

Mapping the transformative impact of technology on experiential tourism: a systematic literature review

Meghna Chhabra, Bindu Roy, Yuvika Gupta, Anuj Kumar and Millo Yaja

Abstract

Purpose – This study conducted a detailed systematic review of experiential tourism literature, specifically focusing on smart tourism technologies. It explores how these technologies not only transform the overall tourist experience but also contribute to tourism development. In this study, we aimed to identify evolving research areas and past trends, and propose new topics for future investigation.

Design/methodology/approach – A mixed approach is used in this study. It employs a systematic literature review, utilizing bibliometric (quantitative) and content analysis (qualitative) methods to examine the existing literature on experiential tourism with a focus on smart tourism technologies. This review synthesizes the findings related to the integration of technology in tourism and its implications.

Findings – This study reveals that smart tourism technologies significantly enhance experiential tourism by aligning with customer relationship management practices and fostering sustainable tourism development. These findings underscore the importance of technology in creating personalized and meaningful tourist experiences. As technology continues to advance, its impact on travel and tourist behavior is expected to grow significantly in the future. Therefore, tourism stakeholders must be proactive in adopting new technologies and focusing on developing human-centric innovations to ensure positive outcomes.

Originality/value – This study fills a critical gap in the literature by systematically exploring the intersection of smart tourism technologies and experiential tourism. Based on the findings of the cluster analysis, we also propose a conceptual framework for tourism stakeholders to understand the integration of technology-enabled tourism products and services to enhance the tourist experience. The noteworthy finding of our study reveals that the relationship between smart technologies and the tourist experience is twofold. On the one hand, the integration of technology into tourism, with features such as accessibility, interactivity, informativeness, personalization, and security, has been shown to create unique and memorable experiences for travelers. Smart tourism technology, which enhances the overall tourist experience, has emerged as a significant driver of tourism development, contributing to destination competitiveness.

Keywords Experiential tourism, Technology adoption, Sustainable tourism, Customer relationship management, Virtual experiences

Paper type Literature review

(Information about the authors can be found at the end of this article.)

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1. Introduction

Tourism, the act of traveling for pleasure or business, has long been a fundamental aspect of human culture and global economy. For generations, people have embarked on journeys to explore and enjoy new places, experience different cultures, and craft enduring memories (Holbrook, 2000). However, owing to advancements in digital technology, tourism has undergone a profound transformation in recent decades (Kim and So, 2022). It is no longer limited to simply visiting new destinations; it has evolved into a more immersive and participatory form, known as experiential tourism. Experiential tourism emphasizes active engagement with local cultures, food, and immersive experiences, and develops meaningful connections with destinations (Adhikari and Bhattacharya, 2016).

As travelers seek deeper connections with the places they visit, technology plays a pivotal role in facilitating and enhancing their experiences (Buhalis and Amaranggana, 2015; Cobanoglu *et al.*, 2011; Lee *et al.*, 2017). Technology has shifted from being a subsidiary tool to a necessity in various domains, including civil infrastructure, education services, business, healthcare, entertainment, transportation, and social interactions (Bilgihan *et al.*, 2010; Shen *et al.*, 2020). The tourism industry is not exempt from the pervasive adoption of smart technologies as they have significantly impacted the way we experience travel (Hall *et al.*, 2000; Huang *et al.*, 2017; Kabadayi *et al.*, 2019). Smart tourism technologies (STTs) encompass a wide array of innovations, including Artificial Intelligence (AI), Virtual Reality (VR), the Internet of Things (IoT), Radio Frequency Identification Devices (RFID), Cloud Computing, Mobile Payment, Mobile communication, Social Networking Websites, Smart devices, and tourism-related platforms (Gretzel *et al.*, 2015; Huang *et al.*, 2017).

Research has shown that the integration of smart tourism technologies enriches tourist experiences and revolutionizes the way tourists engage in destinations that align with their preferences (Au and Tsang, 2024; Buhalis and Amaranggana, 2015; Chen *et al.*, 2021; Jeong and Shin, 2020; Magnus and Daniel, 2014). They desire to create memories that resonate with their values and passions. This shift towards personalization has been facilitated by technology, which enables travelers to plan and design their itineraries, access real-time information, and connect with local experts and enthusiasts (Azis *et al.*, 2020; Neuhofer *et al.*, 2015; Rasoolimanesh *et al.*, 2019). The fusion of experiential tourism and technology has resulted in a symbiotic relationship that reshapes the tourism landscape.

The transformative impact of technology on the tourism industry is evident in the compelling growth statistics. In 2020, most travel bookings and reservations were conducted through digital platforms, which marked a significant shift in the industrial landscape. The worldwide online travel market reached \$433.2 billion in 2021, and it's expected to reach \$690.71 billion by 2026. It is estimated that more than 700 million people will book online by 2023 (Statista Research Department, 2023). This rapid digital adoption reflects the increasing demand for convenience, personalization, and real-time interaction. Additionally, the contribution of Artificial Intelligence (AI) to the global revenue share of travel companies has seen remarkable growth, rising from 9% in 2018 to 21% in 2021, with a projected increase of 32% by 2024 (Statista Research Department, 2023). These trends highlight the growing reliance on intelligent systems for service personalization, predictive analytics, and customer engagement.

The pervasive use of mobile devices to browse travel websites, make payments, and share travel experiences further underlines the integration of technology into travellers' journeys. Instagram, with one billion active monthly users in 2021, has become a powerhouse for sharing travel experiences (Dixon, 2023). It plays a critical role in shaping travel decisions and fostering peer-driven experience sharing, which is an important dimension of experiential value co-creation. Moreover, the global Augmented Reality (AR) and VR markets exhibit a substantial estimated value of \$1.9 billion by 2020, with projections anticipating that the VR segment will reach approximately 8.9 billion U.S. dollars by 2023 (Statista Research Department, 2023). These technologies enable travelers to simulate their experiences at pre-visit, enhancing emotional engagement and decision-making confidence. The contribution of AI to the global revenue share of travel companies has seen remarkable growth, rising from 9% in 2018 to 21% in 2021, with a projected increase of 32% by 2024 (Statista Research Department, 2023). This multifaceted integration of technology underscores its pivotal role in shaping the trajectory of the tourism industry.

The existing literature has primarily focused on the overall influence of advanced tourism technologies on tourist satisfaction, loyalty, and tourist experience (Azis *et al.*, 2020; Zhang *et al.*, 2022). In their review of the progress of information and communication technology (ICT) in hospitality and tourism, Law *et al.* (2014) deciphered the use of ICT in different functional units for different applications. Some studies explain the positive impact of various technologies on the growth of the tourism industry and their increasing role in creating tourist visits, particularly after

the COVID-19 pandemic (Mastroberardino *et al.*, 2021; Roy *et al.*, 2023). The literature has highlighted the importance of technology when tourists prefer less human touch (Bhatia *et al.*, 2022). Virtual experiences have become widespread in various domains including entertainment, education, healthcare, and business. Progress in technology, specifically in VR and AR, has played a substantial role in this phenomenon. Travel experiences can be provided through AR, VR, or other smart technologies. However, tourists still prefer physical travel to virtual travel, leading to lower adoption of these technological tools. Technology can help obtain a travel experience, but it cannot replace the significance of human touch. Therefore, managers and entrepreneurs must promote tourism technologies to recognize the significance of human contacts/connections. Because human contact contributes significantly to transforming a travel experience from ordinary to memorable, they cannot ignore human resources or human contact in this field because they may convert their travel experience into a memorable one. There is a significant research gap in the systematic literature on the specific and comprehensive role of smart technologies in facilitating experiential tourism.

This study aims to examine this gap by conducting a detailed systematic review of experiential tourism literature with a specific focus on smart tourism technologies. In this study, we aimed to identify evolving research areas and past trends and propose new topics for future investigation (Chhabra *et al.*, 2023; Di Vaio *et al.*, 2022). The key questions addressed in this study are as follows:

- RQ1. What are the quantitative and qualitative analysis maps of the literature for experiential tourism and technology?
- RQ2. What are the current and past research trends in the selected field of experiential tourism and technology?

The insights gleaned from our research promise to be invaluable to tourism stakeholders and marketers, enabling them to devise effective strategies and plans to offer tourists memorable experiences.

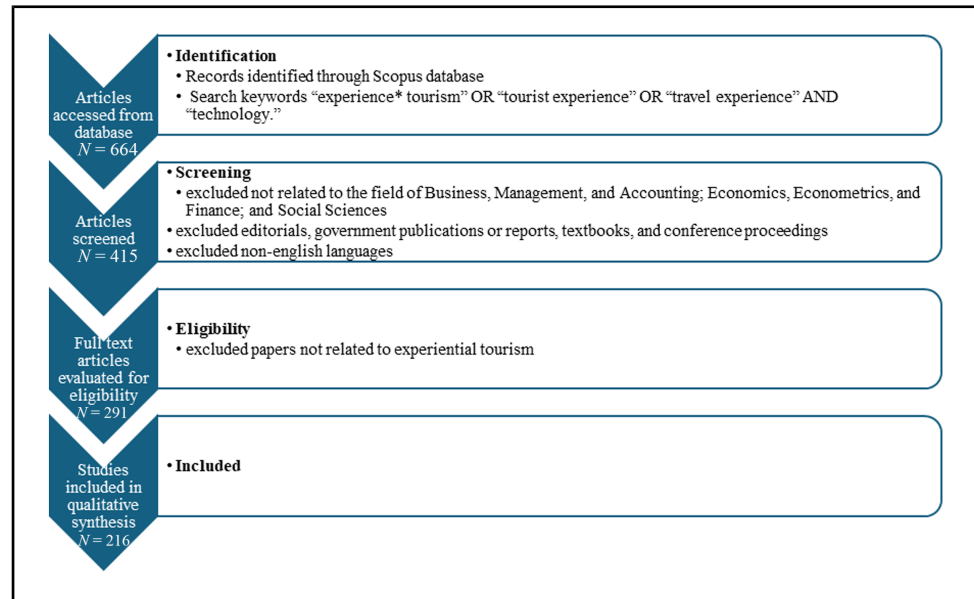
A systematic literature review (SLR) is a comprehensive methodology that identifies, analyzes, and discusses the links between previous studies to highlight research gaps (Di Vaio *et al.*, 2024a). It also offers a new conceptual framework and future avenues by answering the research questions proposed in the literature (Tsiotsou and Boukis, 2022). Using the VOSviewer program version 1.6.5, the authors analyzed 216 articles published between 1990 and 2024 from the Scopus database and Google Scholar (GS) by following descriptive, bibliometric, and network analyses, and exporting the publication metadata to MS Excel 2019 (Van Eck and Waltman, 2014). This study offers a comprehensive picture of academic networks using bibliometric analysis, enabling researchers to determine “how” to place themselves within the research areas and map out the major evolutionary paths (Arici *et al.*, 2024; Damar and Koksalmis, 2024)

This study is divided into six sections. Sections 2 and 3 present the methodology and performance analysis based on bibliometric analysis, respectively. Section 4 discusses the results of content analysis. Section 5 presents the discussion and conclusion. Finally, Section 6 describes the future scope of the study.

2. Research methodology

This study uses a mixed approach of quantitative (bibliometric analysis) and qualitative (content analysis) methods to explore the integration and implications of smart tourism technologies in experiential tourism. This study outlines a methodology for developing evidence-based knowledge in experiential tourism and technology through systematic reviews. It advocates a structured approach that involves systematically formulating the problem, conducting thorough literature searches, using rigorous criteria for study selection (Figure 1), extracting and

Figure 1 Inclusion and exclusion criterion. Source: Authors' presentation



synthesizing relevant data, assessing the quality of studies, and translating the synthesized evidence into practical knowledge for the field (Gursoy *et al.*, 2024; Tranfield *et al.*, 2003). The primary objective of undertaking a systematic literature review is to examine the current body of literature on a specific topic, aiming to identify concepts and theories explored by other scholars in the existing literature (Goel *et al.*, 2024; Hassan *et al.*, 2022)

This study used a blend of bibliometric analysis methods, including citation analysis, keyword co-occurrence, and conceptual thematic mapping (clustering), along with the content analysis method, to investigate the research questions.

The Scopus database includes a large number of journals, and this study aimed to narrow its focus to top-tier publications, as these sources are likely to provide valuable insights regarding the evolution of the research domain. Thus, to ensure the incorporation of articles published in meticulously peer-reviewed and high-quality academic journals, this study was based on the Scopus database.

The authors searched for theoretical and empirical studies in the Scopus database using the following key search words "experience* tourism" OR "tourist experience" OR "travel experience" AND "technology." Additionally, we used the database topic, abstract, keywords, and title searchable fields in the literature search process. This approach allows us to capture a broader range of relevant studies in our analysis. To obtain a comprehensive perspective, our search was not restricted to specific journals or predefined journal rankings (Fahimnia *et al.*, 2015). The identification phase resulted in 664 references being published between 1992 and 2023.

During the screening phase, the authors excluded 249 research papers that were not related to the fields of "Business, Management, and Accounting"; "Economics, Econometrics, and Finance"; and "Social Sciences", leaving 415 papers. Further, the authors included only research articles and review papers and excluded other types of research works, such as editorials, government publications or reports, textbooks, and conference proceedings, which further reduced the number of research papers to 300. Articles written in non-English languages were excluded from the study, resulting in a total of 291 articles. After conducting a full-text-based manual evaluation of the remaining 291 articles to ensure alignment with our review objectives, we identified 75 articles that did not meet the criteria during the face validity check. Consequently, our

final dataset comprised 216 articles (please refer to Appendix 1 in the Supplementary Material for a complete list).

This study utilized the bibliometric method as the primary approach to offer a comprehensive review of experiential tourism (Linnenluecke *et al.*, 2020). By employing the bibliometric method, this study aims to minimize interpretation bias and provide objective and data-driven insights into experiential tourism (Di Vaio *et al.*, 2024b). The authors used the open-source VOSviewer 1.6.15 software package for bibliometric and network analysis, citation analysis, co-authorship analysis, and co-occurrence network analysis (Van Eck and Waltman, 2014). VOSviewer, a reliable and popular software for bibliometric analysis, utilizes “visualization of similarities” (VOS) to explain the relationship between entities and performs the core functions of VOS mapping and VOS clustering (Abdollahi *et al.*, 2023; Chhabra *et al.*, 2023). By leveraging VOSviewer tools and techniques, the authors revealed prevailing trends, patterns, and noteworthy contributors within the domain of experiential tourism.

This review focuses on aspects that define the relationship between experiential tourism and technology and provides a comprehensive overview of the current environment. This study aims to investigate and elucidate the novel prospects of the integration of technology in the tourism sector and explore how technological interventions such as AR, AI, mobile apps, and 5G connectivity contribute to new dimensions of innovation and transformation in the overall travel experience. The ultimate goal is to provide valuable insights for future research and shed light on the evolving dynamics of technology-infused travel experiences for tourism stakeholders, policymakers, and researchers.

A performance analysis was conducted to examine publication patterns, influential sources, prominent countries, impactful authors, and significant articles in experiential tourism. This entails analyzing the number of publications as indicators of productivity and their citations as an impact in the research area (Goel *et al.*, 2024). Further, co-authorship analysis based on countries and authors is performed to analyze the network of researchers in different countries as well as to identify researchers who have worked together in the area of study (Donthu *et al.*, 2021).

In qualitative analysis, co-word analysis was employed to identify themes, and clusters were formed by identifying keywords that frequently appeared together and had a thematic relationship with one another (Dana *et al.*, 2024). Co-word analysis is a technique that delves into the content of a publication. In the content analysis, word frequencies generated through VOSviewer were analyzed to identify themes by listing all unique words in the articles and noting their frequency of appearance. Identifying and analyzing the co-occurrence of words and their thematic relationships allowed authors to group related concepts and themes in the literature on experiential tourism, providing a more comprehensive understanding of the interconnected ideas within the field.

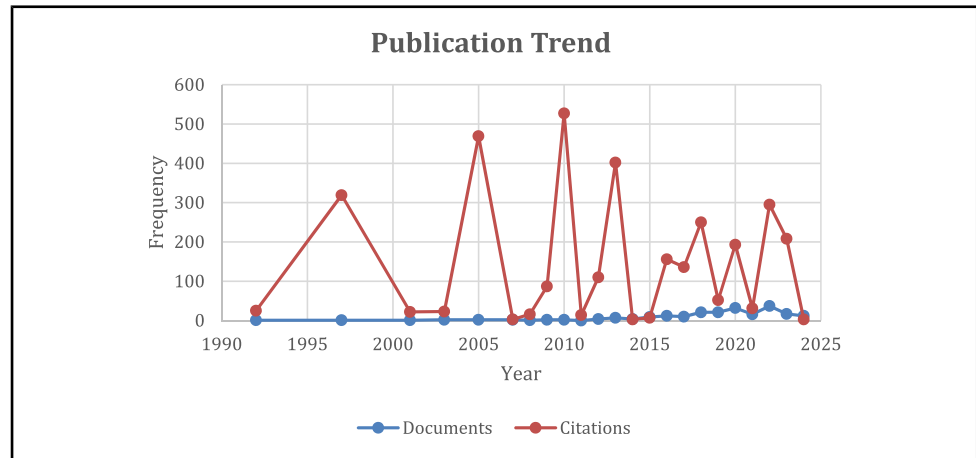
3. Performance analysis based on bibliometric analysis

In this section, we present the findings of the bibliometric analysis.

3.1 Publication and Citation Trends

As shown in Figure 2, considering the timing of publication, the sample papers covered the period 1992 to June 2023. Notably, the Figure shows a gradual increase in the topic's coverage in year 2016–2019. A significant increase in research interest was observed in 2020. A significant increase can be seen in the sudden and dramatic decline in tourism activity due to COVID-19, which has forced researchers to rethink their approaches towards tourism research and focus on new and emerging topics (Gretzel *et al.*, 2020; Ghaderi *et al.*, 2023). Studies have been conducted to understand the economic, social, and psychological effects of the pandemic on travelers, tourism businesses, and destinations. The pandemic has raised new research

Figure 2 Publication and citation trend. Source: Authors' presentation using MS Excel



questions and areas of inquiry within tourism research, such as traveler behavior during pandemics (Ghaderi *et al.*, 2023). Consequently, it is reasonable to anticipate that the number of papers and their associated citations will continue to increase by 2023.

3.2 Most popular Source Titles

The study sample included 201 studies published in 91 journals. Table 1 provides a list of the top 10 journals that meet our selection criteria, as outlined in the methodology section, and have published research on experiential tourism and technology. As elaborated in Table 1, the most prominent sources of experiential tourism research, as measured by the total number of publications are Sustainability (Switzerland) has published the most significant number of studies (23), followed by the “*Current Issues in Tourism*” and “*Journal of Travel Research*” each with 13 studies, “*Information Technology and Tourism*” and “*Tourism Management*” each contributing 8 studies in the research dataset. Further, the most influential sources of research in this area, as approximated by the total number of citations, are “*Journal of Travel Research*” (1749 citations) and “*Tourism Management*” (1,474 citations). Journal citation counts indicate that articles within a journal are acknowledged and used by other scholars in their research, thereby contributing to the advancement of knowledge in the research domain. The research articles in “*Current Issues in Tourism*” represent diverse disciplinary backgrounds, demonstrating the journal’s

Table 1 Most popular source titles

Source	Documents	Citations	h-index
“Sustainability (Switzerland)”	23	399	136
“Current Issues in Tourism”	13	302	94
“Journal of Travel Research”	13	1749	159
“Information Technology and Tourism”	8	183	30
“Tourism Management”	8	1,474	236
“Journal of Hospitality and Tourism Technology”	7	140	42
“Annals of Tourism Research”	5	749	201
“Tourism Recreation Research”	5	99	57
“Journal of Destination Marketing and Management”	4	460	63
“Journal of Heritage Tourism”	4	170	42
Note(s): Total Number of Source Titles = 91			
Source(s): Authors’ presentation using MS Excel and VOSviewer			

interdisciplinary nature. It encompasses fields such as tourism and hospitality research, marketing, and consumer studies related to travelers’ mental health and well-being, experiencing cultural heritage, and innovative experiential tourism offerings, such as virtual museum tours, interactive exhibits, and sustainable tourism. The “*Current Issues in Tourism*” not only published articles on theory advancement in tourism research but also focus on applied research. This approach ensures a comprehensive examination of both theoretical development and practical applications in the field.

3.3 Geographical distribution of publications

Regarding geographic distribution (Table 2), the sample demonstrated widespread interest in experiential tourism and technology, with published papers originating from 60 different nations. Notably, the topic exhibited a significant concentration in the United States (39 papers), United Kingdom (25 papers), China (22 papers), Spain (18 papers), and Italy (16 papers). This implies that these countries are pioneers in advancing research in this domain. Countries such as the United States, the United Kingdom, and China have a strong focus on technological advancements (U.S. News, 2023), they are likely to be at the forefront of studying the intersection of technology and experiential tourism. Spain and Italy are major tourist destinations, with well-established tourism industries (Cortes-Jimenez, 2008). These patterns suggest that countries with either technological advantages or tourism dependency are more likely to engage in this type of research.

3.4 Most prolific authors

Table 3 presents the top 11 most prolific authors of experiential tourism. The most prolific author in the study area was Ulrike Gretzel, with six articles. Furthermore, in terms of total citations, Daniel R. Fesenmaier is the most impactful author, with 1,107 citations followed by Dan Wang (608 citations), Dimitrios Buhalis (526 citations), Iis P. Tussyadiah (469 citations) and Ulrike Gretzel (380 citations). Fesenmaier examined various aspects related to experiential tourism and technology, such as how tourists share and reflect on their experiences after their journeys and how visual content shared through videos influences tourists’ decisions and smartphone usage in the context of tourism experience sharing (Wang et al., 2012, 2016). Overall, Fesenmaier’s studies present a comprehensive exploration of the dynamic

Table 2 List of focus countries in experiential tourism research via technology			
Country	Documents	Citations	Total link strength
United States	39	4,227	16
United Kingdom	25	1,385	12
China	22	745	16
Spain	18	539	9
Italy	16	169	3
Australia	15	760	8
Portugal	12	230	6
South Korea	11	264	5
Hong Kong	7	685	8
Macao	5	176	5
Malaysia	5	87	3
South Africa	5	2	2
Indonesia	4	22	2
Netherlands	4	162	3
United Arab Emirates	4	266	4
Note(s): Total Number of Countries = 51			
Source(s): Authors’ presentation using MS Excel and VOSviewer			

Table 3 Most publishing authors			
Author	Documents	Citations	Total link strength
Gretzel U.	6	380	0
Chung N.	4	111	0
Fesenmaier D.R.	4	1,107	3
Buhalis D.	3	526	0
Kastenholz E.	3	55	0
Neuhofer B.	3	80	0
Shen S.	3	42	4
Sotiriadis M.	3	42	4
Tussyadiah IP.	3	469	2
Wang D.	3	608	3
Zhang Y.	3	46	2
Note(s): Total Number of Authors = 487			
Source(s): Authors' presentation using MS Excel and VOSviewer			

relationship between technology and various facets of tourism experience. From post-trip reflections on the influence of shared videos and the broader role of smartphones, these papers contribute to a nuanced understanding of the evolving landscape in which technology and tourism intersect. Wang's study contributes to a nuanced understanding of contemporary dynamics in tourism. It explores the evolving landscape of tourism experience sharing and destination image construction in the context of changing media, and provides insights into the strategic approach to smart tourism, with a specific emphasis on service-dominant logic.

3.5 Most prolific journal articles

Table 4 presents a list of the highly influential publications in this area of research. The most cited study is "Travel blogs and their implications for destination marketing" (Pan *et al.*, 2007), with a citation count of 527. This indicates the significance and annual impact of the research field. This study focused on the influential role of travel blogs in promoting and shaping travel destinations. The second most cited article is "Innovation strategies and technology for experience-based tourism" (Stamboulis and Skayannis, 2003), with 469 citations. This article discusses a broader spectrum of technological interventions that provide a strategic framework for leveraging innovation to create immersive and technology-driven experiences. This is followed by "Mediating Tourist Experiences Access to Places via Shared Videos (Tussyadiah and Fesenmaier, 2009)" with 402 citations. It investigated the impact of shared videos on tourism, offering insights into how digital platforms mediate and influence tourists. Thus, the above studies explore the emerging context of tourism experiences in the digital age, emphasizing the role of technology in shaping travellers' perceptions. Thus, it can be stated that innovative digital tools can reform destination marketing and elevate the overall experience-based tourism (Neuhofer *et al.*, 2015). This high number of citations highlights its ongoing importance and role in influencing new academic work in this area.

3.6 Co-word analysis/keyword analysis

In this section, the most popular keywords identified in the database are presented. As depicted in Table 5, the most frequently occurring keywords identified are "tourism," "tourist destination," "tourist behavior," "tourist experience," "social media," "technology adoption," "tourism management," "virtual reality," "information and communication technology," "technology." These terms indicate a strong scholarly focus on how digital tools and platforms influence travel decisions, destination marketing and experiential engagement. The presence of keywords such

Table 4 Top cited documents

Authors	Title	Year	Source title	Cites	Cites per year
Pan B.; MacLaurin T.; Crotts J.C.	"Travel blogs and the implications for destination marketing"	2007	"Journal of Travel Research"	527	32.93
Stamboulis Y.; Skayannis P	"Innovation strategies and technology for experience-based tourism"	2003	"Tourism Management"	469	23.45
Tussyadiah IP; Fesenmaier D.R.	"Mediating Tourist Experiences. Access to Places via Shared Videos"	2009	"Annals of Tourism Research"	402	28.71
Crang M	"Picturing practices: Research through the tourist gaze"	1997	"Progress in Human Geography"	319	12.26
Zeng Z.; Chen P.-J.; Lew A.A.	"From high-touch to high-tech: COVID-19 drives robotics adoption"	2020	"Tourism Geographies"	314	104.66
Wang D.; Xiang Z.; Fesenmaier D.R.	"Smartphone Use in Everyday Life and Travel"	2016	"Journal of Travel Research"	312	44.57
Buhalis D.; Foerste M	"SoCoMo marketing for travel and tourism: Empowering co-creation of value"	2015	"Journal of Destination Marketing and Management"	300	37.50
Stepchenkova S.; Zhan F	"Visual destination images of Peru: Comparative content analysis of DMO and user-generated photography"	2013	"Tourism Management"	295	29.50
Alaei A.R.; Becken S.; Stantic B	"Sentiment Analysis in Tourism: Capitalizing on Big Data"	2019	"Journal of Travel Research"	288	72
Kounavis C.D.; Kasimati A.E.; Zamani E.D.	"Enhancing the tourism experience through mobile augmented reality: Challenges and prospects"	2012	"International Journal of Engineering Business Management"	250	22.72
Wang D.; Xiang Z.; Fesenmaier D.R.	"Adapting to the mobile world: A model of smartphone use"	2014	"Annals of Tourism Research"	235	26.11
Huang C.D.; Goo J.; Nam K.; Yoo C.W.	"Smart tourism technologies in travel planning: The role of exploration and exploitation"	2017	"Information and Management"	233	38.83
Kang M.; Schuett M.A.	"Determinants of Sharing Travel Experiences in Social Media"	2013	"Journal of Travel and Tourism Marketing"	208	20.80
Huang Y.-C.; Backman S.J.; Backman K.F.; Moore D	"Exploring user acceptance of 3D virtual worlds in travel and tourism marketing"	2013	"Tourism Management"	193	19.30
Bogicevic V.; Seo S.; Kandampully J.A.; Liu S.Q.; Rudd N.A.	"Virtual reality presence as a preamble of tourism experience: The role of mental imagery"	2019	"Tourism Management"	174	43.50
Note(s): Total Number of Authors = 201					
Source(s): Authors' presentation using MS Excel and VOSviewer					

as "perception," "travel behavior," and "smart tourism" smart tourism also suggests that research in this area increasingly emphasizes both the technological integration and psychological dimensions of tourism.

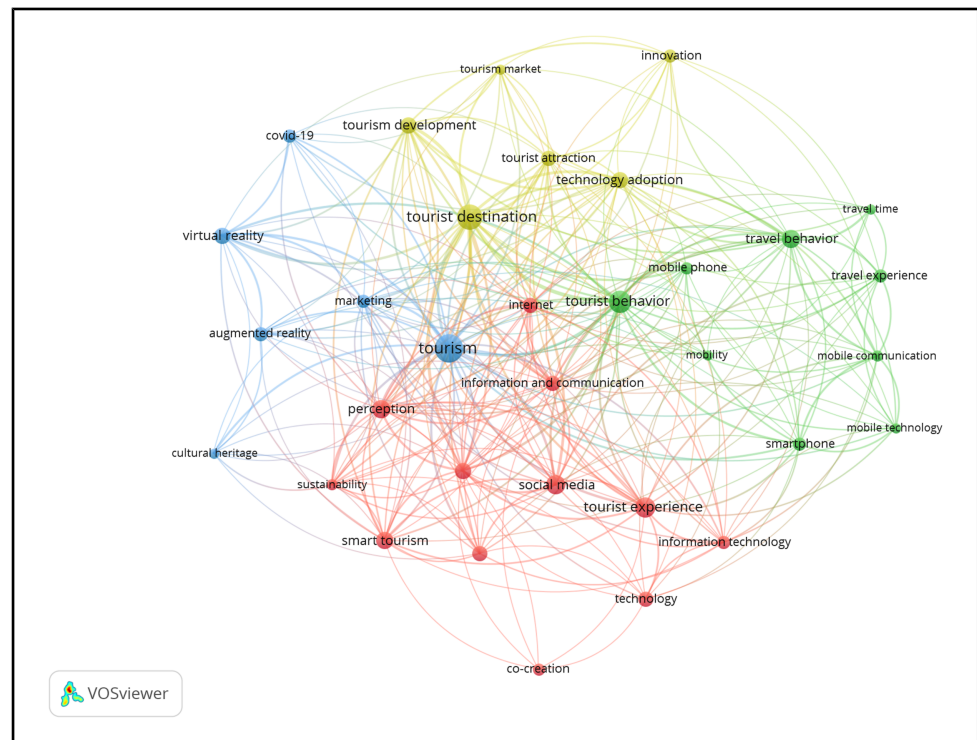
Moreover, bibliometric content analysis using co-word analysis in VOSviewer 1.6.20 was employed to construct a conceptual map (Figure 3). This map illustrates the relationships between the keywords present in the database, where each node within the network represents a keyword. To focus on high-frequency keywords, a minimum occurrence threshold of 5 was applied, which resulted in 1,057 unique keywords. A conceptual map based on co-occurrence strength was generated where node size corresponds to the frequency of a keyword's occurrence; a larger node signifies a higher frequency. The connections between nodes illustrate the co-occurrence between keywords, indicating keywords that appear together in the literature. The thickness of these connections denotes the frequency of co-occurrence, and thicker lines signify a higher frequency of keywords appearing together. This map visually represents the interconnectedness and associations among various key topics and their connections within the field of study. Moreover, colors differentiated the thematic clusters. The nodes and links within a cluster collectively convey the thematic coverage of the

Table 5 Most popular keywords

<i>Keyword</i>	<i>Occurrences</i>	<i>Total link strength</i>
Tourism	42	125
Tourist destination	33	152
Tourist behavior	27	112
Tourist experience	22	64
Social media	19	64
Perception	17	80
Travel behavior	17	65
Smart tourism	16	48
Technology adoption	15	71
Tourism development	15	70
Tourism management	15	69
Virtual reality	15	53
Information and communication technology	13	56
Technology	13	18
Internet	12	46
Tourism experience	12	34
Tourist attraction	12	49
Augmented reality	11	26
Innovation	10	23
Marketing	10	51

Note(s): Total Number of Keywords = 1,057

Source(s): Authors' presentation using MS Excel and VOSviewer

Figure 3 Keyword co-occurrence network. Source: Authors' presentation using VOSviewer

topics. This includes the nodes (topics) covered and the relationships (links) between these topics, all encapsulated under the umbrella of a specific theme (cluster). For instance, the keyword “tourist behavior” demonstrates strong links with keywords such as “travel experience”, “travel behavior”, “mobile technology” and “travel time” in green color (Figure 3). Similarly, the keyword “information and communication” exhibits strong connections with other keywords such as “co-creation”, “tourist experience”, “social media” and “information technology” as illustrated in red color (Figure 3) and so on.

4. Content analysis

This section presents the content analysis derived from the thematic clusters identified through the co-word analysis discussed in Section 3.5. The clusters were generated using the VOSviewer algorithm, which grouped frequently co-occurring keywords into distinct color-coded clusters. Further, we conducted a manual content analysis for each cluster to identify the most common keywords per cluster. This involved reading all the articles linked to each cluster and examining the most frequently occurring keywords. Each author independently conducted open coding to identify themes, followed by the discussion to refine and merge codes through axial coding. This process led to the identification of meaningful themes, ensuring that the themes were based on real patterns in the data rather than random choices. As a result, four thematic clusters emerged are “Technology adoption in travel and tourist behavior,” “ICT and Co-Creation in Tourism experience”, “AR and VR, and other technology,” and “Technology adoption, innovation, and tourism development.” The following subsections discuss each cluster in detail:

4.1 Cluster-1 Technology adoption in travel and tourist behavior

As depicted in Table 6, which presents a few sample studies from Cluster 1, the studies in this cluster discuss the implementation of robotics and artificial intelligence (AI) in travel and tourism hastened during the COVID-19 pandemic in services such as contactless services, sanitization,

Table 6 Cluster 1: technology adoption in travel and tourist behavior		
Authors	Title	Findings
“Zeng et al. (2020)”	“From high-touch to high-tech: COVID-19 drives robotics adoption”	The COVID-19 pandemic accelerated the adoption of robotics and AI in travel and tourism, aiding in contactless services, sanitization, health monitoring, and emotional support, contributing to enhanced health and safety measures
“Liu and Park (2024)”	“Exploring the impact of metaverse tourism experiences on actual visit intentions: An integrated model of presence, the Technology Acceptance Model, and the Theory of Planned Behavior”	There is positive impact of metaverse tourist experience on users’ actual visit intentions with an integration of the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB). The presence of technology is positively associated with perceived ease of use, perceived usefulness and attitude of users
“Chung et al. (2024)”	“The impact of smartphone usage on domestic travelers’ existential authenticity and behavioral perception toward island destinations: A cross-country comparison of Hainan Island and Jeju Island”	Destinations should adopt and expand smart tourism technology strategies tailored to align with travelers’ cultural backgrounds, to boost their satisfaction levels and increase their likelihood of returning
“Lu et al. (2015)”	“Goodbye maps, hello apps? Exploring the influential determinants of travel app adoption”	Perceived usefulness, ease of use, and compatibility are the factors strongly influence the adoption of travel apps by tourists in rural Chinese Tourism sites. Additionally, self-efficacy indirectly affects usage intention through outcome expectations, while social norms were not found to be significant predictors
“Wang et al. (2017)”	“Technology Readiness and Customer Satisfaction with Travel Technologies: A Cross-Country Investigation”	Technology readiness (TR) traits, particularly optimism and innovativeness, significantly influence travelers’ satisfaction with TESs (Technology-enabled services). The dimensions of optimism and innovativeness within TR, along with the country of residence, moderate the relationship between perceived TES quality, satisfaction, overall satisfaction, and future behavior
Source(s): Authors’ compilation		

health monitoring, and emotional support (Gretzel and Zheng, 2020; Zeng *et al.*, 2020). This rapid use of technology has helped management improve safety and contactless services, and create interactive customer experiences (Any *et al.*, 2024). Wang *et al.* (2014) explored the use of mobile devices, especially smartphones, by travelers, and found smartphone use for travel is influenced by complex connections between settings, cognitive beliefs, experiences, and daily usage, demonstrating its transformative potential for the tourist experience. Lou *et al.* (2017) argued for the replacement of traditional maps with mobile travel apps for travel assistance in their study. The rapid growth of mobile applications has shaped tourist attitudes through context-based proactive recommendations from mobile devices (Tussyadiah and Wang, 2016). Tourists find confidence in proactive recommendations from smartphones and perceive them as having proactiveness, autonomy, social ability, and intelligence (Marine-Roig, 2017; Tussyadiah and Wang, 2016). However, concerns arise from perceived reactivity and control, leading to the fear of losing control over tourism experiences, highlighting a paradoxical relationship between smartphone-mediated enhancements and reductions in travel experiences.

Huang *et al.* (2013) studied the use of 3D technology in travel and tourism, based on the hedonic theory of humans. One of the earlier studies explored the use of technology to understand hedonic behavior through tourist preferences for entertainment, pleasure, and emotions, and also checked how it affected visitors' experiences and intentions in 3D virtual tourism locations (Chung *et al.*, 2024). Technology use enhances satisfaction and provides a better experience, particularly for airlines (Wang *et al.*, 2017). These studies have demonstrated that satisfaction with technology-enabled services (TESs) is strongly influenced by technology readiness (TR) is a personality feature that strongly influences satisfaction with technology-enabled services. The link between perceived TES quality, satisfaction, total satisfaction, and future behavior is moderated by the TR aspects of optimism and inventiveness as well as the country of residence.

Marine-Roig (2017) analyzed the perceived tourist destination image (TDI) derived from online travel reviews (OTRs) discovered in search engines. The research centered on 387,414 TripAdvisor OTRs on "Things to Do," which shows that technology caters to a list of tourist activities without any hassling. The results consistently provide valuable insights and business intelligence regarding the cognitive, spatial, temporal, evaluative, and affective dimensions of tourist destination image. Jeong and Shin (2020) demonstrated the use of technology for smart tourism at tourist destinations and its effects on the tourism industry. Smart tourism technology and memorable experiences are moderated by perceived security and privacy. The satisfaction of tourists with smart tourism technology was the most influential attribute, whereas personalization was low. Smart tourism technology experience is linked to travel satisfaction, which positively impacts both tourist happiness and revisit intention (Pai *et al.*, 2020; Torabi *et al.*, 2022). One may also argue that smart tourism destinations create ambience for smart travelers, because the presence of one is complementary to another.

The features of smart tourism technology, namely informativeness, interactivity, and personalization, have a substantial influence on tourists' overall experience, contentment, and intention to revisit (Peong *et al.*, 2024). The moderating effects of perceived security and privacy levels on the links between speech-to-text features and memorable experiences were significant. The level of satisfaction experienced by tourists is affected by two key factors: the utilization of smart tourism technology and the perceived value of the site. This underscores the importance of elements related to a destination in influencing tourists' well-being (Liu and Park, 2024). Dimensions, such as the cognitive, geographical, temporal, evaluative, and emotive aspects of online travel reviews, can be accessed through search engines (Gretzel and Yoo, 2008). These variables offer significant insights into navigating businesses by adopting technology in the tourism industry, and this process shapes tourist behavior.

Thus, Cluster 1 illuminates the use of technology in tourism; features such as accessibility, interaction, formativeness, personalization, and security be associated with creating unique experiences. This, in turn, has a significant influence on both visitors' happiness and intention to

revisit. This highlights the notable impact of technology on the improvement of visitor experiences and its potential contribution to the advancement of smart tourism. Many tourists derive a sense of assurance from advice through smartphones for being proactive, autonomous, socially adept, and intelligent. Nonetheless, there are concerns over the perceived reactivity and control associated with smartphone-mediated upgrades in tourism experiences. These issues give rise to the fear of losing control over one’s vacation experiences, exposing a paradoxical relationship between the benefits brought about by smartphones and potential drawbacks in terms of reduced trip experiences.

4.2 Cluster 2 – ICT and co-creation in tourism experience

The studies in Cluster 2 focus on the importance of technology in the co-creation of the tourism experience, empowering users to gather information from diverse sources, personalizing profiles via apps and social networks, and interacting contextually (Buhalis and Foerste, 2015). Table 7 presents a few sample papers from cluster 2. The study on “Social Context Mobile” (SoCoMo) found that it creates a framework enabling tourism marketers to enhance stakeholder value through dynamic co-creation of products and services, revolutionizing the industry’s approach and utilizing real-time data from smart destinations (Jeong and Shin, 2020; Kim and Fesenmaier, 2017; Lee et al., 2018) work on social media, and the study reveals that sharing positive post-trip experiences increases positive emotions and decreases negative ones, leading to more positive overall evaluations. Additionally, sharing negative experiences with social media mitigates negative perceptions, thereby enhancing post-trip evaluation.

Lam et al. (2020) studied in the context of online travel review sites. This study focuses on the complexity of experiential value cocreation. It identifies elements that influence the platform co-creation experience such as perceived utility, usability, aesthetics, and homophily. This study highlights the influence of user-generated platforms on destination image development and the improvement of travel experience by demonstrating substantial correlations between platform

Table 7 Cluster 2 – ICT and co-creation in tourism experience		
Authors	Title	Findings
“Buhalis and Foerste (2015)”	“SoCoMo marketing for travel and tourism: Empowering co-creation of value”	Social Context Mobile (SoCoMo) marketing, uniting context-based marketing, social media, personalization, and mobile devices, creates a framework enabling tourism marketers to enhance stakeholder value through dynamic co-creation of products and services, revolutionizing the industry’s approach and utilizing real-time data from smart destinations
“Kim and Fesenmaier (2017)”	“Sharing Tourism Experiences: The Post trip Experience”	Sharing positive post-trip experiences enhances positive feelings and diminishes negative ones, contributing to more favorableS overall evaluations. Additionally, sharing unsatisfactory experiences on social media helps alleviate negative perceptions, subsequently improving post-trip evaluations
“Pasquinelli et al. (2023)”	“Online tourism experiences: exploring digital and human dimensions in in-remote destination visits”	The evolving nature of fully online tourist experiences during the pandemic emphasized the increasing importance of human interaction despite digital mediation. However, virtual tourism offers new opportunities for destination management and marketing research and practice
“Mieli (2024)”	“Planned serendipity: exploring tourists’ on-site information behaviour”	Now tourists use information on-site with the widespread access provided by smartphones. This “phygital” environment both aids and limits spontaneous discoveries which coexist in travel planning and shows that using smartphones in research enhances accuracy and real-world relevance by reducing recall bias
“Lyons et al. (2016)”	“Changing times – A decade of empirical insight into the experience of rail passengers in Great Britain”	Changes in rail passenger experiences over a decade in Great Britain coincide with increased internet and smartphone use. While digital alternatives replace paper-based materials, the perceived worthwhileness of travel time doesn’t consistently improve due to factors like increased crowding and reduced passenger satisfaction. The need for the rail industry to support positive use of travel time despite the increasing control provided by mobile technologies
Source(s): Authors’ compilation		

co-creation experience, cognitive and affective destination images, and overall travel pleasure. The research results advance the knowledge of the function of platform use experiences in co-creation and their impact on travelers' pleasure and destination perceptions (Buonincontri and Micera, 2016; Mieli, 2024).

The creative class in society is characterized by increasing mobility and technological creativity support (Gretzel and Jamal, 2009; Marine-Roig, 2017). This course blurs the lines between daily life and tourism, challenging the traditional categories of tourist experiences. The tourism experience is captured through a multidimensional "tourism experience sphere" to capture the unique experiences of the Creative Class and advocates for interdisciplinary research to comprehend the implications of this phenomenon on tourism practice and marketing. Information and Communication Technology (ICT) greatly affects tourists' destination choices, experiences, and satisfaction (da Costa Liberato, 2018; Liberato *et al.*, 2018). These studies show that the presence and use of ICTs, such as smartphones, applications, and Internet connectivity, have a major impact on tourist satisfaction and experience.

The above studies demonstrate the value of integrating technology to improve visitor experiences and offer suggestions for smart destination management and innovation in tourism products and services (Pasquinelli *et al.*, 2023). Social media has become tourists' sense of assurance of information and proactive advice (Wang, 2021). Nevertheless, there are apprehensions over the perceived reactivity and control associated with smartphone usage, which gives rise to concerns about losing control over one's tourism experiences. This brings attention to the paradoxical nature of the interaction between smartphone-mediated augmentation and potential diminishment of travel experiences. As digital alternatives continue to supplement paper-based goods, the perceived value of journey time does not continually increase, primarily because of issues such as heightened congestion and diminished customer satisfaction. Smart technology can be used in the implementation of experience co-creation during phases of the experience process to improve interaction with tourists and encourage active participation (Buonincontri and Micera, 2016).

The use of ICTs also allows users to develop content, providing a substantial connection between the experience of co-creation, cognitive and affective destination pictures, and the overall happiness of travel. The utilization and accessibility of ICTs, including Internet connectivity, cell phones, and various applications, exert a substantial impact on the experiences and overall happiness of travelers. The incorporation of technology plays a crucial role in boosting tourists' overall experience, although it is not absolute in all cases. These technologies can improve tourist decision-making, increase overall travel experiences, and facilitate the sharing of impressions.

4.3 Cluster 3 – AR and VR, and other technology and tourism transformation

The studies in Cluster 3 primarily examined how AR, VR, and other modern technologies have changed the tourism sector. The sample studies of Cluster 3 are listed in Table 8. Modern studies highlight how modern technologies are changing how travelers choose places, plan visits, and experience culture. The results revealed many potential difficulties, highlighting the importance of technology in improving experiences, altering perceptions, and driving innovation in the dynamic tourism landscape. Kounavis *et al.* (2012) traced the development of AR from experimental prototypes to commercial smartphone applications. Their research revealed the technical details and technologies behind effective AR experiences and proposed a way to overcome technological limitations. This shows AR's potential to transform the nature of business, as well as the features of products and services.

Bogicevic *et al.* (2019) studied the involvement of VR in tourism to explain how it shapes pre-trip anticipation. VR previews increase engagement and affinity with hotel services by providing vivid mental imagery and heightened sense of presence. This shows VR's capacity to build anticipation and familiarity with destinations before people arrive. Research has shown that AR and VR have

Table 8 Cluster 3 – AR and VR and other technology

Author	Title	Findings
"Lim <i>et al.</i> (2024)"	"Augmented and virtual reality in hotels: Impact on tourist satisfaction and intention to stay and return"	Tourists are positively influenced to adopt AR and VR for hotel bookings due to their perceived ease of use, innovativeness, and usefulness, which enhance satisfaction. Although concerns about associated risks exist, they do not notably discourage return visits
"Bogicevic <i>et al.</i> (2019)"	"Virtual reality presence as a preamble of tourism experience: The role of mental imagery"	The role of VR is very important in shaping pre-trip anticipation and engagement with lodging offerings. The VR previews trigger vivid mental imagery and a heightened sense of presence, leading to improved brand experiences. VR has potential to foster a sense of familiarity and excitement even before travelers embark on their journeys
"Zhang <i>et al.</i> (2022)"	"Investigating the Impact of Smart Tourism Technologies on Tourists' Experiences"	Smart technology positively impacts word-of-mouth recommendations, revisit intention, and willingness to pay a price premium. So, by providing better infrastructure and good services can improve visitor attractions and tourism competitiveness
"Chiao <i>et al.</i> (2018)"	"Examining the usability of an online virtual tour-guiding platform for cultural tourism education"	A VR tour-guiding platform employs the Unified Theory of Acceptance and Use of Technology (UTAUT) model to assess technology acceptance. Findings reveal positive outcomes in terms of learning effectiveness and technology acceptance among students. It emphasizes the indirect impact of interaction on technology use, highlighting the significance of human-device interaction within digital tour environments
"Moro <i>et al.</i> (2019)"	"Analysing recent augmented and virtual reality developments in tourism"	Most AR research focuses on mobile technology, with limited exploration of Comdevices. Additionally, there's a notable absence of research using Big Data and machine learning approaches based on secondary data. Hence, there is need for continued research to bridge these gaps and advance understanding of AR and VR applications in tourism

Source: Authors' compilation

major impacts on cultural heritage tourism. [Han *et al.* \(2018\)](#) emphasized how AR product features affect travelers' perceptions, creating a unique user experience. This paradigm emphasizes the importance of implementing full AR in constrained use scenarios. [Graziano and Privitera \(2020\)](#) discuss AR in cultural heritage and the necessity of reconciling modern technology with a sustainable strategy for long-term value.

[Chiao *et al.* \(2018\)](#) evaluated the usability of a VR tour-guiding platform. Human-device interaction and technology acceptance are linked in digital tour environments, as shown in their research. [Moro *et al.* \(2019\)](#) used text mining and topic modeling to identify tourism AR and VR trends. They emphasize the necessity for ongoing research and inquiry to fill gaps and increase understanding in this fast-expanding sector.

Researchers agree that AR and VR improve travellers' experiences. [Huang \(2021\)](#) found that AR empowerment elements improve immersion and willingness to pay premium prices. [Lacka \(2020\)](#) found that location-based AR games can affect travellers' destination choices by boosting their knowledge, motivation, and engagement. These technologies have redefined the tourism paradigms. VR redefines communication, marketing, and customer expectations, resulting in realistic virtual travel, engaging experiences, and innovation ([Pestek and Sarvan, 2020](#)). [Jiang *et al.* \(2023\)](#) found that AR experiences at heritage sites improve tourism memorability and mediate tourist attitudes and behaviors.

Finally, we conclude that AR, VR, and sophisticated technology affect tourism in several ways. These technologies provide opportunities to change how travelers interact with destinations, plan vacations, and experience culture ([Sustacha *et al.*, 2023](#)). The findings also emphasize the need to link technological innovation with human-centered ideals, sustainable practices, and holistic considerations. Cluster 3 demonstrates how technology may innovate, improve experiences, and change how travelers see and interact with the world as the tourism industry evolves. The

communication and responsiveness of the tourism and hospitality sectors to travelers' requirements have been significantly affected by recent developments in VR (Lim et al., 2024). These include the implementation of technology-driven marketing strategies and changing consumer expectations. Currently, the tourism industry is undergoing paradigm transformations characterized by the emergence of several trends, such as realistic virtual travel, interactive experiences, and innovation.

Thus, the incorporation of cutting-edge technologies, including AR, amplifies tourist encounters at cultural heritage sites. For example, the use of audio-visual displays at heritage sites creates a unique experience for tourists and a lasting impression. AR plays a significant role in achieving a balance between technological innovation and sustainability in the context of heritage tourism by employing a multimethod approach that includes field observations and stakeholder interviews.

4.4 Cluster 4 Technology adoption, innovation, and tourism development

The studies in Cluster 4 (sample studies presented in Table 9) emphasize the diverse effects of technology on tourist experiences, innovation, conscious design, responsible behaviors, and stakeholder collaboration. Technology continues to revolutionize how passengers connect with destinations, services, and their environment. Technology-driven tourism development, which is a human-centered design, is essential for improving the tourist experience. Stankov and Gretzel (2020) emphasized the necessity of properly designed Tourism 4.0 technologies to meet human needs. Elshaer and Marzouk (2024) agreed that hotel innovations link smart technologies to a great tourist experience. These findings highlight the need for technology to align with human-centric values and for the industry to balance cutting-edge innovations with a deeper understanding of the human elements of travel.

A study by Lou et al. (2017) on QR code payment technology revealed how benefits, compatibility, and observability affect visitor acceptability. Smart Tourism Technology experience research by Pai et al. (2021) reveals how favorable technology views improve travel experiences and revisit intentions. These studies suggest that seamless technological integration improves tourist

Table 9 Cluster 4 – technology adoption, innovation and tourism development		
Author	Title	Findings
“Stankov and Gretzel (2020)”	“Tourism 4.0 technologies and tourist experiences: a human-centered design perspective”	While technological advancements can enhance tourist experiences, they often lack human-centered design. The concept of Tourism 4.0 and its technology-driven transformations in the tourism industry needs to underline the importance of human-centered design for positive outcomes and avoid potential harm
“Gabor et al. (2023)”	“Innovative Tourism Products as Sustainable Solutions for Emerging Economies”	To innovate tourism products/services or form of innovative tourist packages is an important tool for economic growth and competitiveness of experiential tourism
“Stankov et al. (2020)”	“E-mindfulness – the growing importance of facilitating tourists’ connections to the present moment”	The e-mindfulness as a growing tourism trend, characterized by the integration of mindfulness meditation with technology applications, presents opportunities for the tourism industry and suggests changing consumer perspectives on tourist experiences
“Muniz et al. (2021)”	“Customer knowledge management and smart tourism destinations: a framework for the smart management of the tourist experience – SMARTUR”	Customer Knowledge Management (CKM) can aid Destination Management Organizations (DMOs) in smart management of tourist experiences to create smart solutions and promote Smart Tourism Destinations (STDs)
“Pai et al. (2021)”	“An examination of revisit intention based on perceived smart tourism technology experience”	The perceived Smart Tourism Technology (STT) experiences offer valuable insights for destination managers and STT developers to enhance competitiveness through strategic use of technology to improve travel experiences and encourage return visits
Source(s): Authors’ compilation		

convenience, destination satisfaction, and loyalty. (Stankov *et al.*, 2020)'s e-mindfulness movement integrates traditional techniques with technology. This mindfulness-technology concept changes how travelers engage with their surroundings. This trend strengthens travelers' environmental ties, demonstrating how technology can improve their well-being and discovery. The study of the Customer Knowledge Management (CKM) framework by Muniz *et al.* (2021) explains how DMOs can use technology and social media to develop smart visitor experiences. Chung *et al.* (2019) linked green technology deployment to destinations' CSR activities by studying how eco-innovative practices affect tourists' emotions. Gunduz Songur *et al.* (2023) reported that most guests nowadays favor green hotels because of their heightened awareness of environmental degradation. The recent entry and role of blockchain technology for travelers and service providers has been to enhance transparency, trust, and autonomy (Raluca-Florentina, 2022; Wang *et al.*, 2022), and smart technologies are employed across diverse domains, including information platforms, tourism statistics, experience co-creation, and marketing. Technologies also help to underscore the significance of public-private collaborations and highlight the experiences and problems that may offer valuable insights for the development of smart tourism in different destinations.

Hence, from Cluster 4, we see how technology adoption, innovation, and the tourism industry transformation are linked. Tourist experiences can be improved through human-centered technology. QR code payments, Smart Tourism Technology, and e-mindfulness have revolutionized how tourists interact with destinations, illustrating how technology may improve discovery and well-being. However, these breakthroughs must be used intelligently to maximize sustainability as well as ecological and social effects (Gabor *et al.*, 2023). For example, visitors perceive eco-innovations as a component of Corporate Social Responsibility (CSR) initiatives undertaken by destinations, thus exerting a favorable influence on tourists' emotions and inclinations to engage in word-of-mouth communication. Smart technologies are employed in diverse domains including information platforms, tourism statistics, experience co-creation, and marketing. This underscores the potential of leveraging smart technology and creative approaches within the hotel industry to enhance the overall quality of guests' experiences.

Technological advancement provides enhanced independence for those who are traveling, and promotes openness and accountability for service providers, thereby cultivating confidence and transparency throughout the process, ranging from itinerary creation to receiving comments. The COVID-19 pandemic has resulted in a surge in the popularity of noncontact tourism, creating a heightened need for Internet technologies such as IoT, VR, and AR. The development of ice and snow tourism is increasingly centered on leveraging internet technology to improve tourist experiences and maximize associated profits. This strategic approach emphasizes mitigating potential risks and exploiting advantageous circumstances.

5. Discussion and conclusion

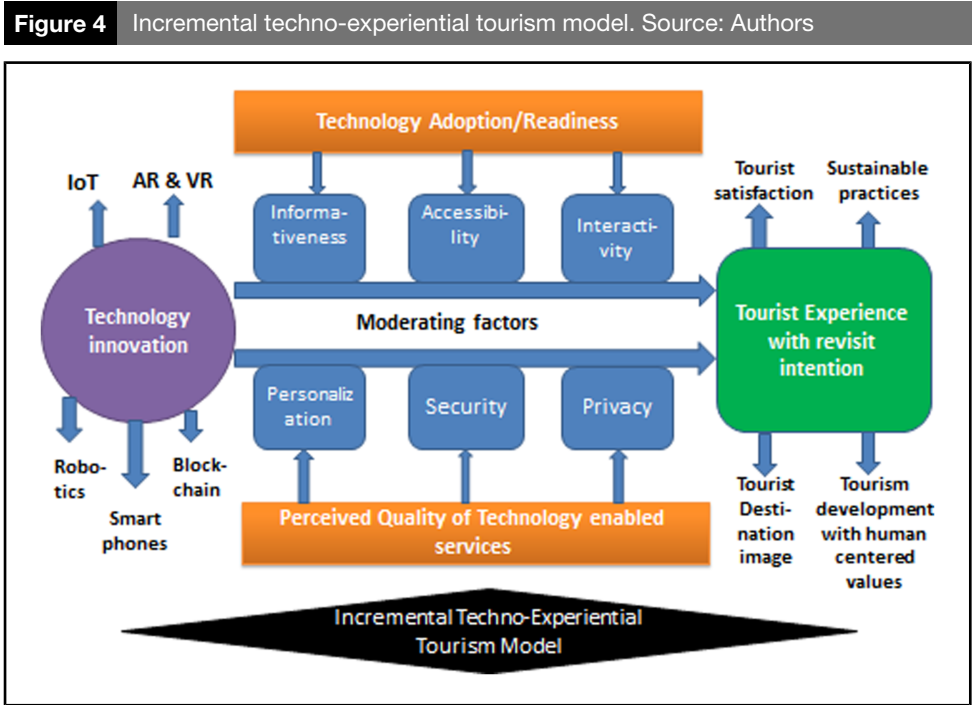
Our SLR-based study revealed a quantitative and thematic map of experiential tourism and technological research. Daniel R. Fesenmaier, from Temple University, USA, is the most prolific author, and "Travel blogs and their implications for destination marketing" is the most popular study. The United States, United Kingdom, and China are the three most advanced countries publishing technological advancements in the tourism sector. The content analysis (qualitative) revealed four thematic clusters which are; "Technology adoption in travel and tourist behavior," "ICT and Co-Creation in Tourism experience", "AR and VR, and Other Technology," and "Technology Adoption, Innovation, and Tourism Development." Thus, based on the findings of the SLR, we can conclude that utilizing technology-driven solutions has resulted in notable enhancements in visitor experiences. The integration of technology into tourism, with features such as accessibility, interactivity, informativeness, personalization, and security, has been shown to create unique and memorable experiences for travelers (Any *et al.*, 2024). These enhanced experiences significantly impact visitors' happiness and intentions to revisit destinations. The use of ICTs also empowers users to develop content, fostering a strong

connection between co-creation experiences, cognitive and affective perceptions of destinations, and travelers' overall happiness. These technologies enhance decision-making, elevate travel experiences, and facilitate the sharing of impressions. Technologies such as AR, VR, and other sophisticated innovations are transforming tourism in several ways. They offer new opportunities for travelers to interact with destinations, plan their vacations, and experience different cultures in more immersive and engaging ways.

Human-centered design in technology-driven tourism development is crucial for enhancing tourist experiences. These technologies also highlight the importance of public-private partnerships and provide valuable insights into the development of smart tourism destinations. Smart technologies are utilized in various areas, including information platforms, tourism statistics, experience co-creation, and marketing, demonstrating their potential to improve the overall quality of tourist experiences in this industry.

5.1 Conceptual framework

Based on our comprehensive review, we propose a conceptual framework called the “Incremental Techno-Experiential Tourism Model” (Figure 4) to conceptualize the fusion of experiential tourism and emerging technologies towards sustainable practices, including tourism development and tourist satisfaction. This framework is grounded in a theoretical synthesis that integrates insights from the Technology Acceptance Model (TAM) (Davis, 1989), the Experience Economy Framework (Pine and Gilmore, 2011), and principles of Sustainable and Smart Tourism Development (Neuhofer et al., 2015). These theoretical foundations will support tourism stakeholders in understanding the integration of technology-enabled tourism products and services to enhance their experiences. This will enable them to develop marketing strategies for adopting smart tourism technologies with essential features and to co-create the perceived usefulness and quality of technology-enabled services towards technology-driven tourism development with customer relationship management and smart tourist destination management.



The framework drafted is based on findings of clusters analysis, and it supports the stakeholders of tourism industry to increase memorable, satisfying consumer techno-experiences and inspiring destination revisit. It outlines a layered progression in which smart and innovative technologies (such as AI, IoT, and mobile platforms) are not merely operational tools but also catalysts for enhancing personalization, accessibility, informativeness, and interactivity.

The designed framework comprises dimensions identified in Cluster 1 (informativeness, accessibility, and interactivity) and Cluster 3 (innovative and smart technologies), which helps in shaping tourists' perception of service quality and ease of use, representing the key components of TAM (perceived usefulness, perceived ease of use). Studies within these clusters (Jeong and Shin, 2020; Zhang *et al.*, 2022) have highlighted the role of technological design features in shaping perceived usefulness and ease of use, showing tourist attitudes towards technology adoption and satisfaction. We also adopt the Experience Economy perspective (Pine and Gilmore, 2011) in the model, focusing on the importance of co-creating emotionally engaging, personalized, and memorable experiences. As seen in Clusters 1 and 2, research on personalization, safety, security, and privacy (Buhalis and Foerste, 2015; Zeng *et al.*, 2020) is based on how techno-friendly tourists participate in the co-creation of destination image, which eventually affects their overall experience. This exhibits that by leveraging technology, the tourism industry aims to enhance the tourist experience along with destination revisit intention. Moreover, recognizing the broader impact of technology on environmental responsibility, destination image, and stakeholder well-being, authors incorporated the sustainability concept (Cluster 4) in the proposed model. Stankov and Gretzel (2020) have depicted that innovative tourism initiatives should balance ethical considerations with innovation, inclusive governance, as well as long-term environmental sustainability. Therefore, the adoption of the given framework can aid the tourism sector to move towards happiness, tourist satisfaction, and sustainable practices along with green technology, tourist destination image, and holistic tourism development with more human-centered values.

In conclusion, leveraging smart technology and innovative approaches within the tourism sector can significantly enhance travelers' experiences, satisfaction, and likelihood of revisiting. By embracing these advancements, the tourism industry can continue to evolve, offering more personalized, engaging, and memorable experiences for tourists while promoting sustainable and smart tourism development. This ongoing transformation underscores the importance of integrating technology into tourism strategies to meet the evolving expectations of modern travelers and maintain a competitive advantage in the industry. Thus, based on the findings, this conceptual framework depicts the future research directions that the integration of smart innovative technology with human-centered values will not only enhance tourist techno-experience but also promote sustainable practices that will help to create a smart tourist destination image and tourism development. By focusing on both consumer experience and sustainability, tourism firms can build a loyal customer base that values and advocates responsible tourism, ultimately leading to a positive impact on both business growth and environmental conservation. Thus, the model offers a conceptual roadmap for future empirical validation, guiding researchers and practitioners toward a more integrated understanding of the role of technology in shaping experiential and sustainable tourism futures.

5.2 Theoretical implications

The current study provides important academic implications via the exploration of theoretical facets to illustrate how technology improves experiential tourism. The study contributes to the tourism literature by providing a techno-experiential framework that connects technological innovation with the adoption of technology, leading to a larger influence on tourist experiences and their revisit intention. It further builds on the Technology Acceptance Model (TAM) by involving hedonic and emotional dimensions via the notions of techno-experiential value. Also, it recognizes that visitor engagement with technology can differ based on their level of readiness towards technology. Parallely, it comprises the Experience Economy framework by aligning the

experiential realms, such as education, entertainment, with technology components such as accessibility, informativeness, real-time responsiveness, interactivity, and co-created digital content. The model further introduces the notion of sustainability by depicting how technology can aid with responsible tourism.

This study focuses on personalized and context-aware services that align with theories of customer relationship management and service-dominant logic, emphasizing the importance of tailoring experiences to individual preferences. Second, this study contributes to theories of sustainable tourism development and environmental management by highlighting how technology can mitigate the negative impacts on natural and cultural resources and promote sustainability. Furthermore, the exploration of real-time monitoring, smart infrastructure, personalized services, improved safety, and operational efficiency reflects theories of technology adoption, innovation diffusion, and service design, showcasing how technology can enhance various aspects of tourism.

Through this comprehensive analysis, this study identifies connections and patterns and draws nuanced conclusions about the evolution and thematic nuances of the travel experience in this digital era. These insights pave the way for future empirical investigation across diverse tourism contexts.

5.3 Practical implications

The practical integration of technology in the tourism industry blended hedonic theory in terms of tourist behavior and its interaction with the host destination. The utilization of technology-driven solutions has resulted in notable enhancements in visitor experiences. The following are a few practical implications for businesses and associated managers for insightful uses of technology that can be used to create wholesome experiences, in addition to the natural resources of the host community and for curating smart tourist destinations. The adoption of technology in the travel and tourism industry is a major factor in choosing destinations and shaping travel patterns.

The integration of AR, VR, and other related current technologies in tourism businesses has transformed the industry, made access easier, and helped choose destinations, arrange trips, and experience natural beauty with different cultural values. The destination marketer and manager must adopt technology as innovation for tourism development. For example, AR and VR technologies can be used to provide opportunities to virtually experience sites prior to physical visits. For example, virtual tours can be provided to individuals with the opportunity to gain a preliminary understanding of the attractions and offerings of a particular destination, enabling them to become more knowledgeable and make better choices when planning their travel.

We also recommend observations on technological adoption and innovation in tourism development, such as using a QR code for payment and a link for designated information, pinning destinations, Google Maps, etc. smooth business operations. The addition of technology has the potential to improve the convenience for tourists and influence their overall satisfaction, although one should be cautious about its overuse.

Artificial intelligence and chatbots can be used to capture the behavior and preferences of tourists. This capability allows organizations to provide customized advice, customize marketing initiatives, and enhance client experience. Thus, technological interventions in the travel and tourism business, such as providing efficacious solutions to enhance passenger comfort, convenience, ease of travel, and access to destinations, are always positive notes.

Thus, the recent development of technology and its integration into the tourism industry have provided tourists with enhanced accessibility to information, increased convenience, and tailored experiences, while simultaneously enabling enterprises to operate with greater efficiency and sustainability. The ongoing evolution of technology is expected to exert a greater influence on travel and tourist behavior in the future. However, service providers should be mindful of the

adoption of technology and the need to innovate human-centric technology to achieve positive outcomes while maintaining their long-term vision.

6. Future scope of this study

The intersection of experiential tourism and emerging technologies presents a dynamic and evolving field, with significant opportunities for future academic inquiry. Building on the insights synthesized in this review, several key directions are proposed for advancing research on how digital innovations such as AR and VR can reshape tourist engagement, experience design, and destination interaction. Future research could investigate how these tools impact the psychological and behavioral aspects of decision making before trips, engagement during visits, and memory retention. Moreover, the integration of smart technologies, such as data analytics, IoT sensors, and AI-driven personalization, into destination management systems is still largely unexplored. Researchers could assess how these systems can enhance resource efficiency, boost visitor satisfaction, and improve real-time responsiveness to promote sustainability, better resource management, and visitor satisfaction. Emerging technologies such as blockchain offer new opportunities to secure tourism transactions, manage digital identities, and increase transparency in service delivery. Further studies could explore how blockchain can build consumer trust, minimize transaction barriers, and protect sensitive traveler information in digital tourism environments. Evaluating innovative transportation solutions, including electric vehicles, autonomous shuttles, and shared mobility services, is crucial for reducing the environmental impacts of tourism. Research can assess the effectiveness of these systems in promoting carbon-conscious travel, alleviating urban congestion, and aligning them with broader sustainability objectives. The ethical and cultural consequences of smart tourism warrant further in-depth exploration. Scholars might investigate how digital tools affect the promotion of authentic experiences, community engagement, cultural heritage preservation, and minimization of negative impacts on host communities. There is a need to focus on integrating technological innovation with human-centered ideals, sustainable practices, and holistic considerations to align with human-centric values and balance cutting-edge innovations with a deeper understanding of the human elements of travel. Further research should explore human-centered AI for the social good, community-centered technological innovation for local empowerment, health-tech solutions for holistic wellness, and eco-innovation and green entrepreneurship to maximize sustainability and ecological and social effects through experiential tourism. Through systematic exploration and analysis of these areas, researchers seek to anticipate and harness the transformative potential of technology in shaping the future landscape of experiential tourism, fostering innovation and enhancing traveler satisfaction. Future studies could assess how digital tools influence community engagement, cultural heritage preservation, and authenticity in tourism experiences, particularly in destinations undergoing rapid technological adoption.

Finally, the model presented in this study provides a structured foundation for cross-cultural, comparative, and experimental investigations, enabling scholars to critically examine how the integration of smart, ethical, and sustainable technologies will shape the evolving landscape of experiential tourism.

Conclusively, as technology evolves, it is expected to exert greater influence on travel and tourist behavior in the future. Hence, tourism stakeholders should be mindful of adopting technology and strive to innovate human-centric technologies to achieve positive outcomes.

Supplementary material

The supplementary material for this article can be found online.

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