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Transforming tourism experiences: A literature mapping of Technology in Hospitality Industry

Dhanya Mohan P* and Rakesh Krishnan M†

Abstract

The customer service sector in hospitality is undergoing a positive transformation with continuous evolutions. This study comprehensively reviews the literature published on technology transfusion in the hospitality industry and its impact on customer experience, operational efficiency, and competitive-edge. Authors used bibliometric study for the literature mapping. The layout of the paper is to scan literature published during the last two decades and finally propose new research. The authors identified key areas: emerging technology in hospitality, innovation, technology expectations and service failure risks, and studies on the sharing economy in hospitality. They include research focusing on customer experiences, popularity, and use of AI, blockchain and robotics across the country, as well as customer operated technologies (SST) and the use of such technologies by customers in the sector. Finally, for industry practitioners and policymakers, the study give insights, regarding the potential advantages and challenges of adopting and implementing various kinds of technology in the hospitality sector and thus providing actionable insights for strategic decision-making and in policy formulation.The study is the comprehensive review of the published literature till 2025 and puts forward directions for researchers in the technology and hospitality industry.

Keywords: Hospitality Industry, Technology adoption, TAM, Bibliometric analysis, VOS viewer, AI and Robotics, theories of adoption

1. Introduction

The hospitality sector leads in using technology to improve guest experiences

* School of Management Studies, Cochin University of Science and Technology, Cochin, Kerala, India; dhanyamohanp@cusat.a.c.in; [0000-0002-4376-7223]

† School of Management Studies, Cochin University of Science and Technology, Cochin, Kerala, India; mrakeshkrishnan@cusat.ac.in

and operations. Recently, the rapid technology advancement has brought significant changes in how hospitality businesses' operate and serve (Connolly & Olsen, 2001). Modern innovations, like artificial intelligence (AI) and the Internet of Things (IoT), are revolutionizing the hospitality industry by enhancing efficiency, personalization, and connectivity (Gajić et al., 2024). The global health crisis has redesigned the world in conducting business around the globe. Various technologies have aided industries in keeping up with the coronavirus pandemic, which hit the world. The hospitality industry is the worst-hit industry during a crisis (Wut et al., 2021).

The use of machine learning algorithms to analyse guest behavior, help hotels offer personalized recommendations and enhance the guest experience (Zarezadeh et al., 2022). The IoT (Internet of Things) is another one that's making waves in this sector. Thermostats, lighting systems (Elkhwesky & Elkhwesky, 2023), energy conservation (Teng et al., 2012) are also among them. Robotic interactions further improves efficiency (Lukanova& Ilieva, 2019). In other words, some hotels use robots to deliver room service orders, while others employ robotic vacuum cleaners to maintain cleanliness in common areas. In their paper Shin and Jeong state that the use of robotics enhanced customer experiences in the hospitality segment (Shin & Jeong, 2020).

SSTs (Self-service) Technologies help transform the way guests interact with hospitality services (Wei et al., 2017). Newer technologies allow guests to bypass traditional front desk practices, providing a more streamlined and convenient experience (Buhalis et al., 2019). Additionally, digital-key solutions enable guests to unlock rooms, further enhancing convenience by using their smartphones (Park et al., 2021).

The digital and mobile payment technologies have also become widespread in the hospitality sector (Karim et al., 2022). Contactless payments and mobile wallets offer guests a fast and secure way to complete transactions, reducing the need for physical cash or credit cards (X. Cheng et al., 2023). This trend has been accelerated by the pandemic, which has increased the demand which further minimizes physical contact and ensures safety.VR and AR (Virtual and Augmented Reality) are also becoming influential in the hospitality industry (Lim et al., 2024). VR can provide immersive virtual tours of hotel properties, allowing potential guests to explore hotel and amenities before making a booking. AR overlays digital information onto the physical environment, like interactive maps or nearby attraction details.

This study reviews literature to identify possible research gaps in this area. It aims to contribute by analysing information and communication technology adoption theories, conducting bibliometric and network analysis,

and proposing future research questions. The study uses Web of Science databases and Scopus databases to collect articles, focusing on information technology adoption in hospitality. Articles from the past three decades were analysed by bibliometric methods to establish relationships through citation analysis. Challenges include ensuring comprehensive coverage from the citation databases. Nevertheless, research like this helps the hospitality sector evolve by studying current trends and new technologies and ensuring the industry stays adaptable to future challenges.

1.1. Background of the Study

The paper examines literature from the Web of Science database to guide future research in hospitality. The review extends beyond mere payment technologies (Dahiya et al.,2022), (Gulati et al., 2024) and tries to explore broader range of articles using bibliometric analysis. The hospitality industry is coming up with innovative approaches to attract and retain market share. These include virtual bookings, self-service technologies, robotics, and various payment options, including proprietary platforms for payments that essentially function as reward and loyalty programs (Sharma et al., 2018). As Nadkarni rightly said, transforming into digitization requires efforts from both technology and individuals (Nadkarni &Prügl, 2021) .

The integration of such technologies has streamlined operations and also significantly enhanced customer satisfaction and experience. Moreover, the application of Artificial intelligence has revolutionized the hospitality sector (Lim et al., 2024). AI-powered chatbots, for example, are widely used to handle customer inquiries, reservations, and even provide personalized recommendations. Chatbots use NLP (natural language processing) to interact with guests in real-time, offering immediate assistance and support (Pillai & Sivathanu, 2020).

Big data analytics helps hotels understand customer preferences and behaviors. By analyzing large datasets, they gain insights that allow them to tailor services and marketing strategies (Zarezadeh et al., 2022). This approach, which is data driven, helps in improving customer retention and loyalty by offering more personalized and targeted services. Additionally, blockchain is emerging as a secure method for managing transactions and records. In the hospitality industry, blockchain can be utilized for a range of applications, including secure payments, loyalty programs, and supply chain management (Lee et al., 2021). This ensures that all transactions are recorded in an immutable ledger, providing greater security and trust for the service providers as well as customers.

1.2. Research Questions

The motivation to conduct the study leads to the following questions for research:

RQ1: Major areas for future research in hospitality and technology. What theoretical lenses have been used to describe the adoption and use of various technologies in the segment?

RQ2: What holds the crucial aspect of technology integration in hospitality? Who are the top authors, leading journals, and main publishing elements in this area?

2. Research Methodology

On searching the citation databases, one thousand four hundred articles are extracted in the business and management research area. The growth of articles during the searched period, 2005-2025, is incremental. The Biblioshiny-R software package is used for analysis and Vos viewer networks were used for presenting results. Bibliometric analysis is a quantitative evaluation based on the similarity of articles and similar databases. The search was later refined by using specific keywords and by looking only at journal articles and review articles. The time frame was from 2005 to 2025, as per the databases.

2.1. Selection of the database: Keywords and other criteria for selection of articles

The integration and application of technology have been examined across various fields over time. Around 1400 articles on technology in the hospitality segment results from both WOS and Scopus. These articles can again be refined based on the subject criteria, focusing on research related to business management, commerce, and business finance. Additionally, exclusively research articles were selected from these areas. The study covers two decades, from 2005 to 2025.

Keywords were chosen for the search process in both databases, incorporating suitable synonyms and using "OR" Boolean operators and the process was based on the author's judgment. The keywords included combinations like "Adoption," "Technology adoption," "Adoption of technology," "Technology acceptance," "ICT," "information communications technology," and "hospitality industry." The articles while writing, were managed using Mendeley software, with duplicates being manually removed.

2.2. The steps in selection criteria:

The procedure developed by authors for researching articles is as follows in Table 1:

Step 1: Scrutinize and filter articles in the citation database using specific keywords.

Step 2: Identify and analyse critical research articles.

Step 3: Identify commonly used methods

Step 4: Identify key focus areas

Table 1: summarises these steps in the table.

Particulars of Search Criteria	
Documents	Research Article
Database	Web of Science. Scopus
Technique	Bibliometric Analysis
Tool used	Vos Viewer,R Studio;Bibliomerics
Article Collection	2005-2025

3. Results

This study looks at articles published from 2005 to 2025 on technology adoption in hospitality using bibliometric and in-depth analysis. The articles were selected from two citation databases, Scopus and WOS with specific keywords, and only journal articles and review articles were selected for the study. For scrutiny, these details are extracted from the search query in Table 2.

Table 2: Main statistics

MAIN INFORMATION ABOUT DATA	
Timespan	2005:2025
Sources (Journals)	272
Documents	1410
Average citations per doc	32

From the word cloud using author keywords from the selected literature it is clear that the hospitality segment is driven by technologies like AI, digitization, and other innovative technologies including blockchain. The word cloud in Figure 1 is created using the indexed keyword extracted from the articles, and the tool used is the R studio Biblioshiny package.

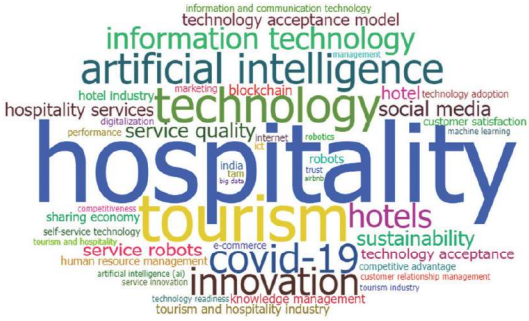

Figure 1: Word cloud

3.1. Top authors and keywords of hospitality research

The relevant authors in this field are detailed in Figure 2. Among them, Nicolau J stands out with approximately eighty four documents cited in both the citation databases. The country network map, created using Vos viewer, is depicted in Figure 3. This map showcases the collaborative relationships and contributions of various countries to this body of literature. Notably, twelve clusters are formed from the criteria used. Within these clusters, author Buhalis D is particularly prominent, having received 646 global citations on the subject.

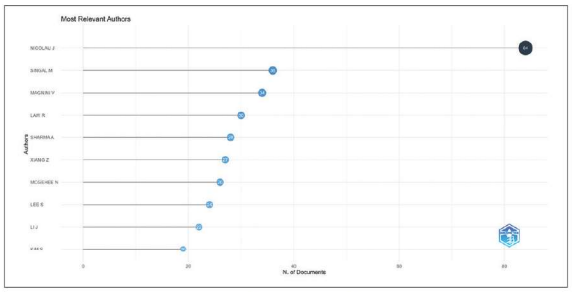

Figure 2: Top authors

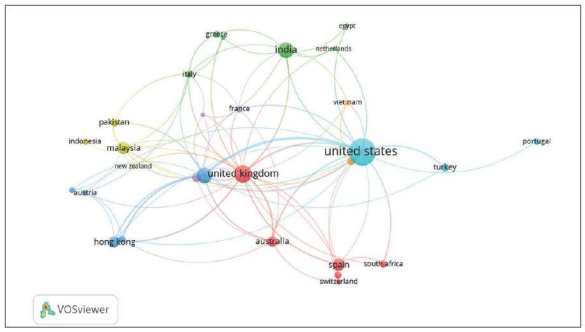

Figure 3: Countries network map of authors

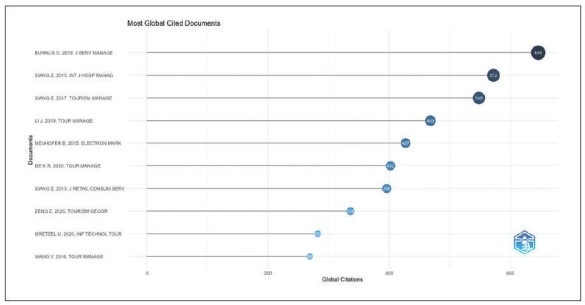

Figure 4: Total Citations(global)

Here, the United States contributes more to the literature with the highest number of documents and has a link strength of 19 other countries. There are 2315 keywords selected from the selected articles. The network diagram shows "adoption" as the main keyword in cluster one with 170 occurrences. Other significant keywords include "hospitality" from cluster one, "tourism" from cluster two, and "information technology" from cluster three.

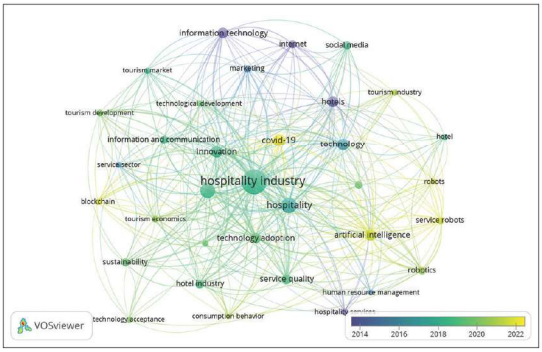

Figure 5: keywords map (network)

The keyword network map generated using the Biblioshiny package is depicted in Figure 6. It highlights the most relevant keywords in the field, such as "hospitality," "tourism," "services," "AI," "education," "experience," "customer satisfaction," among others. These keywords represent the core themes and focus areas in the hospitality segment, reflecting the current trends and technologies being adopted. The map provides a visual representation of how these keywords co-occur within the selected literature, offering insights into the interconnectedness of various research topics and the prominence of certain concepts.

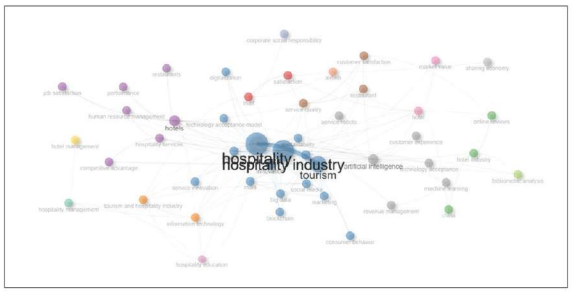

Figure 6: Keywords occurrence network

4. Discussion

In the bibliometric analysis, various facets such as the most influential country, notably the United States, are meticulously visualized. Authors contribute significantly to the expansive literature concerning technology adoption. For a comprehensive examination, forty articles were selected based on the judgment of the authors. These papers were further refined based on their inclusion in Web of Science journals with ABDC rankings. The search included publications from 2005 to 2025, covering two decades. Subsequently, key insights were incorporated into the paper as summarised in Table 3. Despite looking at articles spanning twenty years, there is a clear preference for recent publications from the last five years, ensuring the inclusion of modern developments and recent research agendas in the field. Structural equation modelling emerges as the predominant analytical tool among the selected articles. The target groups chosen for analysis include merchants, users, and consumers. Among these target groups, a subset of articles focuses on the firm's adoption of various technologies, while the remainder delves into the consumer aspect of technology adoption.

Table 3: Theoretical Perspectives of Selected Articles

Articles	Adoption - Customer / Merchant	Theoretical Framework
(Morosan, 2010)	Consumer	TAM In Biometric Systems
(Ozturk, 2016)	User	TAM In RFID Adoption of Users
(KAUSHIK & RAHMAN, 2015)	User	TAM
(Lim, 2009)	User	TAM
(Pateli et al., 2020)	Firm	DOI Theory and TOE Framework
(Sun Et Al., 2020)	Firm-Hotel Employees	TAM
(S. CHENG & CHO, 2010)	Firm-Hotel Employees	TAM

(MOROSAN & DEFRANCO, 2016B)	Firm-Merchants	UTAUT 2
(Khalilzadeh Et Al., 2017)	Consumer	Model- Tam& UTAUT
(Cobos Et Al., 2016)	Firm-Merchants	DOI Theory
(Horng Et Al., 2018)	Firm-Merchants	Decision-Making Trial and Evaluation Laboratory (DEMATEL)
(A. Huang Et Al., 2021)	Firm-Merchants	Qualitative& Quantitative
(H. Yang Et Al., 2021)	Consumer	TAM For Assessing TR and TA
(Hao, 2021)	User	UTAUT 2
(Mercan Et Al., 2021)	User	Review Paper
(HEIDENREICH & HANDRICH, 2015)	Customer	SEM
(Law Et Al., 2014)	User	Review Paper
(Liébana-Cabanillas Et Al., 2014)	User	TAM
(Kim Et Al., 2011)	Consumer	SEM
(Choe Et Al., 2021)	Firm-Merchants	TAM Merged With TPB
(Ip Et Al., 2011)	User	Review Paper
(Lu Et Al., 2015)	User	TAM
(Han Et Al., 2021)	User	Thematic Analysis
(EZZAOUIA & BULCHAND-GIDUMAL, 2020)	Firm-Merchants	Conceptual Model-Organizational and, Individual Characteristics, (PB)Perceived Benefits.
(Sharma Et Al., 2018)	User	ISM, Fussy MIMAC
(PUROHIT & ARORA, 2021)	Consumer	TAM
(Belanche Et Al., 2021)	Consumer	Attribution Theory
(F. X. Yang, 2013)	Consumer	TAM
(STYVÉN & WALLSTRÖM, 2017)	Firm-Merchants	Factor Analysis
(INVERSINI & MASIERO, 2014)	User	Empirical Model
(Sarmah Et Al., 2017)	Consumer	Qualitative-In-Depth Interview
(Adukaite Et Al., 2016)	User	Qualitative-In-Depth I (Morosan & Defranco, 2016a) PB
(MOROSAN & DEFRANCO, 2016A)	User	Review Paper

4.1. Customer operated technologies- QR menu, payments

Customer operated technologies are the "technological interfaces that enable customers to produce a service independent of direct service employee involvement" (Meuter et al., 2000). Works by Frehe and Teuteberg emphasized the importance of information technology for sharing information and the process of sharing the technology for the entire supply of materials and services over the network (Frehe & Teuteberg, 2017). A few references of transport, logistics, and other services utilising technology for sharing of information, is also found in available articles (Kim et al., 2011). The installation of such technologies viz. automated check-in/out, and individual-ordering systems by the hospitality industry affects consumer adoption behavior, which in-turn is influenced by extrinsic motivation.

T. Yang et al, conversely, pointed out how the system and quality of interpersonal service significantly impact the speed, effort and accuracy expectancies (T. Yang et al., 2020). A self-service innovative scale developed by Kaushik & Rahman (Kaushik & Rahman, 2016) helps using the scale across multiple industries. As per authors (Zhao et al., 2008), proper training and implementation strategies would help the users of technology to reduce technology anxiety and it also improves confidence and re-use intentions of mobile technologiesA three stage procedure for SST adoption including, adoption decision, implementation of SSTs, and acceptance of the technology, where implementation stage is affected by the task characteristics and rest of them are not is also available (Liu et al., 2019).

Further, the papers published on Self-service technologies in the hospitality segment is presented in Table 4.

Table 4: Hospitality segment and SST adoption

Authors	Theme of paper	Methodology	Theory
(Kim et al., 2011)	Adoption of SST by consumers. Results suggested on the influence of extrinsic motivation on adoption behaviour.	SEM	DOI and TAM
(T. Yang et al., 2020)	Factors affecting ordering using self-services in restaurant. SS Quality has significantly impacted by speed, effort and accuracy expectancy.	PLS analysis	UTAUT
(Kaushik & Rahman, 2016)	a scale development which measures the SST adoption.	Testing of scale in different context	scale developed-Self-service innovativeness

(Liu & Hung, 2021)	Multilevel adoption of SST technologies	In-depth interviews	Multilevel phenomenon of technology adoption
(Liu et al., 2019)	A three-stage process-adoption, implementation and acceptance of technology	Focus group discussion	
(Park et al., 2021)	Propose to establish a self-service technology House of Quality		Quality function deployment methodology

The pandemic significantly accelerated the technology use across various industries and sectors. Plentiful articles have been published over the past addressing the adoption of information technology. These explore the factors, both empirical and conceptual. A key focus of these publications has been on technology adoption, often discussed using Diffusion Theory, the Technology Adoption Model, and the Unified Theory of Acceptance and Use of Technology. In depth reading of articles highlighted that TAM and its modified forms were the most frequently used frameworks.

4.2. Artificial Intelligence and Robotics: The Pandemic

AI and robotics are becoming popular in the hospitality industry. The key factors driving the adoption of AI are customer satisfaction and maintaining a strong market position (Nam et al., 2021). From a commercial perspective in the hospitality industry, AI influences customer satisfaction, loyalty, and service quality (Prentice et al., 2020). Robotics in the service industry offers many benefits. Consumers use robotics for their convenience, functionality, and for the emotional connection they provide (Wirtz et al., 2018).

All these technologies in the hospitality segment have been influenced by customer satisfaction, loyalty, and service quality. AI technologies provide personalized experiences and streamline operations, enhancing overall customer experience. Similarly, robotics offer ease of use and utility, but their emotional and social elements also play a vital role in consumer acceptance.

Research trends in this field indicate a growing focus on AI and digitization, transitioning from traditional communication technologies. This shift is evident in the bibliographic package analysis conducted using R studio, which highlights the evolution of technology trends annually, starting from 2005. The growing use of AI and robotics in the hospitality sector highlights the necessity of adopting advanced technologies to meet customer expectations and sustain a competitive edge. As AI technology advances, its applications will revolutionize service delivery, making it both efficient and emotionally engaging for consumers.

Hence, this brings about the top trend topics for research in this field. The trend topics are developed from the selected articles using the bibliographic package in R studio. The changeover from communication technologies to AI and digitization is shown over two decades, demonstrating the technological integration.The topics of research have shifted significantly, highlighting various aspects such as the internet, digital systems, and AI. Earlier, the focus was primarily on these technologies and their effects on the hospitality sector. Over the years, as digital transformation took hold, newer themes like blockchain, AI, and digital avatars began to emerge. By the mid-2020s, the focus expanded to include generative AI and the metaverse, illustrating a growing interest in advanced technologies and their potential to revolutionize the industry. The words that frequently appear in trend topics from 2005 to 2025 include: hospitality, internet, theory, digital, AI, blockchain, integration of technologies, avatar, generative AI, and metaverse. These evolving themes show the industry's adaptation to new technological advancements and underline the importance of continuous innovation to meet customer expectations and maintain competitive market positions.

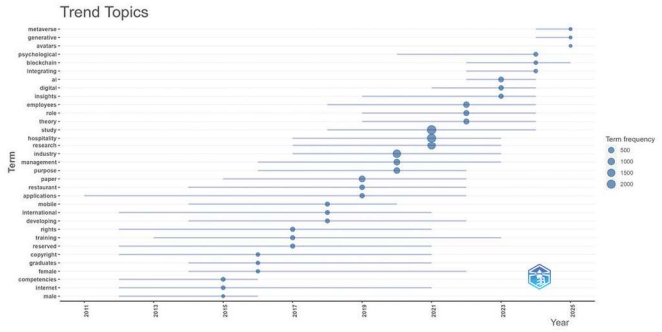

Figure 7: Trend topics for research

The figure starts from 2004 in the x-axis, which shows the Internet and other communication technologies.

4.3. Popular Theories Used in Hospitality Segment Research

Table 5 shows the recent articles which adopted various technology adoption theories for studying the phenomenon.

Table 5: Top theories

Innovation - adoption theories (Author)	hospitality articles
Diffusion of innovation Everett Rogers (1962)	(Alexander & Kent, 2021)
Theory of Planned Behaviour Icek Ajzen (1985)	(Kureshi & Thomas, 2019)
Expectation confirmation theory Richard L. Oliver (1977)	(Nascimento et al., 2018)

Technology acceptance model (TAM) Davis (1989)	(Kaushik and Rahman, 2016,)
Task technology Fit Goodhue and Thompson (1995)	(Wang et al., 2021)
Unified theory of acceptance and use of technology Venkatesh (2003)	(Giovanis et al., 2019)
UTAUT2 Venkatesh (2012)	(Christino et al., 2019)

In summary, after a detailed scrutiny and bibliometric analysis, authors put forward four areas for future research direction but not limiting to only these are as per table 6.

Table 6: Future Scope in hospitality Research

Topic	Description
Phygital Tourism Experiences	Frameworks to measure impact on tourist satisfaction and engagement, AI for personalized journeys, integration of Augmented and Virtual Reality in cultural heritage tourism, role of IoT in smart tourism
Sustainable (and Responsible) Tourism	Following a "technology for sustainable practices", empowering local communities, ethical concerns with respect to data collection, managing over-tourism through technology
Experiential and Transformative Tourism	Such as immersive storytelling, enhancing wellness tourism, incorporating gamification and AI to foster emotional connections with destinations
Accessibility and Inclusivity	Role of technology in making tourism accessible for specially abled individuals, promoting cultural sensitivity, facilitating communication through real-time translation

Frameworks to measure impact on tourist satisfaction and engagement includes: use of AI for personalized journeys, integration of AR/VR in heritage tourism, and IoT in smart tourism. Additionally, technology can also be used to ensure sustainability, empowering local communities through tech, addressing ethical scope around data collection, and leveraging technology to manage and mitigate over-tourism. Implementing technology can also make tourism accessible for specially abled individuals, ensure cultural sensitivity and inclusivity, and enhance communication through real-time translation tools. It is also crucial to explore how modern technological advancements like AI and IoT are revolutionizing the hospitality industry by enhancing guest experiences and boosting operational efficiency.

5. Conclusion, Directions and Proposition for future research

The authors in the paper affirmed the significance of technology in the hospitality segment and identified future research directions in the area. The most dominant research areas in the hospitality industry are AI-enabled hosting, technologically enabled self-services, and robotics. There are, however, apprehensions about the hospitality industry's need for more human touch and intervention. Technology has endorsed the area of hospitality to enhance customer experiences. This is the most crucial theme the authors put forward for future research. A comprehensive study of consumers' behavior concerning age emphasizes the same for further studies (Zniva & Weitzl, 2017). The sharing economy has led to new accommodation options like Airbnb and Vrbo. This has significantly impacted the traditional hotel industry, and it is essential to research how hotels can adapt to this new area. People are increasingly interested in staying in hotels that are committed to sustainability. Hotels must find ways to check and reduce their environmental impact, such as using renewable energy and recycling. Furthermore, there is potential for future research in conducting a comparative study of technological adoption theories. The selected database, Web of Science, includes research articles starting from the year 1989. Consequently, expanding the database might impact the number of citations. Lopes et al's work is another bibliometric study of omnichannel marketing concerning merchant strategies and consumer experience (Lopes et al., 2021). Therefore, future bibliographic studies may focus on other aspects of hospitality and hold future research. Also, more reports from other open databases will be covered to evaluate and appreciably contribute to future research in this area. In conclusion, modern technologies are reshaping the hospitality industry, offering new opportunities for enhancing customer and service experiences, improving operational efficiencies, and staying competitive in a rapidly evolving market (Horng et al., 2018). The hospitality industry must embrace new technologies to meet modern travellers' expectations.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

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Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study. The data used is published literature and is available in the citation database Web of Science and Scopus.

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