




Establishing the Influence of Technology on Travel Behaviour through Bibliometric Analysis

Abstract

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The role of technology in altering consumer behaviour is not hidden. Behavioural investigations concentrate on how people choose, pay for, consume, and reject items and services, theories, and events to meet their requirements. One such sector that regularly benefits from technological developments and advancements is the travel and tourism sector. It actively engages in the cycle of travel behaviour and has established a track record for being highly flexible in response to shifting travel preferences, technological developments, and worldwide trends. Tourism and its associated industries play vital roles in the expansion of the economy, cross-cultural discourse, and global connectedness. This industry has presented several viewpoints, resulting in changing how people choose technology to travel. Travel behaviour investigates into the reasons for travel, the types of conveyance used, the places of interest chosen, and the activities that are carried out. Understanding travel behaviour is critical for several tourism industry stakeholders, since it allows them to customise products, services, improve experiences, and reduce risks in an ever-changing travel landscape. This review examines studies from 2014 to 2024, sourced from the Scopus database using the VOSviewer software, with an aim to illustrate how technology influences travel behavior. The objective of this review is to use an illustrated bibliographic navigation of the literature to methodically, effectively, and impartially assess the state of research in this field, while also exploring prospective alternatives for future study.

Keywords Technology, Tourism, Travel Behavior, Travel Experiences, Bibliometric Analysis

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Introduction

In today's progressively linked world, technology significantly impacts several elements of travel behaviour. Consumer behaviour entails comprehending the psychological, economic, social, cultural, and situational components that influence consumer decision-making processes. Travel behaviour refers to the various activities, choices, and habits that people exhibit when taking vacations for business and/or leisure. To better understand the need for consumer behaviour, several theories have been established, some of which are based on the theory of planned behaviour, theory of reasoning, and social cognitive theory. If technology intervention is required to study behaviour, the technology acceptance model has been considered one of the essential tools (Ajzen, 1991; Davis, 1989). Researchers have examined several motivational theories and classifications within behavioural theory, as well as their applications in a range of specific situations, such as purchasing goods, consuming food, recreational activities, tourism, and travel (Mokhtarian et al., 2015). Arguably, few industries use technology as extensively as the tourism sector, where consumer usage is particularly pervasive. (Buhalis & Law, 2008) found that consumers use technology to perform a variety of tasks, including shopping, sharing ideas and experiences, gathering information, and seeking satisfaction (Cohen et al., 2014). The growth of the Internet has enabled numerous innovative business approaches. Amazon.com started as an online bookstore in 1995 and has since grown into one of the topmost online retailers. Firms in the hospitality and tourism sectors have been aggressively using Internet access as a new marketing and distribution platform since the beginning of the 1990s. New systems connecting customers and CRSs/GDSs were developed owing to the widespread use of the Internet (Xiang et al., 2015a). Consumer behaviour research considers every phase of the consumer journey, including consideration and awareness through buying and subsequent use. Several studies have highlighted that one of the biggest changes in the tourism sector has been the access travel vendors now have to a new, highly effective communication and distribution channel through the Internet (Amaro & Duarte, 2015). When using contemporary technology for tourism, travellers frequently use digital applications to gather data and seek useful travel advice from various sources (Chung & Koo, 2015).

Even though online travel agencies and other online platforms have taken over the digital information space, consumers today continue to use a variety of offline and online sources to find rich, individually pertinent data for their upcoming vacation plans, considering that the World Wide Web has become their primary means of information. With the emergence of Web 2.0, technologies are altering consumer behaviour, encouraging them to take greater ownership in planning their vacations. It also requires tourism companies to adjust their marketing methods to suit various online social media platforms. This study examines advertising efficacy on social networking sites in terms of consumers' perceptual engagement and expressed memory (Muñoz-Leiva et al., 2019). Sustained success in the tourism industry calls for recognising and capitalising on developments in an organisation's environment. The decrease in the use of printed maps and vehicle routes is a noteworthy trend resulting from technological intervention, as more people are using satellite navigation systems or location-based smartphone apps (Xiang et al., 2015a). Technology has dramatically affected travellers' perceptions. However, instead of focusing on passengers' experiences with travelling innovations, research has primarily focused on their perspectives and technology adoption. Technology-driven satisfaction is a significant challenge for researchers. Satisfaction with an online platform may stem from its characteristics as well as its suppliers, products, services, or amenities it offers (Wang et al., 2017). Travel is just one of the multiple aspects of daily life influenced by technology. This study argues that since tourism is at an



independent phase of technology use, it is impossible to separate knowledge of how smartphones influence tourist behaviour and experience from daily life usage (Wang et al., 2016).

The idea of using travel-related applications on smartphones is significantly predicted by performance expectations, social influence, cost savings, risk perception, trustworthiness, and previous usage patterns. Except for habits, usage intentions mediated most usage behaviours. It was not anticipated that variables such as hedonistic incentives, enabling circumstances, or effort expectancy would influence usage intentions or behaviours (Gupta et al., 2018). With the rise in mobile technology, the tourism industry has become increasingly dynamic and socially interconnected. This emphasises the significance of the environment in tourism and travel, particularly in today's technology-dependent society. Handheld apps for tourist guides have evolved from initial concepts to sophisticated smartphone applications that are readily available on the iTunes Store and Android marketplace (Lamsfus et al., 2015).

Current technology has outlined the usage of social media platforms, blogging, vlogging, sharing websites, travel agencies, and other technology-mediated channels which offer travellers access to travel knowledge and enable them to share their trip experiences (Cohen et al., 2014). Travel information is circulated worldwide via the world of technology, with travel blogs serving as an online equivalent of digital word-of-mouth. Countries are now paying more attention to their national brands and tourist perceptions owing to the globalisation of tourist attractions and culture (Tseng et al., 2015). This study outlines the circumstances surrounding the digital technologies used by selected enterprises in South Africa's travel, tourism, and hospitality industries. This study used Gephi, a powerful tool for network analysis and visualisation, to examine the adaptation of digital technology across diverse tourism business networks, which is particularly important in South Africa as an emerging destination. The findings identified interconnected links, interpersonal behaviours, and collaborative behaviours within the community of tourism enterprises as optimal procedures for digital technology adaption to boost the destination's viability and efficiency (Sifolo, 2023). Prospect theory indicates that in situations of uncertainty, customers optimise the worth of their alternatives and preferences. Additionally, individuals focus more on positive initiatives for certain favourable results rather than on possible improvements. Social networking platforms make it easier for consumers to connect with one another and search for services. Consequently, there has been a sharp increase in the percentage of people who understand the advantages of social media (Chung & Koo, 2015). It is challenging to locate an area where technology is nonexistent because of rapid advancement. The Pew Research Centre reported that there has been a discernible increase in the global population using smartphones and the Internet. The objective of this study is to highlight the intelligent tourism technologies that travellers use and the advantages associated with doing so. One of the primary research questions was whether innovation-enhanced tourism experiences can increase travellers' fulfilment and willingness to return (Jeong & Shin, 2020). Tourists' perceptions include a mix of concern and curiosity, and hence, require deeper analysis into the psychological aspect of their experience (De Cantis et al., 2016). The rise in smartphone application development, spurred by the growing popularity of handheld devices, has culminated in substantial changes in the travel sector and how consumers commute. Travel apps include mobile apps designed exclusively for travellers (e.g. 'Airbnb', 'TripAdvisor', and 'Skyscanner'), in addition to those used in a usual travel environment (e.g. 'Google Maps' and 'Instagram') (Lu et al., 2015). This analysis is intended to provide insights into the available literature on technological advancements in travel, followed by a bibliographic navigation between technology and travel behaviour and how it is shaping the tourism sector.

Technology influences and travel behaviour in tourism sector

The flow of knowledge from tourism to larger travel behaviour in tourism and marketing resources can be enhanced by studying the various hedonic and impacting facets of tourism consumption, as well as how both are increasingly intertwined with other aspects of usage in daily life and overall quality of life (Cohen et al., 2014). The travel sector has always faced an upsurge of novel advances in technology that posed both opportunities and challenges. Compared with the establishment of a CRS in the 1960s, global distribution systems emerged in the late 1980s, and Internet connectivity was introduced in the early 1990s (Xiang et al., 2015a). The offerings in tourism can be classified as perishable, experiential or intangible. Conventional marketing, distribution, and customer service strategies for the product usually depended on media outlets and organisations like destination marketing organisations (DMOs), and "intermediaries" like tourism companies and travel firms which interact and communicate with tourists (Xiang et al., 2015a). AI, automation, e-payments, augmented reality (AR), and simulated reality are already being used in numerous sectors and places worldwide, producing a plethora of disruptive advances (Buhalis, 2020). To provide travellers with convenient, pleasant, and delightful travel experiences, innovative tourist attractions have included a variety of technologies inspired by the way urban areas have implemented innovative technologies (Jeong & Shin, 2020). A range of technological innovations is used to enable travel at various times and locations across multiple platforms. It is important to note how travellers' use of information technology can vary depending on their context (Lamsfus et al., 2015). Tourists are becoming increasingly popular as human social lives are becoming more enriched. Advancements in big data, cloud computing, and Internet of Things (IoT) technology have caused smart tourism to develop from a concept into a technology that can completely transform life for individuals. Smart tourism can provide a large amount of rich and extensive real-time data, such as tourist sources of information, information about travel, travel routes, and additional data, which enable real-time tracking of picturesque locations and targeted advertising to customers, supporting the advancement of tourism-related businesses and improving the industry (Wei et al., 2017).

A greater knowledge of why individuals behave in specific ways or make specific choices (i.e. behaviourism theories) can assist in guiding the psychology of the behaviour modification process, from describing and assessing behaviour issues to developing, evaluating, and revising remedies. To build technological platforms that modify visitor behaviour, it is necessary



to first understand the functions of technology in tourist experiences, particularly mediation (Tussyadiah, 2017). Gupta et al. (2018) stated that increasing the amount of money invested in travel-related apps has made user acceptance and adoption crucial for successful implementation. Therefore, it is essential to examine the variables that influence the consumer acceptance and use of travel apps. Smartphone applications related to travelling will be more widely used if these factors are well understood. With recent advances in social media and mobile gadgets, less is known about the way various groups of the general traveller population use the Internet for booking trips (Kim et al., 2015). However, with intelligent travel, a variety of human-computer interaction concerns have emerged, such as assistance with decisions in the context of tourist information processing (Yoo et al., 2017).

The fundamental mechanisms influencing smartphone usage and traveller experience are not widely recognised. It is critical to comprehend the connections between smartphones in behaviours affect the tourist experience is the aim of this study (Wang et al., 2016). The development of mobile technology enables the collection of immediate details regarding tourists, including their location and time-of-day preferences, while travelling to a site. This study explores a large-scale phone dataset containing the smartphone footprints of international tourists visiting South Korea during their stay (Park et al., 2020). To ensure the success of contextualised proactive suggestions in influencing travel behaviour, it is vital to understand the factors that determine travellers' propensity to embrace touch options on mobile devices (Tussyadiah & Wang, 2016). Growing Internet usage has led to virtual exchanges between travellers, travel experiences, and service providers. Owing to features such as social networking and holiday review websites, the Internet is becoming an essential platform for both communication and information exchange. This significantly influences travel intention, location perception, and product selection in the tourism industry (Tseng et al., 2015). Social media influence travellers' vacation behaviours and experiences. This study outlines a framework describing the connections between social networking sites and travel behaviour. The influence of social networking sites on how travellers express their thoughts and feelings after a trip was then examined using this paradigm (J. Kim & Fesenmaier, 2017).

A contemporary trend in tourist studies involves the use of cutting-edge technology in marketing strategies such as virtual reality, smartphone applications, and digital media. Among these, virtual reality is the most innovative. TRVLR was launched by Discovery Travel in 2016 and covers all seven continents. Previously, certain tourist locations offered virtual reality information regarding their respective locations. These facilities introduce potential travellers to tourist destinations by engaging them in an intense, 360-degree narrative experience (Lin et al., 2020). During the Fourth Industrial Revolution, virtual reality (VR) became a developing field, along with the rapid development of digital technology. Individual travellers could organise and manage their vacations with increased ease owing to tourism organisations and platforms powered by technological innovation. Research on destinations for smart tourism has been restricted because most previous studies have focused on characterising smart tourism technology, despite their widespread use to enhance visitor experiences at such locations (Jeong & Shin, 2020).

In particular, VR gives travellers the opportunity to experience a place ahead of time, which is an invaluable promotional tool for travel agencies. Specifically, virtual reality tourism allows prospective travellers to visit the location shown in VR. VR is an emerging tool in the tourism industry; however, few studies have been conducted on the elements that influence travellers' decisions to visit virtually presented places (Kim et al., 2020). This study aims to analyse clients' behavioural expectations and the actual use of bots driven by computational intelligence for hospitality and tourism enterprises across India by broadening the implementation of the technological paradigm with context-dependent factors (Pillai & Sivathanu, 2020). A better understanding of VR's role in tourism constitutes a significant addition to information and communications studies and tourism management and marketing, considering the substantial customer base for VR tourism and its knowledge-management requirements (Kim & Hall, 2019). The term "digital travel" has become increasingly popular throughout all stages of a traveller's journey. This study attempted to answer the key question of how digital technologies affect travel behaviour and satisfaction, thereby affecting overall happiness. Previous research has not examined how smart tourism technologies affect trip behaviour and overall life satisfaction (Lee et al., 2018). Few relationships have been studied more extensively in the past ten years compared to the precursors of users' technology acceptance, which are based on the consumer behaviour literature. According to previous research, trust, hedonic incentives, societal impact, ambiguity, and accomplishment anticipation are important factors in individuals' acceptance and utilisation of new technology (Ribeiro et al., 2022). This study presents a theoretical understanding and empirical examination of the mediating function of destination representation in the connection between tourists' behavioural intentions towards a destination, featuring the case of a music festival in Morocco (Debbagh & Azouaoui, 2022). The rapid growth of innovative tourism technologies has opened up new opportunities for growth in tourism. More tourism locations rely on innovative technology to attract travellers and improve their travel experiences. The primary purpose of this review was to establish whether tourists were pleased with their new technological travel experience in terms of accuracy, convenience, interactive elements, customisation, and protection (Pai et al., 2020).

Major players in the travel and hospitality business include tourism demand, companies that operate tourist attractions, and those that formulate policies. They have already experienced the stages of response, rest, recuperation, and rearranging tourism recovery techniques (Li et al., 2022). This study examined the influence of technology on the tourism-urban risk connection in South Africa. The study discovered that the active role of technology in tourism did not lower urban risk in Africa but rather had a positive influence and marginally increased urbanisation risk in the country. The study also indicated that the currency rate, conditions for trade, and economic expansion all contributed positively and considerably to urbanisation vulnerability in South Africa owing to urbanisation (Tshidzumba & Oladunjoye, 2022). Given that a variety of innovations can be employed to achieve travel satisfaction, this study creates an instrument for assessing travellers' opinions on airport



innovations and investigates the relationship between these innovations and travellers' trust, happiness, and fulfilment (Bogicevic et al., 2017). Travel behaviours associated with intelligent tourism in developing competent areas were analysed (Syifaa Novianti & Wahyu Rafdinal, 2022). An enlarged model of the psychological notion of planned conduct was proposed as a tool for forecasting the relationship between the employment of smart tourism technologies and people's behaviour while selecting and visiting a destination. Innovative tourism technology has an immediate effect on visitors' views, personal standards, and perceptions of behavioural regulation, ultimately impacting travel decisions. Furthermore, their intended behaviour serves as a bridge connecting intelligent tourism technologies and visitor choice-making in picking and travelling to locations. Understanding the travel behaviour indicators for smart tourism enables planners to adapt to and execute enhanced smart tourism strategies for development. This literature review aims to provide significant insights into the impact of technology on travel behaviour in the tourism industry.

Methodology

This review used bibliographic analysis to explore the literature on technology and travel behaviour in tourism from the Scopus core collection. Scopus connects articles and researchers to multidisciplinary databases via reference and managerial indices, allowing for extensive bibliographies, rankings, and investigator links compared with other databases. This study was based on a bibliometric examination of secondary data accessible in the Scopus database for selected keywords. The researchers primarily used a combination of methodologies to perform a thorough review of relevant literature on the terms, 'technology', AND 'tourism', AND 'travel', AND 'behaviour' highlighting a range of 546 documents were found on the SCOPUS database from 1990 till present. Finally, the documents retained after deduplication and merging, the acquired final dataset composed of 302 papers, including 225 papers retained from journal articles, 49 conference papers, 19 book chapters, and nine review papers which were limited to the English language, were selected.

The final publications have been selected to outline the bibliographic presentation of data focusing on selective keywords for the refined search limited to 'tourism' AND 'travel behaviour' AND 'tourist behaviour' AND 'social media' AND 'tourism developments' AND 'virtual reality' AND 'technology adoption' AND 'consumer behaviour' AND 'information technology' AND 'tourism industry' AND 'technology' AND 'consumption behaviour' AND 'travel' AND 'behavioural research' AND 'innovation' AND 'mobile phone' AND 'augmented reality' AND 'artificial intelligence' AND 'smartphone' AND 'smart tourism technology' AND 'mobile technology' AND 'ICT' AND 'information use' AND 'travel and tourism' AND 'tourist experience' AND 'human computer interaction' AND 'metaverse' AND 'travel satisfaction' AND 'digital tourism' AND 'blockchain' AND 'big data' AND 'social networking sites' AND 'tourism experience' AND 'psychology' AND 'perception'.

The VOSviewer (version 1.6.20) software was used to perform a bibliographic review of the influence of technology on travel behaviour. VOSviewer is an application that allows the mapping of networking data, and then displays and studies them. VOSviewer enables users to build networks of scientific papers, peer-reviewed journals, investigators, research organisations, countries, keywords, and concepts. The items in these systems can be connected via joint authorship, pairing, referencing, bibliographic connections, or co-citation links (Eck & Waltman, 2023). Along with the VOSviewer software, the Scopus analysis tool was used to yield results in graphical presentations of years, funding sponsors, affiliation, country wise divide of selected papers, percentage distribution among various subject areas such as 'social science', 'business management and accounting', 'computer science', 'environmental science', 'engineering', 'economics', 'mathematics', 'decision sciences', 'psychology', and multidisciplinary areas.

Analysis and findings

This section elaborates on the various trends studied using the Scopus data analysis tool and VOSviewer software, highlighting year-wise research, analyses based on document types, research areas, journals, and year-wise top citations in journals. In this section, we highlight the bibliometric collaborative analysis featuring co-authorship; analysis based on countries, organizations, institutions, citations, and keyword cluster analysis, including top journal citations with sources.

Year-wise research trends

This section outlines a graphical presentation of the year-wise documents available from 2014 to 2024. It can be observed that the highest number of articles, 48 studies, were published in 2022, followed by 47 studies in 2022 during the pandemic, and 43 studies in 2021. In 2023, only 39 documents were published, while 2019 provided 30 documents, followed by 22 papers in 2017, and 19 documents in 2015, all related to the selected keywords. In 2024, 18 documents went for final publication. 2008 observed the least number of publications with only eight documents, followed by 2018 and 2016 with 16 and 12 documents, respectively. The analysis indicates that fewer research was conducted on technology's influence on travel behaviour before 2015. However, the invention of the Internet provided people with opportunities to travel digitally, transforming and elevating the tourism business from 2017 onward. New digital technology has driven significant innovations in manufacturing and healthcare facilities in metropolitan areas and regions. Industry 4.0 marks the conclusion of persistent trends and encourages researchers, leaders, and citizens who believe they will prosper in this ever-changing and complicated world to view it through fresh perspectives and paradigms. Tourism is also extensively engaged in digital innovations, which are progressively being recognised as innovation in the tourism industry or Smart Tourism (Pencarelli, 2020).



Table 1- ‘Year-wise distribution of documents’

Year	Documents
2024	18
2023	39
2022	48
2021	43
2020	47
2019	30
2018	16
2017	22
2016	12
2015	19
2014	8

Analysis based on document types

The representation below highlights figure 1 by the percentage of the types of documents studied for this review, featuring articles, conference papers, book chapters, and reviews. A total of 225 articles constituted the majority (75.8 %), followed by 49 conference papers (15.9 %), 19 book chapters (6.0 %), and 9 review papers (2.3 %). Other similar types of documents, such as books, letters, and preprints, were excluded.

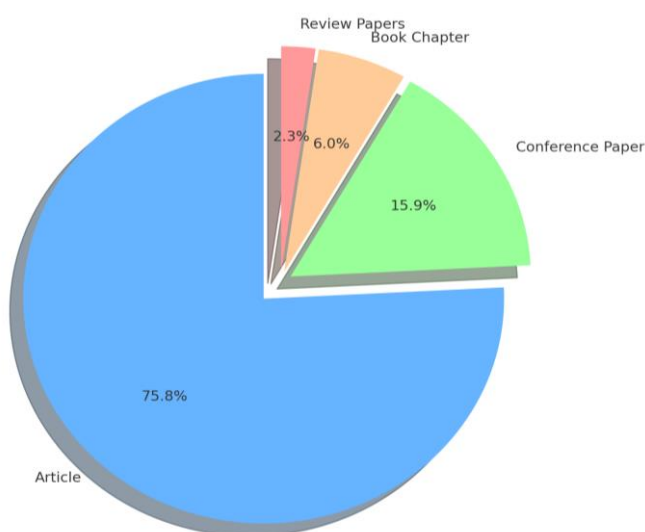


Figure 1-Percentage representation of Document "type"

Research area analysis

Table 2 outlines the percentage distribution of documents under the following subject areas namely: social sciences’, business, ‘management and accounting’, computer science’, environmental science’, engineering’, energy’, economics ‘, econometrics and finance’, mathematics’, decision sciences’, earth and planetary sciences’, psychology’, medicine’, agricultural and biological sciences’, physics and astronomy’, multidisciplinary’, health professionals science’, materials science’, nursing’, neuroscience’, and arts and humanities. It highlights the top five areas in terms of percentage distribution of documents, with ‘social science’ ranked first at 26.3%, followed by ‘business, management and accounting’ at 25.5%. ‘Computer science’ ranked third with 14.4%, while ‘environmental science’ and ‘engineering’ ranked fourth and fifth, with distributions of 8.5% and 5.4%, respectively.

Table 2 – Main areas of research and percentage distribution

Ranking	Subject Area	Percentage Distribution
1	Social Sciences	26.3%
2	Business, Management, and Accounting	25.5%
3	Computer Science	14.4%
4	Environmental Science	8.5%
5	Engineering	5.4%

Journal analysis

The 302 papers assessed appeared in 128 journals. Table 2 highlights the top five subject fields that have made significant contributions to the study regarding the impact of technology on travel behaviour studies related to tourism. The top five journals accounted for 25.82% of the papers published in this academic subject. Research on travel behaviour in tourism are primarily published in top-ranked journals with a focus on specific topics. This conclusion can help researchers select appropriate publications for future research. The citations for the top 5 journals between 2014 and 2024 are also listed in Table 4.



Table 3 – Top 5 Journals from 2014-2024

Source	Documents
Sustainability Switzerland	24
Tourism Management	17
Current Issues in Tourism	13
Asia Pacific Journal of Tourism Research	12
Journal of Travel Research	12

Table 4 - Top 5 Journal source citations by year

Source	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Tourism Management	13062	14710	18620	21581	25238	31948	37938	41193	44592	47622	14805
Sustainability (Switzerland)	1815	3573	6060	10879	23237	43111	80471	143556	217637	290522	90717
Current Issues in Tourism	1400	1621	2224	2758	3562	4861	7026	9746	13359	16239	5053
Asia Pacific Journal of Tourism Research	515	747	906	1060	1448	1896	2734	3498	4419	5007	1568
Journal of Travel Research	5631	6236	7715	8323	9586	11371	13166	14779	16664	18801	6051

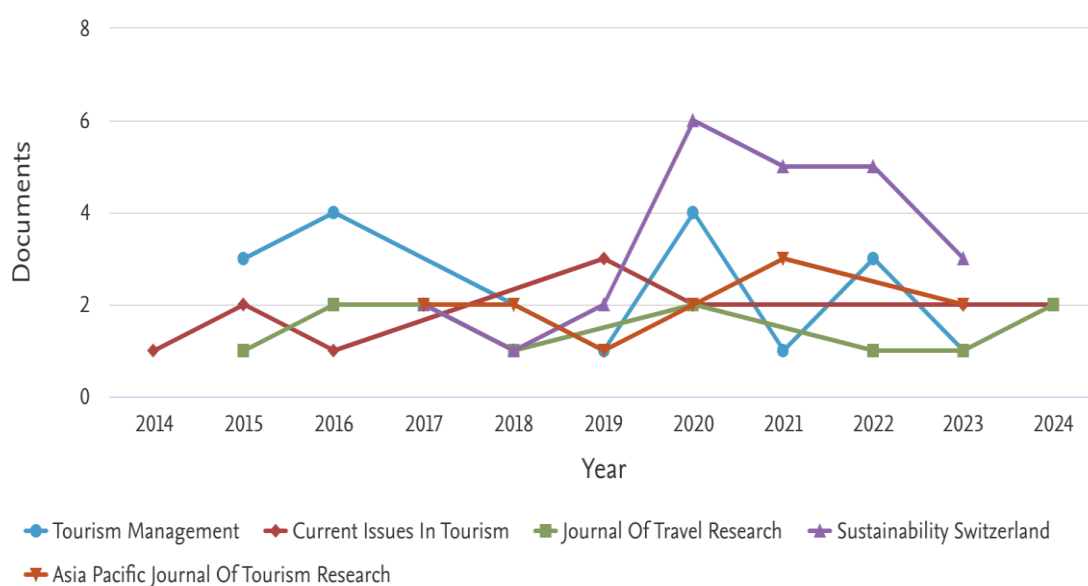


Figure 2 – Year-wise progression of Top 5 journals from 2014-2024

Bibliometric collaborative analysis

This analysis included the following distribution based on co-authorship, co-occurrence, citation, bibliographic coupling, author, organization, countries, all keywords, author keywords, and indexed keywords. Citations were based on source, author, organization, and country Co-citations were based on cited references, sources, and authors.

Co-authorship analysis based on countries

Figure 3 outlines a total of 160 primary authors who wrote 302 articles and analysed notable authors according to publication counts as well as collaborative networks. The study outlines the top five authors with the most publications: Xiang, Dickinson, J. Festival, E. Fesenmaier, Wang, and Filimonau. Xiang, Z.'s documents in this field rank among the top, with as many as 1059 citations, indicating a significant contribution to the literature. Among these authors, a close cooperative connection was discovered, compared to the others. The literature review found that 161 institutions researched technologies that influence travel behaviour in tourism. The Hong Kong Polytechnic University excels in several research fields, including computer science, engineering, and materials science. Furthermore, the university successfully conducted research on tourism technologies. This institution has published the most articles in this field and has a 12-year half-life, indicating its long-term impact. A sudden rise in value indicates an emergency at the organisation during the evaluation period (Chen et al., 2020). Other affiliated studies were conducted at 'Kyung Hee University', 'University of Johannesburg', 'Virginia Polytechnic Institute and State University', 'University of Surrey', 'Sun Yat-Sen University', 'Bournemouth University', 'Zhejiang University', 'University of Florida', and 'Monash University'.

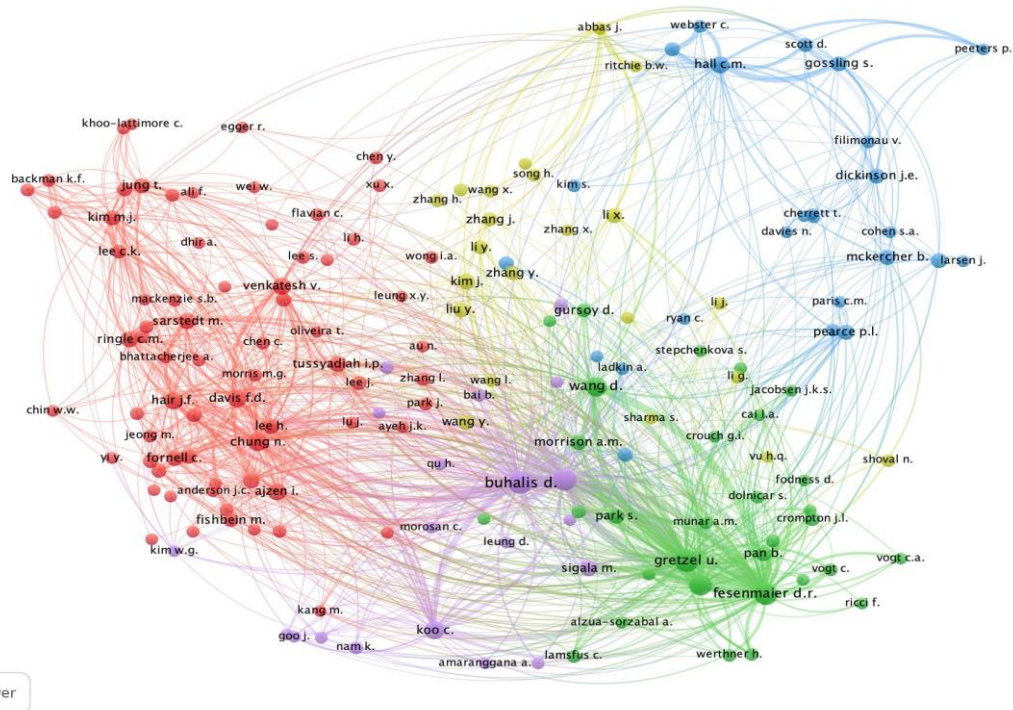


Figure 3- Co-authorship analysis highlighting authors

Table 5 Outlines Documents by affiliation organization/institution

Affiliation	Documents
The Hong Kong Polytechnic University	13
Kyung Hee University	9
University of Johannesburg	6
Virginia Polytechnic Institute and State University	6
University of Surrey	5
Sun Yat-Sen University	5
Bournemouth University	5
Zhejiang University	4
University of Florida	4

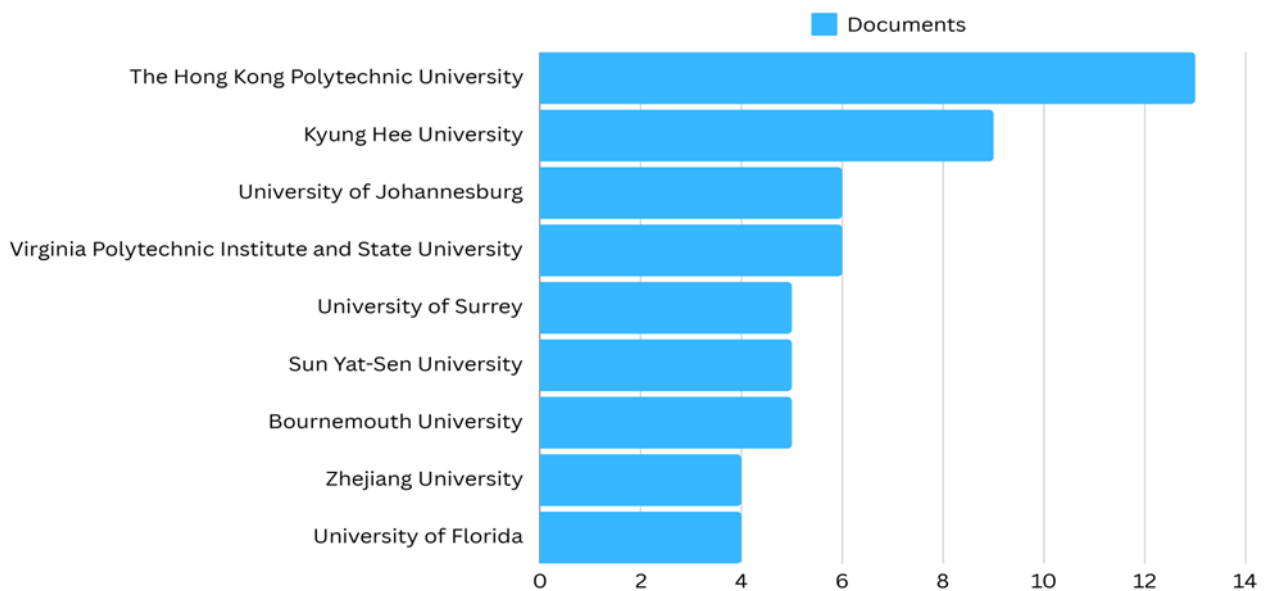


Figure 4 – Outlines Documents by affiliation organization/institution

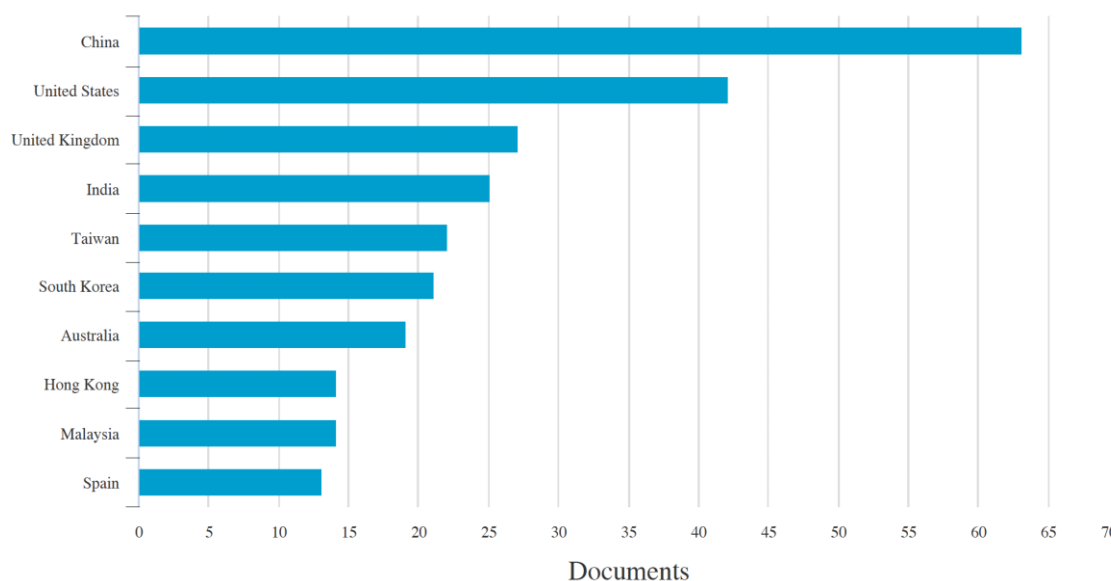


Figure 5 - Top ten countries with the greatest number of studies.

Over the past decade, 68 countries have conducted studies on the interface between technology and travel behaviour to better comprehend travel experiences and satisfaction related to the tourism business. The top ten countries are highlighted in Figure 5. The top five countries consist of China dominated the graphical representation with 65 studies, followed by the United States with 41 studies, the United Kingdom with 27 studies, India and Taiwan with 23 studies, and South Korea with 21 studies stood 5th in the row. These countries provide valuable insights into future possibilities for conducting regional studies based on technology and travel behaviour.

Analysis of popular keywords and research topics

Cluster analysis identified a total of 1989 connected keywords. Figure 6 outlines the top set of keywords, grouped into three clusters. Cluster 1 includes ‘tourism behaviour’, ‘tourist behaviour’, ‘destination’, ‘social media’, ‘technology acceptance model’, ‘tourism’, ‘tourism industry’, and ‘virtual reality’. This is connected to Cluster 2, which features ‘big data’, ‘ICT’, ‘smart tourism’, ‘tourism management’, ‘tourism market’, ‘tourist destination’, and ‘travel behaviour’. The interconnection between the two clusters includes keywords, such as ‘China’, ‘perception’, ‘technology adoption’, ‘tourism development’, and ‘tourist behaviour’, and ‘internet’. Clusters showcases the interconnectedness representing the most popular topics for review, as shown in Figure 7.

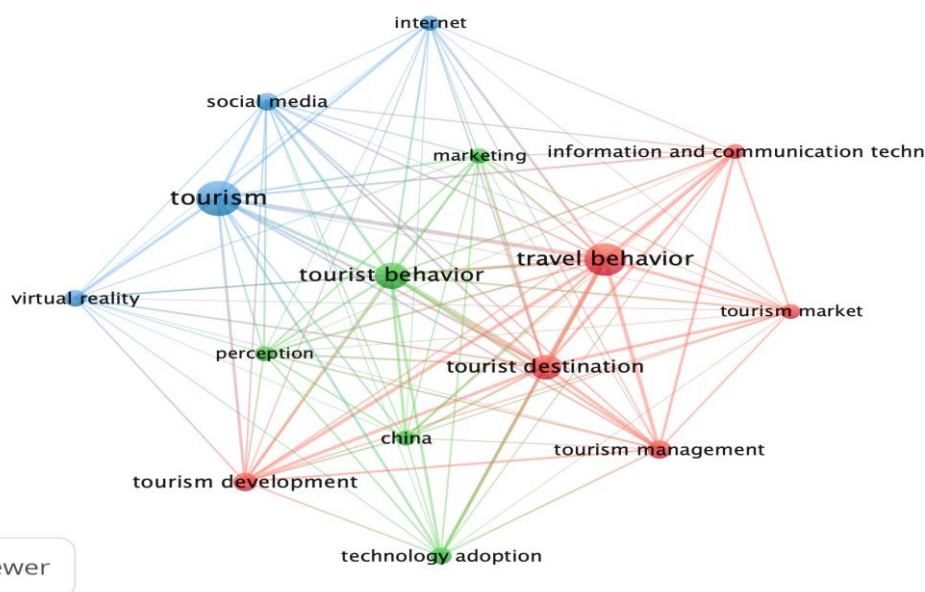


Figure 6 - Cluster analysis of top keywords

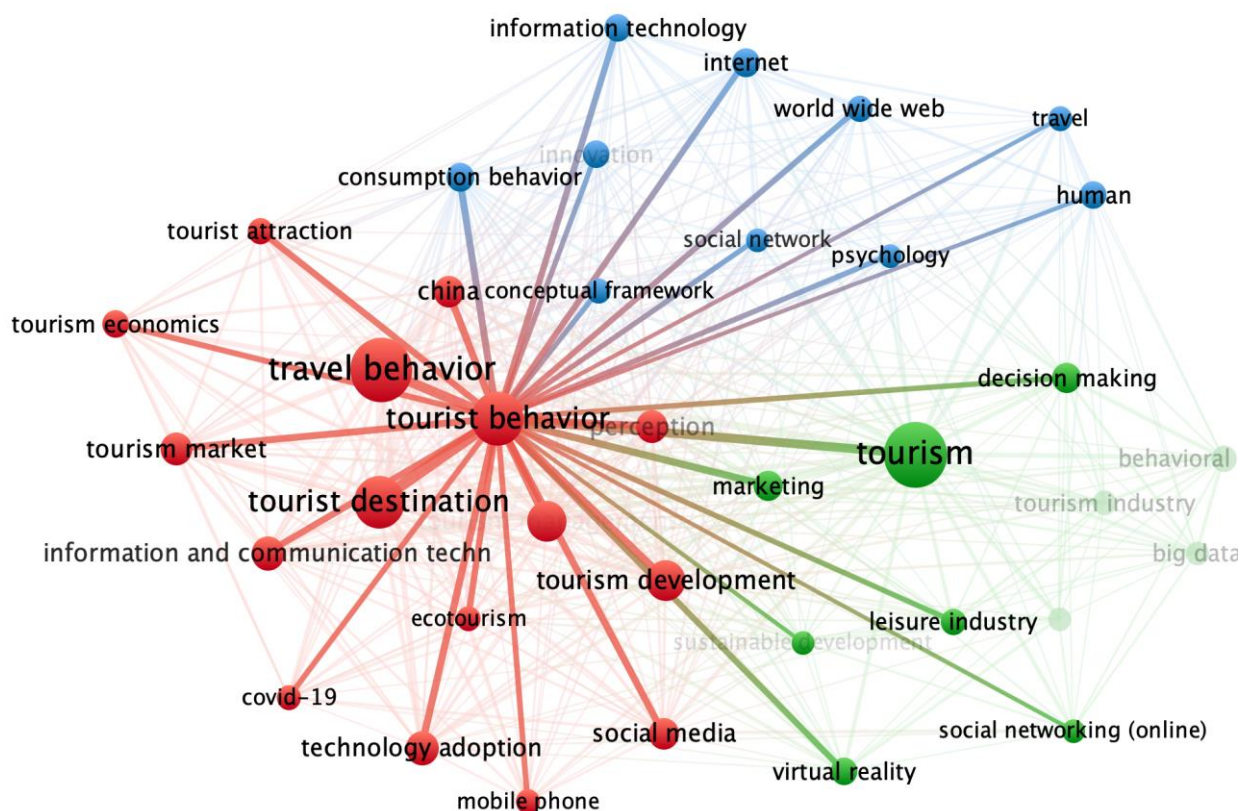


Figure 7 - Outlining Cluster with prominent keyword connections

Co-citation Analysis – includes number of top cited studies, journals, keywords, articles

Co-citation analysis is a critical component of bibliometric analysis. This methodology can accurately assess the understanding foundation of a study topic by analysing the frequency of co-cited papers and identifying the most significant ideas and educational institutions of thinking. A total of 302 references cited 16708 references, and keywords were extracted to generate a co-citation map of the available literature on the influence of technology on travel behaviour in tourism. The citation cluster is derived from VOSviewer, highlighting co-citation for cited authors. A minimum of 20 citations per author was set as the threshold, resulting in 170 authors out of 22256 meeting the criteria. The total link strength was calculated, and the author with the greatest total link strength was selected. Some authors were not connected within the five formed clusters. The co-citation analysis reviewed that the authors: Buhalis, Gretzel, Rob Law, Fesenmaier, Wang and Xiang were highly connected as shown in Figure 8. The top ten studies with the highest number of citations along with the year, type of document, journal, affiliation institution, and publisher are listed in Table 6.

Table 6 – Top 10 studies and Citations, document type, journals and Publishers

Rank	Authors	Year	Citations	Document Type	Journal	Publisher
1	(M. J. Kim et al., 2020)	2020	580	Article	Journal of Travel Research	SAGE Publications Ltd
2	(Cohen et al., 2014)	2014	443	Review	Current Issues in Tourism	Routledge
3	(Xiang et al., 2015a)	2015	436	Article	Journal of Retailing and Consumer Services	Elsevier Ltd
4	(Amaro & Duarte, 2015)	2015	390	Article	Tourism Management	Elsevier Ltd
5	(D. Wang et al., 2016)	2016	362	Article	Journal of Travel Research	SAGE Publications Ltd
6	(Chung & Koo, 2015)	2015	299	Conference paper	Telematics and Informatics	Elsevier Ltd
7	(M. J. Kim & Hall, 2019)	2019	247	Article	International Journal of Information Management	Elsevier Ltd
8	(Tseng et al., 2015)	2015	223	Article	Tourism Management	Elsevier Ltd
9	(J. Kim & Fesenmaier, 2017)	2017	188	Article	Journal of Travel Research	SAGE Publications Ltd

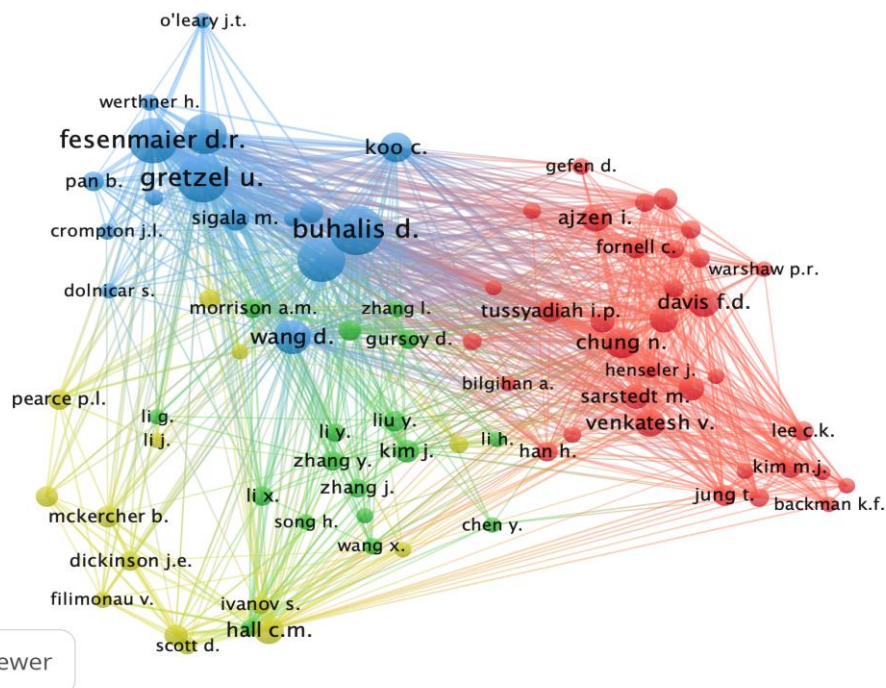


Figure 8- Connection between top authors.

Outcomes and future directions

Publication references and co-referencing studies, such as collaboration networks and author co-citations, are valuable resources for future researchers investigating the influence of technology on travel behaviour. This study identifies the most influential journals in the field based on citation and co-citation data. The readily accessible nature of the Internet and location have a significant influence on how travellers seek information and make travel plans, owing to the growing popularity of mobile phones (Xiang et al., 2015b). The tourist industry was one of the most affected by the pandemic, with major effects on the number of cancelled bookings, drops in international travel, and changes in consumer habits. The main conclusions indicate that people's reliance on the Internet to seek information has become more popular than discussing it with family and close friends. There is likely to be a significant increase in digitisation with online platforms transforming physical travel agencies, except for those focused on advisory services (Toubes et al., 2021). The results indicate that travel planning is significantly affected by the proliferation of social networks and other emerging online communication channels. Planning websites have been increasingly using social networks and photo or video-uploading sites. This study provides a relevant review of the application of information technology for travel planning as well as helpful information for developing communication plans for locations and travel enterprises (Kim et al., 2015). For decades, various studies have focused on the increasing appeal of cultural tourist destinations. This study provides a deep understanding of tourists' behavioural intentions to return to these destinations. This also necessitates an investigation of the factors that influence tourists' motivations to return. The author outlined network analysis results featuring the antecedents of behavioural determination to revisit, such as tourist destination image, satisfaction, memorable experience, motivation, and perceived authenticity (Gaonkar & Sukthakar, 2024).

Mobile technology advancements can lead to new applications and research content in tourism (Chen et al., 2020). Examining the materials and comments left by other travellers has emerged as one of the most crucial online activities, especially when booking a trip online. The findings indicated that being drawn to the virtual environment has increased travellers' intentions to visit locations included in virtual tourism. The willingness to visit a site in virtual reality was highly strongly influenced by cognitive responses than by affective responses (Kim et al., 2020).

Buhalis et al. (2023) highlighted that the next big development in technology that would have a massive impact on the community over the coming decades is called a metaverse. A metaverse enables immersive experiences in both the real-world and digital realms. The metaverse is projected to transform tourism administration and advertising. It uses digital twins to improve destination awareness, positioning, and promotion, in addition to coordination and management. Metaverse offers opportunities for trip planning, interaction, and participation, thus influencing customer behaviour. Virtual visits and interactions with destinations are projected to encourage, rather than replace, real-world travel. The results demonstrated that the lodging establishment's social network had stronger advertising efficiency, and that visual attention evaluations derived from eye-tracking data differed from self-reported metrics. The visual response to the advertisement banner was associated with an insufficient degree of awareness, which explains why connections with the advertisement did not result in subsequent recollections (Muñoz-Leiva et al., 2019). This study uses an integrated framework based on the Unified Theory of Acceptance and Use of Technology (UTAUT) to investigate tour operators' perceptions of digital marketing usage and the factors influencing their adoption or rejection of it. The identified factors influence the use of technology. These characteristics are



modified by behavioural intentions. These findings indicate that tour operators' conducive conditions and behavioural intentions have a direct impact on user behaviour. However, perceived ease of use, personal innovativeness, and favourable conditions also directly influence behavioural intention. Personal innovativeness influences usage behaviour, mediated by behavioural intentions (Yusrini et al., 2024). This study aims to contribute to the growing corpus of research on the psychological components of domestic travel by examining the influence of personal values and time direction on travel intentions. The data analysis results demonstrate that openness-to-change and self-enhancement values significantly positively affect travel intention, while conservatism and self-transcendence values have no influence. Furthermore, the importance of polychronicity is highlighted (Essien et al., 2023). This research indicates that when 6G mobile phone technology becomes available by approximately 2030, wireless communications in tourism will experience tremendous growth (Chen et al., 2020). This underscores the importance of using technology in the hospitality industry to become more resilient in the face of outbreaks. Lessons from the current pandemic, as well as from this study, can help businesses adapt to external demands by incorporating new technologies and developing long-term survival strategies. The data also suggest that employees accept technological breakthroughs and are willing to use them (Tiso & Melani, 2023).

Prominent authors, institutions, and countries in the field of research, as well as their partnerships, are identified through author–collaborator networking assessment, referencing evaluations, institutional connection studies, and country-wise cooperation analyses. In this study, the United States, Hong Kong Polytechnic University, and Wang were the top nations, institutions, and authors, respectively. To gain insight into travel behaviour and the influence of technology research on tourism, academics and industry professionals can consult literature from the abovementioned journals, authors, institutes, and nations. Technological advances have united all stakeholders in tourism-related environments. Intelligent environments are bound to revolutionise business structures, procedures, and methods, resulting in disruptive impacts on innovation in services, planning, leadership, advertising, and challenges for all parties concerned. To gain a competitive advantage, future research should focus on the following areas: AI, motion processing, human-computer interfaces, corporate dynamism, neuroscience-based marketing, and collective agility (Buhalis, 2020). Future studies could focus on primary data evaluation by conducting techniques such as questionnaires, personal interviews, and surveys of different sets of results.

Conclusion

This investigation uses bibliographic evaluation and visual representation to determine emerging research domains, top publications, contributors, organisations, nations, study subjects, and information bases. Travellers now use personal devices as essential tools for everything ranging from the first phases of organising and planning journeys to real-world travel experiences. Smartphones and gadgets allow people to easily obtain information on flights, accommodations, activities, and transit alternatives. The convenience of accessibility and the capacity to make sound choices have transformed travel, allowing passengers to use several forms of transport on a single route. This study emphasises the importance of considering context while implementing and employing information technology in the travel and tourist sectors. Over the past decade, numerous studies have used the technology acceptance model (TAM) to examine travellers' opinions, beliefs, and behaviours towards using the Internet or specific tools for trip shopping or information search (Lamsfus et al., 2015). Metaverse offers possibilities for organising a trip, connection, and involvement, thus influencing traveller behaviour. Virtual visits and interactions with destinations are projected to encourage, rather than replace, real-world travel (Buhalis et al., 2023).

Highlighting these limitations, the current review is based on secondary data available from the collection of keywords. If additional keywords are included, the study will provide different outcomes, and the investigation will also provide alternative types of statistical analysis. Certain limitations are also highlighted in the body of knowledge regarding the overuse of technology, which is connected to addiction and behavioural disorders. This issue has extended into the tourism industry. Recent literature additionally contends that excessive use of technological devices while travelling could have an adverse effect on the whole travel experience, and hence, some tourists might desire "disconnection" while travelling. The clustering results were aligned with the study areas, portrayed by terms with high combination probabilities. Therefore, this study emphasises the relatively new and minimally understood phenomena of "digital free tourism" by researching respondents' intentions to deliberately refrain from or restrict their use of technology while travelling (Egger et al., 2020). Blockchain technology can alter the tourism industry by providing new solutions to urgent concerns. However, the current knowledge of blockchain applications in tourism is limited, with past research being scattered and confined in scope and applicability (Chen et al., 2020).

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