

Mapping innovation hubs and smart cities in tourism: A bibliometric analysis



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Abstract Innovation Hubs (IH) have become fundamental for the development of Smart Cities (SC). These environments, both physical and virtual, promote collaboration between various agents and foster innovation and the creation of technological solutions to improve the quality of life of the population. This research seeks to provide a solid base of knowledge through a bibliometric and content analysis on IH and SC in the tourism field, thus identifying opportunities for theoretical and empirical development. To achieve this, a rigorous protocol based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology, version 2020, was followed. It comprises four phases: identification, screening, eligibility, and inclusion. The search was carried out in the Scopus database without period restriction and 227 documents were obtained. After applying inclusion and exclusion criteria, 55 articles were analyzed. The results show a clear advance in research on IH and SC in tourism, with significant growth since 2017 and constant production in recent years. The countries and authors with the greatest academic contribution were also identified; Spain, Italy, and China stand out as leaders in the field. In addition, through keyword co-occurrence analysis, thematic clusters linked to innovation, sustainability, and digitization in smart tourism were determined. Despite these advances, the joint study of IH and SC in the tourism context remains limited, so it is necessary to deepen this field to continue enriching theoretical and empirical knowledge.

Keywords: innovation hubs, smart cities, smart tourism, innovation, systematic literature review

1. Introduction

Innovation hubs (IHs) have been established as sources of change in different economic sectors; they bring together a diversity of stakeholders from entrepreneurs to government institutions to promote innovative processes. These spaces, both physical and virtual, foster collaborative environments that favor the exchange of knowledge, access to emerging technologies, and the availability of strategic resources such as infrastructure and support networks (Hardy et al., 2018; Friederici, 2018). In the tourism sector, IHs have emerged as platforms for the development of innovative solutions by facilitating articulation among multiple agents seeking to improve visitors' experience and optimize the services offered (Paredes et al., 2021; Prieto et al., 2019; Nnanna et al., 2023; Marchesani et al., 2024).

Although IHs have proven effective in the development and transformation of various sectors, including tourism, they face challenges related to the sustainability of their model and the equitable distribution of the benefits generated (Rikap & Flacher, 2020; Van der Maarel et al., 2023). Therefore, in the construction of a more innovative and sustainable future of tourism, the synergy between innovation hubs and smart cities enhances the ability of tourist destinations to respond to these contemporary challenges, contributing to the creation of more attractive, inclusive, and sustainable experiences.

In this context, literature reviews indicate that several authors agree on the importance of these spaces to promote collaboration, technological innovation and sustainable practices, thus improving the tourist experience and the competitiveness of destinations. Sassanelli et al. (2021) and Dedehayir et al. (2018) advocated expanding the service model of IHs to address the challenges of digital transformation and innovation in tourism. They propose the integration of new dimensions and the identification of emerging roles to turn them into centers of integral and collaborative innovation, since currently, contributing to the Sustainable Development Goals is a challenge faced by tourist destinations globally (Velázquez et al., 2022).

There are various problems related to tourism; although accelerated growth has been reported in multiple cities, evidence of a lack of territorial planning, gentrification and the problems it has caused in terms of water, energy, and waste is also evident (Plumed et al., 2018). Moreover, digital transformation in the tourism sector is urgently needed in the face of growing competition and rapid changes in tourism structures, processes, and products; however, meeting the diverse



expectations of customers and society is even more complex (Guzakov et al., 2020). Therefore, the importance of hubs in solving these problems is decisive since, as noted by He (2020) and Jakovljevic et al. (2021), hubs facilitate collaboration and integration for the development of smart cities.

Casado-Aranda et al. (2021) highlighted that the adoption of advanced technologies contributes to the construction of smart cities. In tourism, the use of robots and artificial intelligence technologies in hotels and other services allows tourists to interact safely and comfortably. The adoption of online platforms, social media, and digital tools such as flow management facilitates the mobility of tourists, thus improving their safety and experience in general. Therefore, the need to continue strengthening IHs to promote intersectoral collaboration and foster innovation and sustainable development in smart cities dedicated to tourism is highlighted.

This research seeks to provide a solid base of knowledge through a bibliometric analysis of the IH and SC by identifying opportunities for theoretical and empirical development in the tourism field. Bibliometric analysis enables the identification of publication and collaboration patterns that reveal underexplored and emerging thematic areas in the literature (Donthu et al., 2021). Moreover, its systematic application facilitates the quantification of conceptual trends and the evolutionary mapping of knowledge, thereby contributing to the detection of research gaps with objectivity and methodological rigor (Aria & Cuccurullo, 2017). Therefore, this approach represents an ideal method to guide future research toward niches that remain insufficiently studied. The document has the following structure: after this introduction, the methodology followed to conduct the literature review is presented; then, the results are divided into two sections: bibliometric analysis and content analysis. The paper ends with a discussion and conclusions.

2. Materials and methods

This research performs a bibliometric and content analysis through the systematic process established by the *Preferred Reporting Items for Systematic reviews and Meta-Analyses* (PRISMA) methodology, version 2020, which integrates four stages of verification: identification, screening, eligibility, and inclusion (see Figure 1). The first stage consisted of a search in the Scopus database using the words "innovation hub", "tourism" and "smart city" and their possible synonyms to generate the equation. As it was an emerging issue, no period was filtered, and 227 documents were obtained (see Table 1).

Table 1 Search equation.

Search equation	Result
(TITLE-ABS-KEY ("innovation hub") OR TITLE-ABS-KEY ("Innovation center") OR TITLE-ABS-KEY ("Innovation hotspot") OR TITLE-ABS-KEY ("Innovation ecosystem") OR TITLE-ABS-KEY ("Innovation Lab") OR TITLE-ABS-KEY ("Center for Innovation") OR TITLE-ABS-KEY ("Creative Hub") OR TITLE-ABS-KEY ("Venture Lab") OR TITLE-ABS-KEY (innovation) AND TITLE-ABS-KEY (tourism) OR TITLE-ABS-KEY ("hospitality industry") OR TITLE-ABS-KEY ("tourist") OR TITLE-ABS-KEY ("hotel industry") OR TITLE-ABS-KEY (hotel*) OR TITLE-ABS-KEY (ecotourism) AND TITLE-ABS-KEY ("smart cities") OR TITLE-ABS-KEY ("smart city") OR TITLE-ABS-KEY ("smart destination") OR TITLE-ABS-KEY ("Intelligent cities") OR TITLE-ABS-KEY ("Digital cities") OR TITLE-ABS-KEY ("Innovative cities"))	227

In the second stage, inclusion and exclusion criteria were applied. Participants in congresses, conferences, book chapters, letters to the editor, and reviews were discarded, leaving only articles. Documents with open access were considered an inclusion criterion. Once the titles and summaries of each article were reviewed, those that had thematic relevance were included; after filtering by full-text examination, 55 articles were obtained and analyzed in detail (see Figure 1).

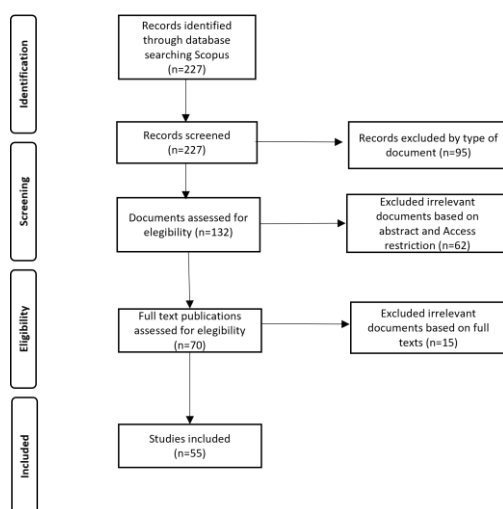


Figure 1 PRISMA graphics.



The bibliometric phase allowed us to understand the behavior of scientific production around the subject over the years to identify the geographical distribution of knowledge and experts on the subject (Zupic and Cater, 2015). For data treatment, maps based on network graphs were created with VOSviewer software version 1.6.5 (Van-Eck & Waltman, 2011; 2014).

3. Results

3.1. Bibliometric analysis

The production of scientific documents on innovation hubs and smart cities related to tourism is scarce; only 227 publications were found in the last 14 years. As shown in Figure 2, the first contributions appear from 2012 onward, a growth in scientific research has been observed since 2017, and there has been relatively constant and incremental production in the last three years (2021-2024), which represents 49% of total publications.

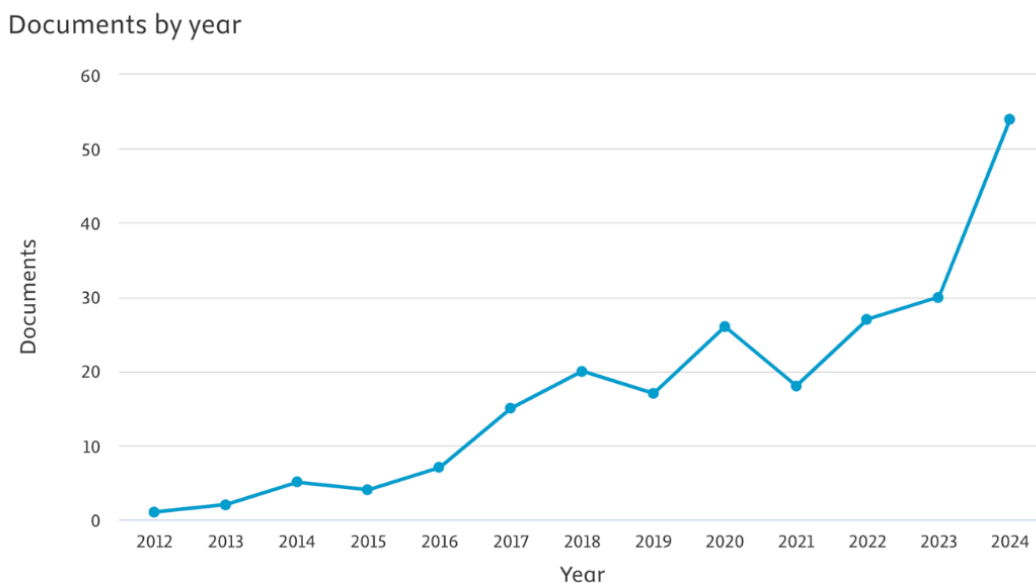


Figure 2 Articles published per year (2012-2024).

Table 2 shows the production of documents by country and by author. The literature on these topics is concentrated in three main countries: Spain, Italy, and China. They stand out for their high level of research and development in the field of innovation hubs related to smart cities (SCs) and tourism. Spain leads with 28 publications, followed by Italy and China. This indicates a distribution of knowledge in various countries. As has been observed in other areas, China is also making progress in this area of study. Likewise, the most influential authors on the subject were identified, for instance, Dimitrios Buhalis and Mariapina Trunfio, who contributed five and three publications, respectively. Other outstanding authors with two articles each can be seen in Table 2, which highlights them as main references, evidencing their academic influence and intellectual leadership in the matter.

Table 2 Number of documents by country (top positions).

Documents by country		Documents by author	
Country	Number of articles	Author	Number of articles
Spain	28	Buhalis, D.	5
Italy	27	Trunfio, M.	3
China	26	Baños-Pino, J.F.	2
India	15	Gretzel, U.	2
Portugal	15	Ivars Baidal, J.A.	2
United Kingdom	13	Joime, G.P.	2
United States	10	Pahuja, N.	2
Indonesia	9	Pasquinelli, C.	2
Russian Federation	7	Salvati, L.	2
Austria	6	Vardopoulos, I.	2
Brazil	6	Xiang, Z.	2
Greece	6	Zhang, J.	2
South Korea	6		
Australia	5		



Table 3 The seven Clusters.

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7
Innovation	Smart Tourism	Internet of Things	Smart Cities	Smart City	Bibliometric Analysis	Urban Growth
Smart Destination	Tourism	Smart Tourism Destination	Big Data	Tourism Development	Digitalization	Urban development
Sustainability	Technology	Governance	Artificial Intelligence	Tourism Industry	Smart Tourist Destination	
Sustainable Development	Smart Destinations	IoT	Information Management	Smart Technology	Students	
Tourist Destination	Tourism Innovation	Planning	Digital Transformation	Difference-In-Differences Model		
Tourism Management	Tourist Destinations	Blockchain	Marketing	Knowledge		
Covid-19 Ecotourism	Destination E-Tourism	Industry 4.0 Intelligent Systems	Data Mining Electronic Commerce	Living Lab		
Sustainable Tourism	Competitiveness	Open Data				
Technological Development	Destination Management	Regional Development				
Urban Planning	Hospitality Industry					
Augmented Reality						
Governance Approach						
Tourist Behavior						

The thematic map organizes key concepts according to two dimensions: the X axis of centrality indicates the relevance of the topics in the general domain of this study, and the Y axis of density represents the degree of development of these topics (Figure 6). The quadrant analysis indicates that smart cities, tourism, and sustainable development are in the upper right quadrant; therefore, they are highly relevant for the fields of tourism and smart cities. While smart tourism, the tourism industry, and big data are at the basic level (lower right quadrant). Although they are essential, they may not be at the forefront of innovation but may serve as a benchmark.

In the upper left quadrant are the topics called niches, identifying urban environments, digital technologies and heritage, with advanced development but with limited impact in the general field of tourism. The mention of heritage indicates that a part of the research focuses on how digital technologies impact heritage conservation in tourism contexts. The lower left quadrant shows emerging or declining issues; personalized tourism, development strategies, open innovation, and embedded systems have low relevance in the global structure of research because they are emerging areas that have not yet reached a consolidated state.

At the center of the map, there is a group of evolving topics, such as innovation, tourism development, and tourist destinations, indicating that these areas are in transition and may become driving issues in the future. The presence of 5G, robotics and communication systems suggests that emerging technologies are beginning to be explored within smart tourism, although they are not yet fully developed. Bibliometric and urban planning appear in a central position but with less development, indicating that these methodological approaches are being used to better understand the evolution of smart tourism and its urban impact.

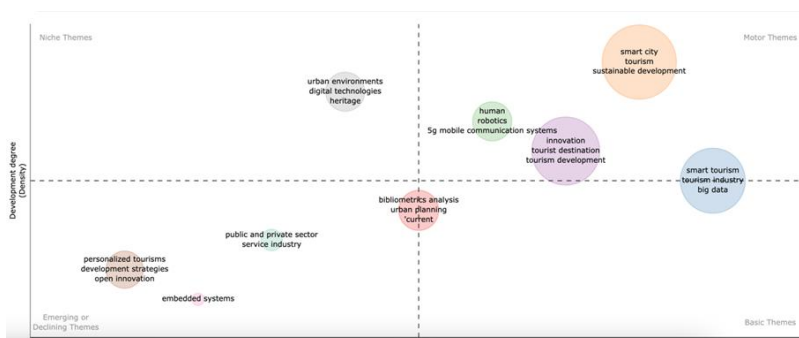


Figure 6 Thematic map.



3.2. Content analysis

3.2.1. Role of innovation hubs

Innovation hubs (IHs) are considered elements of change that drive development in various sectors, including tourism. These physical or virtual spaces bring together a diverse community of stakeholders, including entrepreneurs and companies seeking new technologies, universities and research institutions to expand their knowledge and experiences, and governments that facilitate financial and regulatory support for innovation (Hardy et al., 2018; Friederici, 2018). IHs operate as dynamic ecosystems that promote collaboration, the exchange of knowledge, and access to resources. Likewise, as work spaces, they develop capacities through training, mentoring and professional support, generating a positive impact in various sectors by stimulating the creation of new companies; promoting the transfer of technology; increasing competitiveness; and improving the quality of life of the population by applying innovation to areas such as health, education and the environment (Friederici, 2018; Hardy et al., 2018; Herron and Wolfe, 2021; Kencono et al., 2024).

Studies such as that of Friederici (2018) exemplify the potential of IHs to connect with various stakeholders in the African entrepreneurial ecosystem. Others, such as Hardy et al. (2018), propose the "popular academy" as a model of innovation focused on inclusion, collaborative work and pedagogical innovation. Herron and Wolfe (2021) examine the role of IHs in university environments, showing their applicability in different areas, such as teaching, study programs and research. In this context, the work of Björklund et al. (2019) analyzes how design factories are IHs for cocreation, enabling learning and knowledge transfer in universities. Its impact ranges from education and engineering to entrepreneurship, design and the formulation of public policies.

In addition, their flexibility and openness to various disciplines make them agents for innovation in higher education and society in general (Montash et al., 2025). Therefore, IHs represent much more than mere physical space; they constitute virtual networks that bring together various stakeholders to promote the exchange of knowledge. As Braret al. (2023) point out, IHs' main objective is to promote technological and business innovation, but they are also oriented toward the creation of knowledge centers committed to the community and sustainability.

IHs have allowed public universities to position themselves as active participants in the business field (Nnanna et al., 2024). In this context, Bojmirova (2022) analyzes the relevance of IHs in the regulation of fintech, allowing them to test new financial products in controlled environments that guarantee consumer safety. This involves integrating diverse disciplines by connecting universities, industries, governments, and other stakeholders in an urban ecosystem. Government policies that promote fintech innovation favor the creation or strengthening of centers where startups and financial institutions collaborate for the benefit of society and markets (Barcia, 2021).

An example of an IH to develop innovative scientific and business research solutions in the climate, water, sanitation, hygiene, and climate change sectors is the study by Ayasrah and Hanandeh (2024) in Jordan, which mentions that public-private collaboration was one of the central elements to achieve it. There must indeed be a political, regulatory and financing framework to implement innovation through public-private partnerships and achieve effective results (Sikombe et al., 2024).

The same happens with intersectoral IHs, where traditional industries collaborate with technological startups and creative companies, focusing on training and coaching programs. Promoted consulting networks help in financial training that allows the design of projects in creative industries, thus facilitating the mobility of talent, linking companies, promoting innovation, and contributing to the creation of new companies (Shen et al., 2025).

Similarly, Jiménez and Zheng (2021) study IHs from an inclusive approach, highlighting their ability to empower diverse people, value individual resources, and encourage cocreation and social innovation. In this vein, Brar et al. (2023) highlight their role as drivers of social change and innovative development, adapted to community needs, whereas other authors underline their innovative potential in the tourism sector, improving cultural and tourist experiences (Paredes et al., 2021; Prieto et al., 2019; Nnanna et al., 2023; Marchesani et al., 2024).

However, in the search for sustainability in the tourism and hotel sector, IHs are also a model for stimulating innovation in corporate social responsibility (CSR) (Cigir, 2018). Through this approach, several key ideas about IHs are explored, e.g., their application in tourism and hospitality, focus on cocreation, promotion of open innovation, and importance as living lab models.

IHs also contribute to improving the sustainability of short food chains and directly connecting producers and consumers to reduce their environmental impact (Chrysanthopoulou et al., 2022). They show how the use of information and communication technologies has promoted sustainability, optimized the supply chain and reduced the carbon footprint.

IHs are a new and promising way to promote innovation in rural areas. However, research in this field is still at a preliminary stage. The literature does not provide a clear definition or a systematic description of the functions and types of these centers (Duchek & Höne, 2024).

3.2.2. Innovation hubs and smart cities

Innovation is closely related to both the economic profitability and sociocultural development of cities; therefore, Chowdhury et al. (2023) indicate that IHs must constitute regional clusters to support buyers, promoters, and creators and

thus generate socioeconomic impacts on the progress of populations. Some governments have instrumentalized the idea of cities as centers of innovation in their search for economic competitiveness and governance to address global sustainable challenges effectively (Chou et al., 2024; Remneland and Styhre, 2023; Sassanelli and Terzi, 2022); promoting resilient, inclusive and diverse urban environments (Tricarico, 2024). However, communities still face challenges such as the equitable distribution of benefits, responsible management, and transparent communication, which are essential to guarantee long-term success (Rikap and Flacher, 2020; Van der Maarel et al., 2023). In this context, Brandajs and Russo (2023) invite us to reflect on the dark side of smart city initiatives, while these actions promise a more efficient and technologically advanced city, they may also exacerbate social gaps and lead to less fair destinations.

Other lines of research address how cities are conceived as global innovation hubs to attract and retain talent, facing issues such as the aging of the workforce; additionally, they can obtain economic benefits through service networks and digital technologies detached from innovation (Belderbos et al., 2022). In this context, Chou et al. (2024) analyze the role played by the regional collaboration of the government and companies in four cities, Copenhagen, Amsterdam, Singapore, and Hong Kong, to understand their vision of innovation and future governance for their transformation into smart cities.

Following new discoveries in Brazilian cities that seek to position themselves as smart cities, Fachinelli et al. (2023) provide a novel and adapted evaluation framework to measure the intelligence of 27 locations through productivity and innovation, livability and well-being, sustainability and accessibility, governance and planning, and digital connectivity and innovation. Their findings show that leading cities have common factors such as a strong innovative ecosystem, specific policies to support entrepreneurship, training programs for qualified workers, and a clear focus on knowledge-based development and digital transformation. They also point to challenges such as deficits in digital literacy and unequal access to technology, which implies the adoption of local regulations that favor the creation of technological ecosystems and cooperation between the public, private, and academic sectors.

Another important contribution focuses on the sustainable development of cities since they integrate technology and knowledge in urban planning and promote a more diversified, inclusive, and environmentally friendly economy (Yigitcanlar et al., 2020). In this case, IHs are usually oriented toward the development of technologies that improve environmental sustainability, such as renewable energy, energy efficiency, and solutions for waste and water management, improving the quality of urban life. In addition, they promote collaboration among different sectors of society, thus improving social cohesion and contributing to inclusive development. Therefore, the creation of technology parks, incubators, and collaboration networks between universities, technology companies, and the government has contributed to economic development on the basis of knowledge and innovation, which has been essential for successful city transformation (Yigitcanlar et al., 2020).

Benedict (2022) focused on improving the intelligence of shared mobility via blockchain technology in smart cities, indirectly contributing to the concept of a smart city.

Hence, there is a clear relationship between IHs and smart cities since both seek to create environments conducive to collaborative innovation and sustainable development through the integration of various perspectives and skills in an urban context. IHs not only act as platforms for the exchange of ideas and knowledge but are also fundamental in the creation of smart cities. Through collaboration and shared learning, these hubs can help address the challenges of urbanization and promote sustainable development. The synergy between the two concepts is vital for building more resilient cities adapted to the needs of the future.

3.2.3. Smart cities and tourism

The study of smart tourism cities is becoming increasingly relevant since innovation plays a key role in technology and data management to improve the tourist experience and promote long-term sustainability (Belli et al., 2020). In the search for this transformation, various studies and projects have emerged that address different key aspects. On the one hand, the importance of technology in the management of tourist flows is highlighted, improving traveler experiences and the efficiency of attractions (Atanasio et al., 2022). On the other hand, facilitating more sustainable urban management with complete, updated, and personalized tourist information systems (Ma, 2020).

Thus, sustainability and digitalization are current research topics, ranging from urban ecological development (Fang, 2023) to digital accessibility (Briciuet al., 2020; Fernández-Díaz et al., 2023). In the context of a sustainable future, the concept of smart tourism is proposed as an alternative strategy for smart cities. Several authors argue that smart tourism can help minimize negative environmental impacts and preserve the local culture; this includes the use of technology to reduce the consumption of resources and support sustainable practices in tourism infrastructures, in addition to improving access to cultural information and promoting a greater appreciation of the local identity by creating a destination brand, even in rural areas (Abakarim et al., 2024; Dabeedooal et al., 2019; Sustacha et al., 2024).

Intelligent traffic management systems are also considered key factors in creating sustainable leisure and tourism environments, as suggested in the work of Lin et al. (2022). The importance of technologies to reduce congestion, minimize carbon emissions, and promote a healthy urban environment, which is decisive for green tourism, is identified. In this context, Banet (2021) developed smart tourism strategies through mobility.

The advancement of smart cities and their integration with tourism has led to the concept of smart tourist destinations (STDs). Bussador et al. (2023) use a reference framework to evaluate and transform tourist destinations through sustainability, technology, and governance indicators. This allows public managers to implement more informed policies that optimize resource use and encourage balanced tourism growth. However, to ensure inclusive and resilient development, collaboration between the public and private sectors is essential, as is the participation of the community (Savan et al., 2024).

In this sense, Ndou et al. (2023) noted that, to build a smart tourist destination, strengthening the collaboration between local and national stakeholders, improving the ICT infrastructure, and adopting advanced digital practices are essential. Since many operators prefer traditional methods, which limit interaction with customers, proactively making it difficult to cocreate experiences. However, turning a city into a smart tourist destination requires designing strategies involving all stakeholders, such as the providers of tourist services (hotels, tourist offices, historical sites, and transport, among others). Bazazo and Alanazeh (2022) highlight the adoption of digital data networks; geographic information systems that facilitate optimal management of urban resources and services; and technologies such as Wi-Fi, Bluetooth, and reversible devices for the intelligent management of resources to ensure that the city can effectively respond to the demands of tourists and residents.

The adoption of technologies to build smart cities dominates much of the scientific literature in the field of tourism. Studies explore how the Internet of Things (IoT), artificial intelligence (AI), big data and connectivity are improving tourism management, the personalization of services and sustainability in smart destinations (Buhalis et al., 2023; Franco et al., 2024). The integration of technologies plus a collaborative approach enhances sector competitiveness and promotes more balanced and sustainable development (Baldi et al., 2022; Zhang, 2024). One of the greatest challenges for smart tourism is the lack of technological infrastructure; thus, to strengthen local economies and increase environmentally friendly consumption experiences, technologies contribute to making smart cities more sustainable, resilient, and attractive, which value authentic local experiences (Chrysanthopoulou et al., 2022).

A contribution to the understanding of smart cities concerns tools such as deep learning, which allows tour planners to develop alternative itineraries in the case of unforeseen events, enabling other opportunities for mass tourism, such as cruises when they visit short-term destinations (Di Napoli et al., 2022). A similar study is that of Kotis et al. (2022), which highlights the importance of optimal planning for ecological, intelligent, and semantically enriched cultural tours. Like other works, the purpose is to strengthen the tourist experience under a scientific and social approach, which will allow, through strategies such as the introduction of smart tourism methodologies and policies, the promotion of training in tourism management.

In this context, the development of smart cities is supported by the number of smart tourism industries linked to a destination, such as air transport, restaurant and accommodation services, and cultural, sports, and entertainment services (Lee and Hlee, 2021). In that sense, it was shown that the tourism industry has relatively low production effects, but it is a sector that requires soft technologies to promote organizational innovation and adaptation to the changing needs of today's tourists. Therefore, the main challenge of the industry is to use technologies intelligently, ensuring that they do not replace the concept of hospitality or the exceptional services that humans can offer (Liasidou & Pipyros, 2025).

4. Discussion

Innovation Hubs (IHs) are generally conceived in the literature as structured ecosystems that integrate various stakeholders (universities, companies, governments, social organizations and entrepreneurs, among others), to promote collaborative innovation processes. They function as dynamic platforms that facilitate the exchange of knowledge, co-creation, technology transfer, and capacity development, promoting sustainable solutions to complex problems in different economic sectors, such as tourism.

Despite the above, the literature still presents theoretical and methodological gaps. There is no consensus definition or sufficient applied cases, which limits its comparative analysis. However, the findings allow us to understand the role they play in innovation through the implementation of advanced digital technologies, facilitating the transition toward more efficient and sustainable urban models. From this perspective, sustainability is proposed as a key objective for smart tourism cities, a context in which IHs play a fundamental role by promoting innovation and the efficient use of technologies (Yaghmaie & Vanhaverbeke, 2020). However, this transformation presents significant challenges related to social inclusion, equity in access to technological benefits, and the need for clear regulatory and political frameworks that ensure transparent and effective governance for the development of destinations, as proposed by Buhalis et al. (2023) and Hardy et al. (2018). The greatest benefit involves various groups or sectors in the innovation process, so synergies are generated through participation to make decisions and solve problems in a more effective way.

Paredes et al. (2021) and Prieto et al. (2019) agree that IHs promote the creation of networks and communities through collaborative projects that link entrepreneurs with investors and various sources of financing. In that sense, IHs have a marked application in the educational field; however, these results differ from what was indicated by Nnanna et al. (2023), whose study primarily highlights the public value of said innovation centers in university contexts, whereas Herron and Wolfe (2021) emphasize their role as support for teaching.

Other authors also show how innovation in IHs influences the progress of SCs in the context of tourism. Andersson and James (2018) reveal a growing interest in understanding how innovation and technology influence the tourism experience in

smart urban environments. The findings of studies such as that of Belli et al. (2020) highlight the importance of technology in the management of tourist flows in smart cities, emphasizing the relevance of IHs at the intersection with SCs and tourism. Buhalis et al. (2023) emphasize that these topics offer a window into key areas of research, exploring the relationships among innovation, technology and tourism in the context of smart cities.

This research is hampered by limitations, primarily linked to the exclusive use of the Scopus database and the omission of academic sources such as doctoral theses, monographs, and other relevant publications. Consequently, future studies should extend their scope to the Ibero-American context, as the review reveals that most research is concentrated in Spain. Likewise, it would be advisable to include searches in additional databases—such as Web of Science, SciELO, and Redalyc—to bring in more diverse perspectives. Finally, incorporating documents published in languages other than English is recommended to enrich the understanding of the topic across different settings.

5. Conclusions

This study highlights the critical role that Innovation Hubs play in promoting sustainable innovation, particularly in the development of smart tourism cities. By fostering collaboration, knowledge transfer, and stakeholder integration, IHs contribute to the design of solutions that address complex challenges in sectors such as education, tourism, and urban development.

However, the transformation also poses significant challenges, especially regarding social inclusion, equitable access to technological benefits, and the creation of transparent regulatory and governance frameworks (Buhalis et al., 2023; Hardy et al., 2018). The involvement of multiple groups and sectors in innovation processes remains one of the greatest benefits, as it enables the generation of synergies that improve participation, decision-making, and problem-solving.

Additionally, IHs have proven relevant in building networks that connect entrepreneurs, investors, and institutions (Paredes et al., 2021; Prieto et al., 2019), and their applications extend notably to the educational context, although with differences in emphasis according to recent studies (Nnanna et al., 2023; Herron & Wolfe, 2021). In tourism and smart cities, their importance is reinforced by the management of flows and the enhancement of urban experiences through technology (Andersson & James, 2018; Belli et al., 2020; Buhalis et al., 2023).

Future research should expand beyond the current geographic concentration in Spain, incorporating Ibero-American perspectives and including additional databases such as Web of Science, SciELO, and Redalyc. Likewise, considering academic contributions in languages other than English would enrich comparative analyses and strengthen the understanding of IHs in diverse contexts.

6. Future research directions

Future research on innovation hubs (IHs) and smart cities (SCs) in the tourism context could focus on developing technological solutions that not only optimize the tourist experience but also promote inclusion and sustainability by fostering the cocreation of virtuous cycles between technological and social innovations. In this context, it is essential to continue exploring and enhancing the value chain built around data, information, and knowledge to establish a constant feedback loop among citizens, tourists, and developers. This would ensure that technological innovations respond to social demands and contribute to more equitable and sustainable urban development.

Ethical considerations

Not applicable.

Conflict of Interest

The authors declare no conflicts of interest.

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