abstract

The tourism industry has experienced a profound evolution in recent years, largely due to the influence of information technology. The rapid advancement of information technology has revolutionized the tourism sector. This study gives an overview of the research in Information Technology and Tourism from 2014 to 2023. The aim is to identify the publication trends, conceptual structure, intellectual structure, and collaboration structure with the help of bibliographic analysis including descriptive, co-citation, co-word and collaboration analysis. Scopus database was used to obtain the data for the study. 203 research articles published between 2014 and 2023 were extracted from the Information Technology and Tourism (ITT) journal and the data was analysed using the biliometrix tool of the R software version 4.3.1 and VOSviewer. Information Technology and Tourism (ITT) is the first scientific interdisciplinary journal focusing on the nature and role of information technology within the context of tourism, travel and hospitality. The findings of the study indicate that research in Information Technology and Tourism has shown remarkable growth in terms of both publications and citations, with a pronounced emphasis on collaborative research. Keyword and co-word analysis highlighted the applications of technology in the tourism and hospitality sector.

Keywords Bibliometric analysis; information technology and tourism; co-word analysis; co-citation analysis; collaboration analysis

Introduction

The tourism industry has experienced a profound evolution in recent years, largely due to the influence of information technology. The rapid advancement of information technology has revolutionized the tourism sector. Information technology has ushered in an era of personalization within the tourism industry to meet the diverse demands of tourists. With the help of new technologies like big data, machine learning, and artificial intelligence, travel companies get new insights into market preferences, create customized itineraries, and suggest destinations and services to tourists. Technological advancements have transformed the way tourists gather information, plan their trips, make reservations, and share their experiences. Investing in digital information and technology improves the destination's image, which in turn significantly influence tourist decisions in favour of visiting (Sifolo, 2023). Information technology has been continuously contributing to shaping the future of the tourism industry in a highly competitive environment (Tiso & Melani, 2023). Over the years, numerous studies have explored the impact of information technology on different aspects of tourism research (Xiang, 2018). One of the earliest recognitions of the importance of technology in tourism was highlighted by Pauline Sheldon in 1987 in her book "Tourism Information Technology" where she emphasized that tourism is an "information-intensive" industry and provided examples of various IT applications in different tourism sectors. The significance of technology in tourism research can be seen in its role as a strategic tool for the industry (Buhalis & Law, 2008). It enables tourism businesses to streamline their operations, improve efficiency, and enhance customer experiences (Law et al., 2009). Furthermore, information technology has also played a crucial role in shaping the way tourism research is conducted. Researchers now have access to vast amounts of data and resources through online platforms and digital databases, allowing for more comprehensive and in-depth analyses. Research in Information technology and tourism has evolved from being a marketing-driven tool to a knowledge-creation tool (Xiang, 2018). Trends in information technology and tourism have shown that the integration of IT in the tourism industry has had profound effects on various aspects of tourism research.

The current study aims to understand the latest research and academic patterns in information technology's role in the tourism industry, using bibliometric and thematic analyses. The resultant findings seek to offer valuable insights to the academic community, illuminating potential areas for further research at the intersection of information technology and tourism. Consequently, these findings can help stakeholders implement necessary measures to continuously integrate relevant technologies within the tourism industry and facilitate its adaptation to the digital era. Bibliometric studies enable the assessment of research quality, the identification of emerging trends, and an overview of key studies in a particular field. It helps in exploring, organizing, and analysing large amounts of data to know the past, understand the advances in the research field, and allow the development of future lines of research (Gaviria-Marin et al., 2018). The bibliometric analysis method offers a comprehensive perspective on publications across various domains, including subjects, authors, journals, educational institutions, and nations (Farrukh et al., 2020). The widespread use of bibliometric analysis has been encouraged in various disciplines such as business and management. In the current scholarly and research environment, it is extensively employed for

the comprehensive examination of ideas and theories. The study aims to analyse the research documents published between 2014 and 2023 with a total number of 203 papers which will reveal the trends in information technology and tourism research. The study has the following objectives:

- To identify the publication trends in Information technology and tourism research such as the structure of publication and citation, most influential articles, and productive authors, countries, and institutions.
- To determine the conceptual and intellectual structure using co-word and co-citation analysis.
- To show the relationship between contributors through a collaboration structure

Methods and data

In order to study the role of Information Technology in Tourism research, data i.e., research publications related to the theme of Information Technology and Tourism were extracted from the Scopus database. The Information Technology and Tourism (ITT) journal was selected as the source of these research articles. Information Technology & Tourism (ITT) is a unique scientific journal that explores the impact of information technology on tourism, travel, and hospitality. It aims to advance theoretical frameworks, support industry-oriented and academic research, and presents various perspectives on the IT-tourism relationship. The journal publishes research papers, reviews, case studies, and analyses of industry practices, considering diverse national contexts. For maintaining the academic quality and standards, ITT has been indexed in SCOPUS database since 2014 and has secured a tremendous 15th rank out of 141 journals in Tourism, Leisure and Hospitality Management category in SCOPUS for the year 2022 and during the same period, it published quality research documents.The study focuses on the research articles published in ITT from 2014 to 2023. Bibliometric analysis was used to study the 203 research articles published in ITT. The concept of bibliometrics was developed by Pritchard (1969, p. 349) to encompass the application of mathematics and statistical methods for books and other media (Collado et al., 2022). Bibliometric analysis has been increasingly utilized these days to study the structure and progression of scientific disciplines (Boyack et al., 2005; Koseoglu et al., 2016; Zupic&Čater, 2015). In this study, bibliometric indicators have been developed to study the academic output and understand the structural and dynamic aspects of scientific search (Singh et al., 2021).

The bibliographic data for the study was accessed from the Scopus database, the largest multi-disciplinary database of peer-reviewed literature in social science research (Bartol et al., 2014; Donthu et al., 2020; Norris & Oppenheim, 2007). Bibliometrix tool of the R software version 4.3.1 was used for the data mining which was conducted to analyse the bibliographic data of the research articles published in ITT between 2014 to 2023.Table 1 depicts the main information regarding the articles selected for analysis in the research article. The analysis includes the following:

- Publication and citation structure analysis
- Most productive authors, countries and institutions analysis
- Most cited documents analysis
- Co-citation analysis
- Co-word analysis
- Collaboration analysis

Co-citation analysis indicates conceptual or intellectual similarities between the citing and cited documents (Small, 1973). Co-authorship illustrates authorship patterns and connections among collaborating authors (Koseoglu, 2016; Peters & Van Raan, 1991), and co-occurrence of keywords portrays the conceptual or knowledge structure of the literature (Callon, Courtial, Turner, & Bauin, 1983; Cheng, Huang, Yu, & Wu, 2018).

Table 1: Main Information

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2014:2023
Sources (Journals, Books, etc)	1
Documents	203
Annual Growth Rate %	1.4
Document Average Age	4.22
Average citations per doc	21.42
References	11941
DOCUMENT CONTENTS	
Keywords Plus (ID)	0
Author's Keywords (DE)	819
AUTHORS	
Authors	527
Authors of single-authored docs	21
AUTHORS COLLABORATION	
Single-authored docs	21
Co-Authors per Doc	3.07
International co-authorships %	28.57
DOCUMENT TYPES	
article	196
review	7

Results

The results are presented in this section of the research article.

Publication and citation structure

As per the data extracted from the Scopus database, ITT has published 203 scholarly articles (196 research articles and 07 reviews) between the years 2014 and 2023 as shown in the Figure 1. In terms of publications (Table 2), the first four years saw a total of 67 articles published with an average of 16.75 articles each year. Last six years witnessed a steady increase in the number of publications with each year having 20 or more number of publications. 17 research articles have been published in the year 2023.The total citations received by these publications was 4348. As per Mulet-Forteza et al. (2020), a threshold of minimum citations should be used to understand the citation structure. Therefore, the study used citation threshold of 100, 50, 20 and 1. The data revealed that 03 articles have received total citations of more than 100, 14 articles have received total citations of more than 50 and 47 articles have received total citations of more than 20 respectively. ITT received maximum citations in the year 2020 i.e., 1081 as a result of 06 publications with citations of more than 50 that year (Table 7). The year 2020 also saw the maximum mean total citation of 10.01. The following years witnessed a steady decline in the citation trends due to the presence of newer articles with lesser number of years since publication. The citations of these recently published articles will steadily increase over the years (Mulet-Forteza et al., 2019) leading to an increase in the overall citation count of ITT.
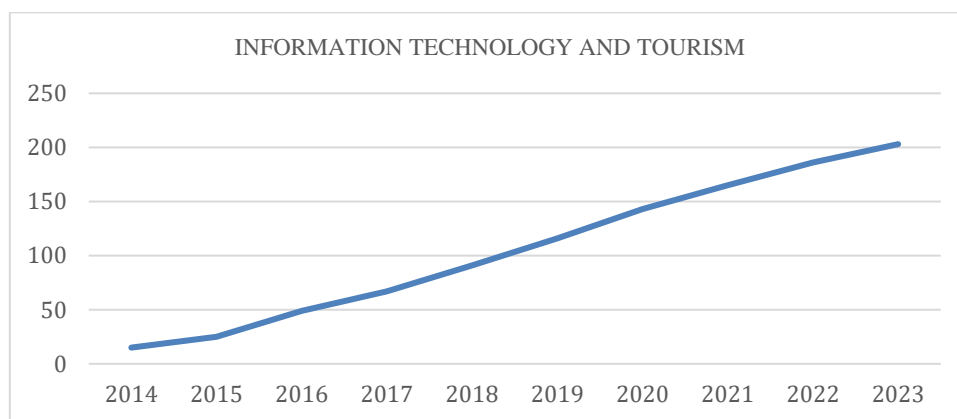
Figure 1: Graph showing the annual scientific production from the year 2014 to 2023

Table 2: Publication and citation structure

Year	N	TC	>100	>50	>20	>1	MTCY
2014	15	412	1	2	1	11	2.75
2015	10	335	1	1	3	5	3.72
2016	24	708	1	2	9	12	3.69
2017	18	546	0	2	8	8	4.33
2018	24	544	0	2	11	11	3.78
2019	25	304	0	0	5	20	2.43
2020	27	1081	2	4	6	15	10.01
2021	22	287	0	1	4	16	4.35
2022	21	124	0	0	2	14	2.95
2023	17	7	0	0	0	4	0.41

Most productive authors, countries and institutions

According to Sharma et al. (2020), most productive authors, countries and institutions are the important indicators in the bibliometric studies to identify the leading contributors pertaining to a particular domain. Table 3 shows the most productive authors who have published their research works in the ITT. As per the findings, 483 authors had published their research works in ITT and Gretzel U from University of Southern California, USA, emerged as the most productive author in terms of number of publications (NP), total citations (TC), h index, g index and m index. She has published 12 articles with total citations of 671. Neidhardt J from Vienna University of Technology, Austria, is the second most productive author with 07 publications and 573 total citations. The findings also revealed that 32 authors had more than 100 citations.

Table 4 shows the country-wise productivity in terms of publication of research articles in ITT. Table 5 shows the country-wise productivity in terms of total citations in ITT. As per the data, authors from 41 countries had contributed their scholarly works in ITT. Spain is the leading country in terms of number of publications (F) with 65 research articles and Italy tops the list in terms of total citations (TC) with 633 citations respectively. Spain, Italy, USA and China were the 04 countries which had more than 50 articles published in ITT while 12 countries had more than 200 total citations (see Table 5). This shows that Spain, Italy, Austria and USA have extensively contributed to the information technology and tourism literature.

Table 3: Most productive authors

Rank	Authors	h_index	g_index	m_index	TC	NP
1	GRETZEL U	9	12	1	671	12
2	NEIDHARDT J	7	7	0.778	573	7
3	ZANKER M	4	5	0.4	515	5
4	BAGGIO R	6	6	0.6	484	6
5	FUCHS M	6	6	0.6	454	6
6	XIANG Z	3	3	0.375	331	3
7	PESONEN J	3	3	0.333	322	3
8	LAW R	1	4	0.25	283	4
9	HOEPKEN W	1	1	0.25	282	1
10	RICCI F	6	6	0.6	275	6
11	WERTHNER H	5	6	0.556	236	6
12	JANNACH D	2	2	0.2	171	2
13	STOCK O	2	2	0.222	170	2
14	PENCARELLI T	1	1	0.25	160	1
15	BUONINCONTRI P	1	1	0.125	154	1
16	MICERA R	1	1	0.125	154	1
17	DICKINGER A	2	2	0.222	140	2
18	STANGL B	2	2	0.222	130	2
19	SCAGLIONE M	3	3	0.333	126	3
20	IVANOV S	2	2	0.5	124	2
21	CANTONI L	2	2	0.222	120	2
22	STANKOV U	2	3	0.5	111	3
23	BILGIHAN A	1	1	0.1	111	1
24	BUJISIC M	1	1	0.1	111	1
25	NUSAIR K	1	1	0.1	111	1
26	OKUMUS F	1	1	0.1	111	1
27	NGUYEN TN	2	2	0.333	109	2
28	MARINE-ROIG E	4	4	0.5	105	4
29	MURA P	2	2	0.286	104	2
30	PAHLEVAN SHARIF S	2	2	0.286	104	2
31	ALZUA-SORZABAL A	1	1	0.111	102	1
32	PRÖLL B	1	1	0.111	102	1

Table 4: Most productive countries in terms of number of publications (F)

Rank	Country	F
1	Spain	65
2	Italy	61
3	USA	56
4	China	53
5	Australia	45
6	Austria	42
7	Portugal	25
8	Germany	21
9	Switzerland	20
10	Japan	18

Table 5: Most productive countries in terms of total citations (TC)

Rank	Country	TC	Average Article Citations
1	Italy	633	33.30
2	Austria	570	33.50
3	USA	553	30.70
4	Spain	345	17.20
5	Australia	235	18.10
6	United Kingdom	230	28.80
7	China	194	13.90
8	Serbia	148	29.60
9	Malaysia	133	26.60
10	Bulgaria	124	62.00
11	Germany	115	23.00
12	Switzerland	109	21.80

Table 6 depicts the institution-wise research productivity in terms of number of articles published in ITT. The data shows that authors from 251 institutions had published their scholarly works in ITT and Free University of Bozen-Bolzano, Italy is the leading contributor with 14 articles. Modul University Vienna, Austria is second in the list with 12 publications. The data further revealed that 27 institutions had 5 and more research articles published in ITT. The institutions from European countries dominated the list with institutions from Italy, Spain, Austria and Portugal featuring in the top 10 most productive institutions. Table 6: Most productive institutions.

Table 6: Most productive institutions

| Rank	Institutions	Number of Articles
1	FREE UNIVERSITY OF BOZEN-BOLZANO	14
2	MODUL UNIVERSITY VIENNA	12
3	UNIVERSITY OF NOVI SAD	10
4	THE HONG KONG POLYTECHNIC UNIVERSITY	9
5	UNIVERSITY OF LLEIDA	8
6	UNIVERSITY OF SOUTHERN CALIFORNIA	8
7	VIENNA UNIVERSITY OF TECHNOLOGY	8
8	SCHOOL OF TECHNOLOGY AND MANAGEMENT OF LAMEGO	7
9	UNIVERSITÀ POLITECNICA DELLE MARCHE	7
10	CITY UNIVERSITY OF MACAU	6
11	MID-SWEDEN UNIVERSITY	6
12	MULTIMEDIA UNIVERSITY	6
13	UNIVERSITY OF L'AQUILA	6
14	UNIVERSITY OF MACAU	6
15	UNIVERSITY OF TASMANIA	6
16	BEIJING UNIVERSITY OF TECHNOLOGY	5
17	BOCCONI UNIVERSITY	5
18	GRIFFITH UNIVERSITY	5
19	INSTITUTO UNIVERSITÁRIO DE LISBOA (ISCTE-IUL)	5
20	NANKAI UNIVERSITY	5
21	POLYTECHNIC INSTITUTE OF CASTELO BRANCO	5
22	UNIVERSITY OF CASTILLA-LA MANCHA	5
23	UNIVERSITY OF EASTERN FINLAND	5
24	UNIVERSITY OF PATRAS	5
25	UNIVERSITY OF QUEENSLAND	5
26	UNIVERSITÀ DELLA SVIZZERA ITALIANA	5
27	VICTORIA UNIVERSITY	5

Influential papers

Table 7 depicts the most influential papers between 2014 and 2023 based on the data extracted from the Scopus database. The table shows the top 20 publications each having 48 and more citations out of the 203 total scholarly articles published in ITT till September 2023. The research article published by Gretzel, U, (2020) titled "e-Tourism beyond COVID-19: a call for transformative research" is the most cited article with 282 total citations. The viewpoint article discusses that the impacts of novel-coronavirus COVID-19 calls for transformative e-tourism research. The second most influential paper is by Pencarelli, T (2020) titled "The digital revolution in the travel and tourism industry" with 160 citations. The research article studies the impact of digital revolution on the tourism sector and discusses how tourism 4.0 technologies will change the experiences of both guests and local residents. The data further reveals that each of the top 05 publications have more than 100 citations. Only 03 papers in the list are single-authored while others are multi-authored.

Table 7: Most cited documents

Rank	Paper	Total Citations	TC per Year
1	GRETZEL U, 2020	282	70.50
2	PENCARELLI T, 2020	160	40.00
3	BUONINCONTRI P, 2016	154	19.25
4	BILGIHAN A, 2014	111	11.10
5	WERTHNER H, 2015	102	11.33
6	VALERI M, 2021	84	28.00
7	MURA P, 2017	84	12.00
8	STANKOV U, 2020	83	20.75
9	IVANOV S, 2020	83	20.75
10	HARDY A, 2017	79	11.29
11	BAGGIO R, 2014	72	7.20
12	JANNACH D, 2014	69	6.90
13	LAU A, 2020	68	17.00
14	KUFLIK T, 2015	68	7.56
15	ROSSETTI M, 2016	58	7.25
16	DELIC A, 2018	56	9.33
17	NGUYEN TN, 2018	53	8.83
18	TATAR ŞB, 2016	53	6.63
19	COOK D, 2020	51	12.75
20	WÖRNDL W, 2017	48	6.86

Co-citation analysis
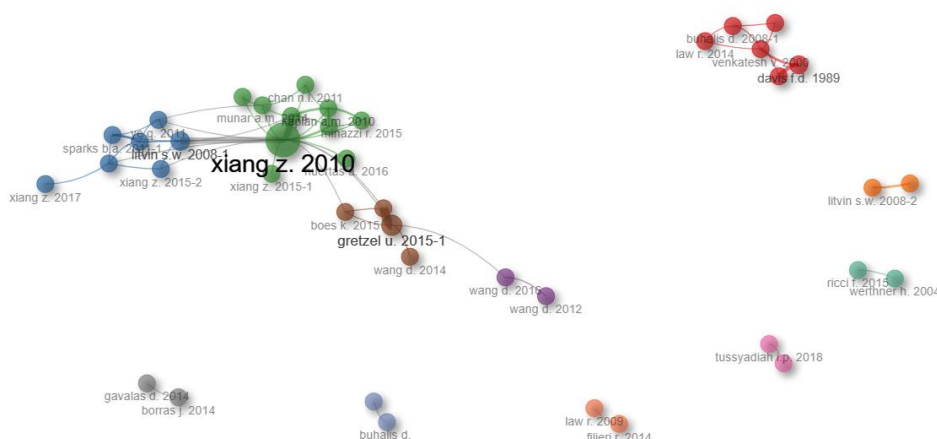
Figure 2: Co-citation network

Figure 2 displays the co-citation network of the research work published in ITT. The size of the node depicts the number of citations the articles has received and the strength of co-citation is depicted by the thickness of the connecting line between two nodes (Singh et al., 2022). The results indicate 11 clusters. The study highlights the top 3 clusters i.e., green, blue and red with more than 5 inter-connected research articles. The largest structure is the green cluster with 10 research articles. The green cluster consists of articles related to the prominence of social media in the travel and tourism sector. The articles investigate how social media has impacted travel information search, consumer behaviour, destination marketing, and user-generated content and social media marketing strategies within the context of tourism industry. The highest cited article (Xiang, Z., 2010) in the cluster confirms the importance of social media in tourism. The second most cited article in the cluster (Hays et al., 2013) studied the top National Tourism Organizations (NTOs) of the world's leading destination in their usage of social media in engaging consumers and marketing destinations. The findings of the study revealed that the NTOs were still in their nascent stage in the usage of social media for marketing strategies and engaging consumers and needed to be more creative and adaptive to social media. Yusrini et al. (2024) found that adoption of technology, especially social media, serves as an effective mechanism for accomplishing task with precise solutions thereby exerting a positive influence on tourist.

Second is the blue cluster with 07 references. The underlying theme in this cluster is the effect of online reviews and electronic word of mouth on the tourism and hospitality sector. The research articles collectively focus on the analysis of customer satisfaction and dissatisfaction through online reviews and highlight the importance of understanding customer sentiments in this era of social media. The most cited article (Litvin et al., 2008) identifies electronic word of mouth as a cost-effective marketing strategy for tourism and hospitality industry. Ye et al. (2011) investigated the impact of online user-generated reviews on business performance and found that the online reviews had a significant impact on the sales. Berezina et al (2016) used text mining approach to study the online reviews of satisfied and dissatisfied customers. The study found that satisfied customers refer intangible aspects whereas dissatisfied customers refer tangible aspects while recommending a hotel in their online reviews.

Third is the red cluster with 06 references. The articles in this cluster were related to the acceptance, use and impact of technology on tourism and hospitality industry. The most cited article in this cluster (Venkatesh, V., 2000) explored the factors influencing the perception of ease of using information technologies over time. This study found that the initial perceptions were anchored by control (internal and external), intrinsic motivation and emotion. But, with experience, perceptions tend to adjust as per the objective usability and external control specific to the new system environment and system-specific perceived enjoyment. The second most cited article in this cluster (Buhalis, D., 2008) reviewed the articles published on the topic of eTourism from the period 1988 to 2008 i.e., 20 years. The article not only predicted the future of eTourism but it also highlighted the future challenges for tourism researchers.

Co-word analysis
Table 7 depicts the frequently occurred keywords in the research articles published in ITT. Figure 3 is the representation of these keywords in the form of a word cloud. Author's keywords highlight the content and theme of the research work (Sharma, et al., 2020). The data shows that "tourism", "social media" and "smart tourism" are the most frequently used keywords with the frequency of 20, 18 and 8 respectively. These keywords were followed by big data (7), hotel (7), text mining (7), e-tourism (6), recommender systems (6) and sentiment analysis (6).

Table 7: Frequently occurred keywords

Terms	Frequency
Tourism	20
Social media	18
Smart tourism	8

|	
Big data	7
Hotel	7
Text mining	7
E-tourism	6
Recommender systems	6
Sentiment analysis	6
Covid-19	5
Metaverse	5
Online reviews	5
Blockchain	4
Hospitality	4
Social network analysis	4
Technology	4
Travel	4
Virtual reality	4
China	3
Cluster analysis	3
Co-creation	3
Content analysis	3
Disintermediation	3
Domestic tourism	3
Emotions	3
Facebook	3
Hospitality industry	3
Ict	3
Information and communication technology	3
Linked data	3
Natural language processing	3
Technology adoption	3
Tourism 4 0	3
Tourism destinations	3
Tourism experience	3
Travel recommender systems	3
Tripadvisor	3
Virtual tourism	3
Web 2 0	3
Well-being	3
Accessible tourism	2
Authenticity	2
Automation	2
Business intelligence	2
Context-aware recommender systems	2
Continuance intention	2
Customer satisfaction	2
Data mining	2
Deep learning	2
Destination image	2

Figure 3: Word Cloud

In terms of co-word analysis, VOSviewer software was used to generate keyword co-occurrence clustering. A total of 12 keywords with a frequency of ≥ 5 were selected from 819 keywords and a co-occurrence analysis was performed on these 819 keywords, as depicted in Figure 4. The size of nodes and the font size are determined by the weight of the keyword. If the weight value is higher, indicating more frequent appearance of the keyword, the node and font size will be larger. Lines connecting nodes signify shared occurrences of keywords. The thickness of these lines represents the strength of co-occurrence between the two keywords. A thicker line indicates a stronger co-occurrence, meaning that the two keywords appear together more frequently (Feng, L. & Chen, Q., 2020). From the analysis, 05 clusters were obtained i.e., red, blue, green, yellow, orange and purple. Red cluster is the biggest cluster with the underlying theme of usage of technology in the tourism and hospitality sector.

Figure 4: A screenshot of the bibliometric map created based on author keywords co-occurrence with network visualization mode

- **Collaboration analysis**
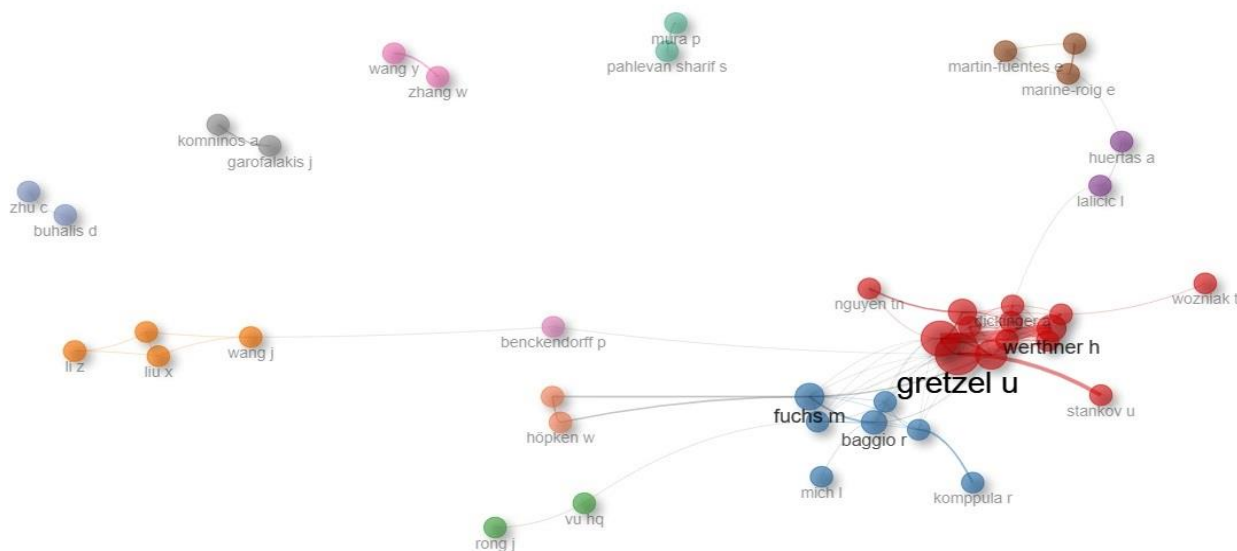
Figure 5: Authors' collaboration analysis

Figure 5 shows the authors' collaboration network analysis. The collaboration network shows the research groups indicating specific topics and how they are related along with the largest research group in the analyzed area (Siccardi, S. & Valentina, V., 2022). Authors' collaboration analysis depicts 12 clusters with the red cluster as the biggest cluster with 14 authors. The red group was composed of:

- Ulrike Gretzel, Senior Fellow, University of Southern California
- Julia Neidhardt, Researcher, TU Wien, Austria
- Francesco Ricci, Professor of Computer Science, Free University of Bozen-Bolzano, Italy
- Hannes Werthner, Professor, TU Wien, Austria
- Markus Zanker, Free University of Bozen-Bolzano, Italy
- Miriam Scaglione, Professor, University of Applied Sciences and Arts, Western Switzerland
- UglješaStankov, Full Professor, Faculty of Sciences, University of Novi Sad, Serbia
- Lorenzo Cantoni, UniversitàdellaSvizzeraitaliana, Switzerland
- Astrid Dickinger, Full Professor, MODUL University, Vienna
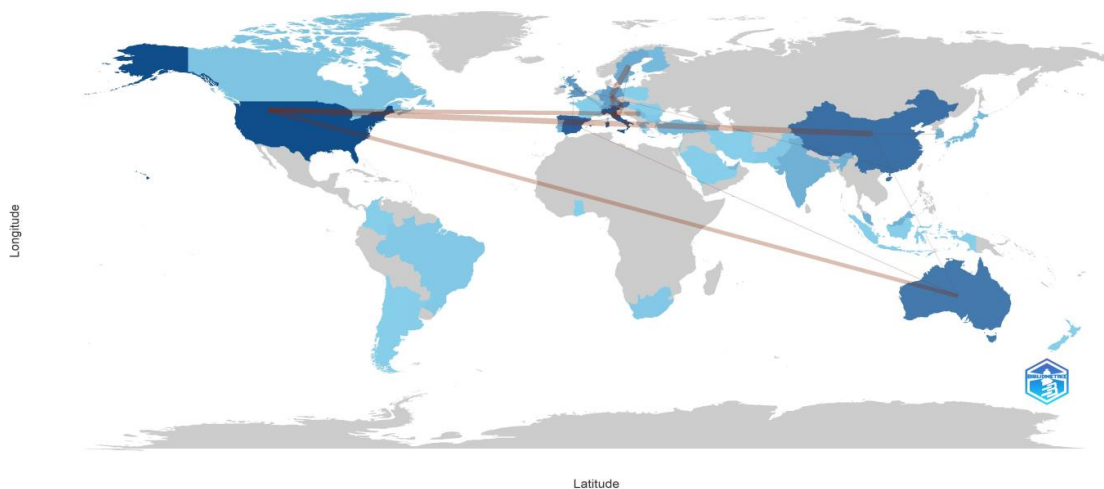- Dietmar Jannach, University of Klagenfurt, Austria

- Thuy-Ngoc Nguyen, University of Dayton, USA
- Brigitte Stangl, Senior Lecturer, University of Surrey
- Oliviero Stock, Senior Fellow, Italy
- Thomas Wozniak, Lucerne University of Applied Sciences and Arts, Switzerland

Table 8: World collaboration

From	To	Frequency
GERMANY	SWEDEN	4
ITALY	AUSTRIA	4
USA	CHINA	4
AUSTRIA	GERMANY	3
ITALY	GERMANY	3
USA	AUSTRALIA	3
USA	SERBIA	3
AUSTRIA	SWEDEN	2
AUSTRIA	SWITZERLAND	2
CHINA	AUSTRALIA	2
CHINA	KOREA	2
ITALY	NETHERLANDS	2
ITALY	UNITED KINGDOM	2
SPAIN	AUSTRALIA	2
SPAIN	AUSTRIA	2
SPAIN	ITALY	2
SPAIN	PORTUGAL	2
SPAIN	UNITED KINGDOM	2
SWITZERLAND	UNITED KINGDOM	2
UNITED KINGDOM	HONG KONG	2

Figure 6: Country collaboration map

Table 8 and figure 6 depicts the collaboration between the countries of the world in terms of publication of research articles in ITT. As per the results, Germany and Sweden, Italy and Austria, and USA and China have emerged as the top collaborating countries with 04 articles each in ITT.

Conclusion

This comprehensive bibliometric analysis of the Information Technology and Tourism (ITT) journal from 2014 to 2023 sheds significant light on the role of Information Technology in Tourism Research through the analysis of publication trends, conceptual structure, intellectual structure, and collaboration structure. The findings indicate that research in Information Technology in Tourism has shown remarkable growth in terms of both publications and citations, with a greater emphasis on collaborative research. The ITT journal has received a substantial number of citations, with several articles garnering significant attention. The co-word analysis and keyword frequency identified prominent themes, including "tourism," "social media," and "smart tourism." These keywords reflect the ongoing relevance of technology in the tourism sector and the industry's adaptation to the digital age. The analysis also revealed the significant contributions made by various authors, countries, and institutions, in shaping the content and trajectory of the journal. The top authors, countries, and institutions in the field of Information Technology in Tourism have been identified, emphasizing the global and collaborative nature of the research in the field. Institutions from European countries, particularly Italy, Spain, Austria, and Portugal, emerged as leading contributors. The USA and China are other standout contributors. Meanwhile, authors from 41 diverse countries contributed to the ITT, underlying the growing interest of the subject amongst the global researchers. Co-word analysis highlighted that the application of technology in the tourism and hospitality sector has been the recurrent theme in the published research articles in the journal highlighting its importance.This study also has some limitations. Firstly, the study only included research articles extracted from the Information Technology and Tourism (ITT) journal which is indexed in the SCOPUS database. Future studies can

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focus on other top tier journals publishing on Information Technology and Tourism as well as extract data from databases such as Web of Science, Lens, Dimensions, Google Scholar etc. Secondly, only research articles and review papers in the English language were included in the study. Thus, conference proceedings and book chapters on the subject were not included due to the nature of the selected journal. A future study devoid of the mentioned limitations would present a comprehensive picture of the status of tourism research related to Information Technology.

References

Baggio, R., & Del Chiappa, G. (2014). Real and Virtual Relationships in Tourism Digital Ecosystems. *Information Technology & Tourism*, 14, 3-19.https://doi.org/10.1007/s40558-013-0001-5

Bartol, T., Budimir, G., Dekleva-Smrekar, D. (2014). Assessment of Research Fields in Scopus and Web of Science in the View of National Research Evaluation in Slovenia. *Scientometrics* 98, 1491–1504. https://doi.org/10.1007/s11192-013-1148-8

Berezina, K., Bilgihan, A., Cobanoglu, C. & Okumus, F. (2016). Understanding Satisfied and Dissatisfied Hotel Customers: Text Mining of Online Hotel Reviews. *Journal of Hospitality Marketing & Management*, *25*(1), 1-24. https://doi.org/10.1080/19368623.2015.983631

Bilgihan, A., Okumus, F., Nusair, K. & Bujisic, M. (2014). Online Experiences: Flow Theory, Measuring Online Customer Experience in e-Commerce and Managerial Implications for the Lodging Industry. *Information Technology & Tourism*, 14, 49-71.https://doi.org/10.1007/s40558-013-0003-3

Boyack, K., Klavans, R., & Börner, K. (2005). Mapping the Backbone of Science. *Scientometrics*, 64 (3), 351–374. https://doi.org/10.1007/s11192-005-0255-6

Buhalis, D. & Law, R. (2008). Progress in Information Technology and Tourism Management: 20 Years on and 10 Years After the Internet—The State of Ecotourism Research. *Tourism Management*, 29(4), 609-623. https://doi.org/10.1016/j.tourman.2008.01.005

Buonincontri, P. & Micera, R. (2016). The Experience Co-Creation in Smart Tourism Destinations: A Multiple Case Analysis of European Destinations. *Information Technology & Tourism*, 16, 285-315.https://doi.org/10.1007/s40558-016-0060-5

Callon, M., Courtial, J.-P., Turner, W. A. & Bauin, S. (1983). From Translations to Problematic Networks: An Introduction to Co-Word Analysis. *Information,* 22(2), 191–235. https://dx.doi.org/10.1177/053901883022002003

Cheng, F.-F., Huang, Y.-W., Yu, H.C. & Wu, C.-S. (2018). Mapping Knowledge Structure by Keyword Co-occurrence and Social Network Analysis. *Library Hi Tech*, 36(4), 636–650. https://doi.org/10.1108/lht-01-2018-0004.

Cook, D. (2020). The Freedom Trap: Digital Nomads and the Use of Disciplining Practices to Manage Work/Leisure Boundaries. *Information Technology & Tourism*, 22(3), 355-390.https://doi.org/10.1007/s40558-020-00172-4

Delic, A., Neidhardt, J., Nguyen, T. N. & Ricci, F. (2018). An Observational User Study for Group Recommender Systems in the Tourism Domain. *Information Technology & Tourism*, 19, 87-116.https://doi.org/10.1007/s40558-018-0106-y

Donthu, N., Kumar, S., & Pattnaik, D. (2020). Forty-five years of Journal of Business Research: A bibliometric analysis. *Journal of Business Research*, *109*, 1-14. https://doi.org/10.1016/j.jbusres.2019.10.039

Farrukh, M., Meng, F., Raza, A. & Tahir, M. S. (2020). Twenty-seven years of Sustainable Development Journal: A Bibliometric Analysis. *Sustainable Development*, 28(6), 1725–1737. https://doi.org/10.1002/sd.2120

Feng, L. & Chen, Q. (2020, August). Bibliometric Analysis of the Synthesis of Nanocatalyst (1999–2018). In *IOP Conference Series: Earth and Environmental Science*, 558, (4), 042042. IOP Publishing. https://doi.org/10.1088/1755-1315/558/4/042042

Gaviria-Marin, M., Merigo, J. M. & Popa, S. (2018). Twenty Years of the Journal of Knowledge Management: A Bibliometric Analysis. *Journal of Knowledge Management*, 22(8), 1655–1687. https://doi.org/10.1108/JKM-10-2017-0497

Gretzel, U., Fuchs, M., Baggio, R., Hoepken, W., Law, R., Neidhardt, J. & Xiang, Z. (2020). e-Tourism Beyond COVID-19: A Call for Transformative Research. *Information Technology & Tourism*, 22, 187-203.https://doi.org/10.1007/s40558-020-00181-3

Güzeller, C. O. &ÇeliKer, N. (2018). Bibliometric Analysis of Tourism Research for the Period 2007-2016. *Advances in Hospitality and Tourism Research*, 6(1), 1–22. https://doi.org/10.30519/ahtr.446248

Hardy, A., Hyslop, S., Booth, K., Robards, B., Aryal, J., Gretzel, U. & Eccleston, R. (2017). Tracking Tourists' Travel with Smartphone-Based GPS Technology: A Methodological Discussion. *Information Technology & Tourism*, 17, 255-274. https://doi.org/10.1007/s40558-017-0086-3

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

Ivanov, S., Seyitoğlu, F. & Markova, M. (2020). Hotel Managers' Perceptions Towards the Use of Robots: A Mixed-Methods Approach. *Information Technology & Tourism*, 22, 505-535.https://doi.org/10.1007/s40558-020-00187-x

Jannach, D., Zanker, M. & Fuchs, M. (2014). Leveraging Multi-criteria Customer Feedback for Satisfaction Analysis and Improved Recommendations. *Information Technology & Tourism*, 14, 119-149.https://doi.org/10.1007/s40558-014-0010-z

Koseoglu, M. A., Rahimi, R., Okumus, F. & Liu, J. (2016). Bibliometric Studies in Tourism. *Annals of Tourism Research*, *61*, 180-198. https://doi.org/10.1016/j.annals.2016.10.006

Kuflik, T., Wecker, A. J., Lanir, J. & Stock, O. (2015). An Integrative Framework for Extending the Boundaries of the Museum Visit Experience: Linking the Pre, During and Post Visit Phases. *Information Technology & Tourism*, 15, 17-47.https://doi.org/10.1007/s40558-014-0018-4

Lau, A. (2020). New Technologies Used in COVID-19 for Business Survival: Insights from the Hotel Sector in China. *Information Technology & Tourism*, 22(4), 497-504.https://doi.org/10.1007/s40558-020-00193-z

Law, R., Leung, R. & Buhalis, D. (2009). Information Technology Applications in Hospitality and Tourism: A Review of Publications from 2005 To 2007. *Journal of Travel & Tourism Marketing*, 26(5-6), 599-623. https://doi.org/10.1080/10548400903163160

Litvin, S. W., Goldsmith, R. E. & Pan, B. (2008). Electronic word-of-mouth in hospitality and tourism management. *Tourism Management*, *29*(3),458-468. https://doi.org/10.1016/j.tourman.2007.05.011

Michael Hall, C. (2011). Publish and perish? Bibliometric Analysis, Journal Ranking and the Assessment of Research Auality in Tourism. *Tourism Management*, 32(1), 16–27. https://doi.org/10.1016/j.tourman.2010.07.001

Molina-Collado, A., Gómez-Rico, M., Sigala, M. (2022). Mapping Tourism and Hospitality Research on Information and Communication Technology: A Bibliometric and Scientific Approach. *Information Technology and Tourism* 24, 299–340. https://doi.org/10.1007/s40558-022-00227-8

Mulet-Forteza, C., Genovart-Balaguer, J., Merigó, J. M. &Mauleon-Mendez, E. (2019). Bibliometric Structure of IJCHM in its 30 years. *International Journal of Contemporary Hospitality Management,* 31(12), 4574–4604. https://doi.org/10.1108/IJCHM-10-2018-0828

Mulet-Forteza, C., Lunn, E., Merigó, J. M. & Horrach, P. (2020). Research Progress in Tourism, Leisure and Hospitality in Europe (1969–2018). *International Journal of Contemporary Hospitality Management*, 33(1), 48–74. https://doi.org/10.1108/IJCHM-06-2020-0521

Mura, P., Tavakoli, R. & Pahlevan Sharif, S. (2017). 'Authentic but not too much': Exploring Perceptions of Authenticity of Virtual Tourism. *Information Technology & To*urism, 17(2), 145-159. https://doi.org/10.1007/s40558-016-0059-y

Nguyen, T. N. & Ricci, F. (2018). A Chat-based Group Recommender system for tourism. *Information Technology & Tourism*, 18, 5-28.https://doi.org/10.1007/s40558-017-0099-y

Norris, M. & Oppenheim, C. (2007). Comparing Alternatives to the Web of Science for Coverage of the Social Sciences' Literature. *Journal of Informetrics*, 1(2), 161–169. https://doi.org/10.1016/j.joi.2006.12.001

Pencarelli, T. (2020). The Digital Revolution in the Travel and Tourism Industry. *Information Technology & Tourism*, 22(3), 455-476.https://doi.org/10.1007/s40558-019-00160-3

Peters, H. P. F. & Van Raan, A. F. J. (1991). Structuring Scientific Activities by Co-author Analysis. *Scientometrics*, 20(1), 235–255. https://doi.org/10.1007/bf02018157.

Rossetti, M., Stella, F. &VZanker, M. (2016). Analyzing User Reviews in Tourism with Topic Models. *Information Technology & Tourism*, 16, 5-21.https://doi.org/10.1007/s40558-015-0035-y

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. https://doi.org/10.1002/asi.4630240406.

Siccardi, S. & Villa, V. (2022). Trends in Adopting BIM, IoT and DT for Facility Management: A Scientometric Analysis and Keyword Co-Occurrence Network Review. *Buildings*, *13*(1), 15. https://doi.org/10.3390/buildings13010015

Singh, R., Sibi, P. S. & Sharma, P. (2021). Journal of ecotourism: a bibliometric analysis. *Journal of Ecotourism*, *21*(1), 37-53. https://doi.org/10.1080/14724049.2021.1916509

Sharma, P., Singh, R., Tamang, M., Singh, A. K. & Singh, A. K. (2020). Journal of teaching in travel & tourism: A bibliometric analysis. *Journal of Teaching in Travel & Tourism*, 1–22. https://doi.org/10.1080/15313220.2020.1845283

Stankov, U. & Gretzel, U. (2020). Tourism 4.0 Technologies and Tourist Experiences: A Human-centered Design Perspective. *Information Technology & Tourism*, 22(3), 477-488.https://doi.org/10.1007/s40558-020-00186-y

Sheldon, P J. (1987). Computers—Tourism Applications. *Tourism Management*, 8(3), 258-262. https://doi.org/10.1016/0261-5177(87)90057-4

Sifolo, P.P.S. (2023). Digital Technology Adaptability: Insights from Destination Network Practices for Tourism Businesses in South Africa. *African Journal of Hospitality, Tourism and Leisure*, 12(4), 1425-1436. https://doi.org/10.46222/ajhtl.19770720.440

Tatar, Ş. B. & Eren-Erdoğmuş, İ. (2016). The Effect of Social Media Marketing on Brand Trust and Brand Loyalty for Hotels. *Information Technology & Tourism*, 16, 249-263.https://doi.org/10.1007/s40558-015-0048-6

Tiso, I.H. & Melani, A.N. (2023). The Adoption of New Technological Advancements to Build Resilience in Hotels. African Journal of Hospitality, Tourism and Leisure, 12(5SE), 1773-1748. https://doi.org/10.46222/ajhtl.19770720.465

Valeri, M. & Baggio, R. (2021). A Critical Reflection on the Adoption of Blockchain in Tourism. *Information Technology & Tourism*, 23, 121-132.https://doi.org/10.1007/s40558-020-00183-1

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research* (11:4), 2000, 342-365. https://doi.org/10.1287/isre.11.4.342.11872

Werthner, H., Alzua-Sorzabal, A. & Cantoni, L. (2015). Future Research Issues in IT and tourism. *Information Technology and Tourism*, 15, 1–15. https://doi.org/10.1007/s40558-014-0021-9

Wörndl, W., Hefele, A. & Herzog, D. (2017). Recommending a Sequence of Interesting Places for Tourist Trips. *Information Technology & Tourism*, 17, 31-54.https://doi.org/10.1007/s40558-017-0076-5

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.

Xiang, Z. (2018). From Digitization to the Age of Acceleration: On Information Technology and Tourism. *Tourism Management Perspectives*, 25, 147-150. https://doi.org/10.1016/j.tmp.2017.11.023

Ye, Q., Law, R., Gu, B. & Chen, W. (2011). The Influence of User-Generated Content on Traveler Behavior: An Empirical Investigation on the Effects of e-word-of-mouth to Hotel Online Bookings. *Computers in Human Behavior*, *27*(2), 634-639. https://doi.org/10.1016/j.chb.2010.04.014

Yusrini, L., Eviana, N., Maeenuddin, Dorbala, R. & Darmadi, R. (2024). Understanding the Acceptance of Digital Marketing Among Tour Operators: An Empirical Study. *African Journal of Hospitality, Tourism and Leisure*, 13(1), 183-191. https://doi.org/10.46222/ajhtl.19770720.496

Zupic, I. & Čater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, 18(3), 429-472.https://doi.org/10.1177/1094428114562629