

## Research trends in the dynamics of digital transformation in the tourism sector

Alejandro Valencia-Arias <sup>1</sup> , Carlos Augusto Puerta Gil <sup>2</sup> , Wilmer Londoño-Celis <sup>3</sup> ,  
Sebastián Cardona-Acevedo <sup>3</sup> , Maria Camila Bermeo-Giraldo <sup>4</sup> , Juan Camilo Rua  
Hernandez <sup>3</sup> 

<sup>1</sup> University of Los Lagos, Colombia

<sup>2</sup> Faculty of Humanities and Ecclesiastical Sciences, Colombia

<sup>3</sup> Faculty of Economic and Administrative Sciences, Colombia

<sup>4</sup> Escolme Research Center, Colombia

**Corresponding author:** Alejandro Valencia-Arias | [javalenciar@gmail.com](mailto:javalenciar@gmail.com)

**ORCID** <https://orcid.org/0000-0001-9434-6923>

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### ABSTRACT

Digital transformation in the tourism sector is defined as a strategic process that integrates emerging technologies such as artificial intelligence, big data, and the Internet of Things to optimise the customer experience, improve operational efficiency, and strengthen competitiveness. This reconfiguration of management and consumption of services is facilitated by data-driven models and smart ecosystems. Nevertheless, the augmentation of scientific production has resulted in the establishment of a broad yet fragmented field, characterised by limitations in its theoretical and methodological articulation. The objective of this study is to identify research trends by conducting a systematic analysis of the literature in accordance with the PRISMA 2020 guidelines, thereby ensuring rigour and reproducibility. The results reveal a dynamic field with accelerated knowledge expansion, thematic diversity, and unequal distribution of production, which demands the development of integrative conceptual frameworks, interdisciplinary approaches, and critical analyses to understand its structural implications.

**Keywords:** Digital transformation; tourism; artificial intelligence; sustainability; smart tourism.

### INTRODUCTION

Digital transformation in the tourism sector is defined as a strategic process that integrates emerging technologies, such as artificial intelligence, big data, the Internet of Things, and digital platforms, with the aim of optimising the customer experience, improving operational efficiency, and strengthening the competitiveness of destinations and tourism organisations (Zhang et al., 2025; Bondarenko et al., 2025). This process directly impacts the design, management, and consumption of tourism services by promoting personalised, sustainable, and data-driven models, as well as the adoption of new digital paradigms and innovative business models (Bekele & Raj, 2025; Khoshroo & Soltani, 2025). Furthermore, the development of smart tourism ecosystems is driven by digitalisation, which is defined by technological interconnection, the optimisation of organisational processes, and the strengthening of dynamic capabilities in companies within the sector. This enables real-time decision-making and adaptation to change environments (Li & Guan, 2025).

In this context, scientific production on digital transformation in tourism has shown sustained growth, demonstrating an increased interest in analysing its implications, opportunities, and challenges, as well as in identifying trends, thematic clusters, and future lines of research (Bekele & Raj, 2025; Zhang et al., 2025). However, the diversity of theoretical, methodological, and contextual approaches gives rise to a broad and fragmented field of study, in which different perspectives on digital evolution, technological adoption, and the

sector's competitiveness converge (Bondarenko et al., 2025; Khoshroo & Soltani, 2025). Consequently, a systematic approach to research trends is required to identify patterns, gaps, and emerging lines of inquiry, to consolidate and guide the evolution of knowledge in this area and strengthen the understanding of the dynamics that structure the scientific development of digital tourism (Li & Guan, 2025).

Despite the sustained growth of scientific production on digital transformation in the tourism sector, the extant body of knowledge exhibits significant conceptual and methodological fragmentation (Gutierrez et al., 2025; Mavitha & Kushe Shekhar, 2025). This fragmentation hinders the establishment of a coherent knowledge structure, limiting a comprehensive understanding of the field's research dynamics. Consequently, it is challenging to accurately identify prevailing trends, emerging areas, and declining lines of inquiry, thus restricting the systematic interpretation of knowledge evolution (Hernández Sánchez & Oskam, 2025).

In a similar vein, the dearth of interdisciplinary dialogue between studies developed in disparate geographical contexts hinders the establishment of a comprehensive global perspective on scientific advancement in this domain (Han, 2025; Mavitha & Kushe Shekhar, 2025). This absence of integration gives rise to lacunae in the interpretation of research advances and hinders the identification of structural patterns. Consequently, the dissemination of knowledge is an impediment to a comprehensive understanding of the field, underscoring the necessity for the organisation and systematisation of academic production (Gutierrez et al., 2025). In this sense, the objective of this research is to identify research trends in the digital transformation of the tourism sector through a systematic analysis of scientific production to structure the field and guide future research. To achieve this objective, a series of questions must guide the analysis of the field.

1. What has been the evolution of the number of scientific publications per year on digital transformation in the tourism sector?
2. What are the main theoretical and thematic contributions that have shaped the development of the field?
3. How is scientific production geographically distributed, and which are the most influential countries, institutions, and authors?
4. What are the emerging, growing, and declining keywords that allow us to identify current and future research trends in the area?

The originality of this study lies in its ability to comprehensively structure the body of scientific knowledge on digital transformation in the tourism sector, thus overcoming the conceptual and methodological fragmentation reported in the literature. A systematic and contemporary analysis was conducted to identify research trends and knowledge gaps that have hindered the consolidation of the field. In this sense, the research is organised and synthesised to provide a solid foundation for formulating a research agenda, by contributing to the updating of scientific knowledge. The agenda is founded on emergent trends and yet unexplored areas, thereby promoting both theoretical and applied advancement within the sector.

## **METHODOLOGY**

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The research was developed through a systematic literature review in accordance with the guidelines of the PRISMA 2020 statement (Page et al., 2021), which establishes a structured and transparent procedure for the identification, selection and synthesis of scientific studies. This approach ensures the reproducibility of the process and the rigour in the collection and analysis of the available evidence. Consequently, the methodology adopted makes it possible to identify research trends in the digital transformation of the tourism sector.

### ELIGIBILITY CRITERIA

The eligibility criteria were defined with the objective of ensuring the relevance, quality, and coherence of the documents included in the analysis. The inclusion criteria for the present study encompass scientific studies published in indexed journals that address digital transformation in tourism contexts, including tourism, travel, hospitality, leisure, holidays, and related activities. The studies must be written in English or Spanish, available in full text, and employing theoretical, empirical, or review approaches that contribute to the analysis of research trends.

The exclusion criteria were established in three phases. Firstly, indexing errors were eliminated, including duplicate or inconsistent records. Secondly, documents without full-text access were excluded, although in this study this did not result in elimination since the initial selection was restricted to documents available in full. Thirdly, irrelevant documents were excluded, i.e. those containing related terms that did not directly address digital transformation in the tourism sector or did not contribute to the analysis of research trends.

### SOURCES OF INFORMATION

The information sources employed were the Scopus and Web of Science databases, which are recognised for their quality, multidisciplinary coverage, and rigorous indexing criteria (Culbert et al., 2025). Scopus is a bibliographic database that compiles peer-reviewed scientific literature, while Web of Science gathers selective collections of high-impact publications. Consequently, the amalgamation of these two approaches guarantees the attainment of representative, consistent, and reliable coverage of scientific output within the designated study area.

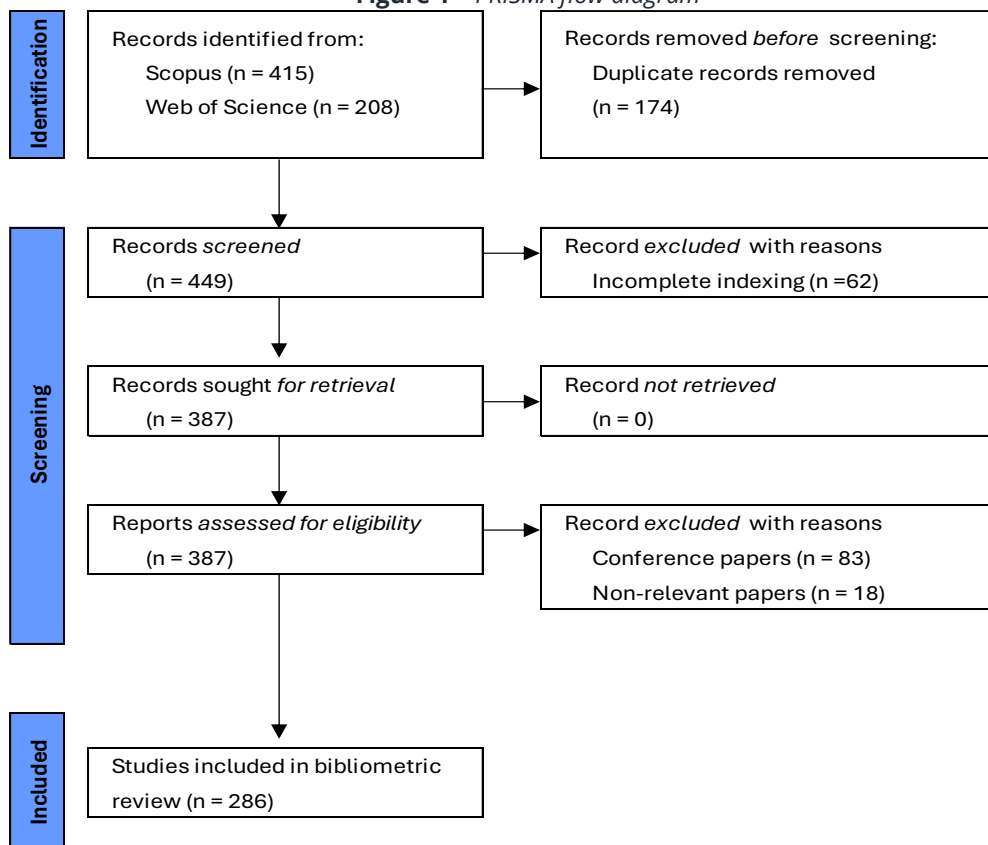
### SEARCH STRATEGY

The search strategy was defined using specific equations for each database, derived from the inclusion criteria and adapted to their structures and Boolean operators, in order to ensure accuracy and comprehensiveness in document retrieval. For Scopus the equation was used: ( ( TITLE ( "Digital Transformation" ) AND TITLE ( touris\* OR travel\* OR hospitalit\* OR leisure OR holiday OR vacation ) ) OR ( AUTHKEY ( "Digital Transformation" ) AND AUTHKEY ( touris\* OR travel\* OR hospitalit\* OR leisure OR holiday OR vacation ) ) ), while for Web of Science the equation was used: ( ( TS= ( "Digital Transformation" ) AND TS= ( touris\* OR travel\* OR hospitalit\* OR leisure OR holiday OR vacation ) ) OR ( AK= ( "Digital Transformation" ) AND AK= ( touris\* OR travel\* OR hospitalit\* OR leisure OR holiday OR vacation ) ) ), which allows to systematically identify the relevant scientific literature for the analysis.

### SELECTION PROCESS

The document selection process was carried out in accordance with the PRISMA 2020 methodology, encompassing the following stages: identification, screening, eligibility, and inclusion. These stages were meticulously documented and are presented in Figure 1 using the PRISMA flow diagram. The present procedure facilitates the systematic cleansing of records, thereby ensuring the exclusive inclusion of studies that meet the defined criteria and are relevant for the analysis of research trends.

**Figure 1 – PRISMA flow diagram**



**Source:** Prepared by the author based on Page et al. (2021)

### DATA PROCESSING

The data processing was conducted utilising the Microsoft Excel software, a tool designed for the organisation, cleansing and systematisation of the collected information. Variables such as authors, year of publication, country, keywords, and thematic focus were structured in Excel, allowing for the descriptive and comparative analysis of the information and the identification of patterns and trends in scientific production, ensuring the traceability and consistency of the analysis.

### RISK OF BIAS

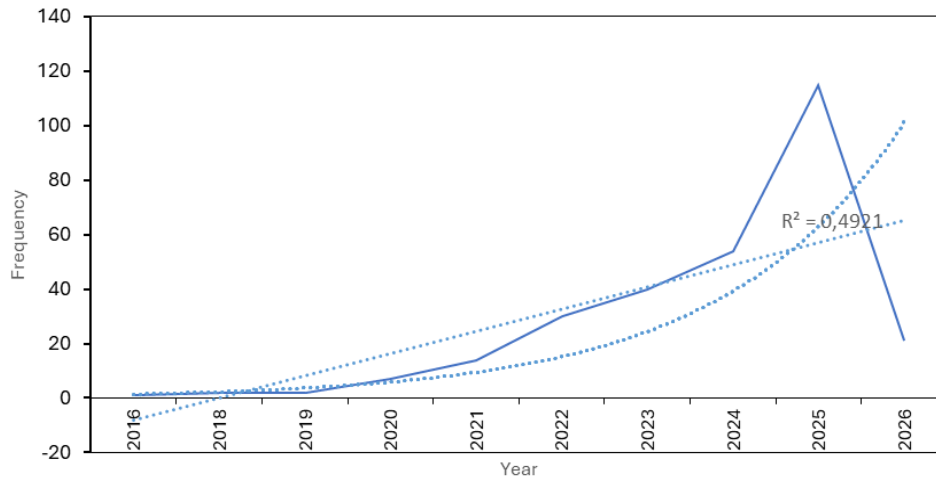
The risk of bias was mitigated through the implementation of rigorous criteria in the selection and analysis of documents, with a particular emphasis on studies published in indexed and peer-reviewed journals to ensure the quality of the evidence. The utilisation of recognised databases and a systematic protocol serves to reduce selection bias; however, risks remain pertaining to the coverage of these databases, the terms defined in the search strategy, and potential reporting biases, as well as the exclusion of non-indexed literature or literature in other languages, which limits the generalisability of the results.

### RESULTS

Scientific production on digital transformation in the tourism sector developed between 2016 and 2026, with a trend of sustained and accelerated growth being identified. An exponential increase with a rate of 49.21% was identified (see Figure 2), which demonstrates the consolidation of the field in the last decade. This assertion is substantiated by the annual escalation in publications, which exhibited a notable augmentation from 12 articles in 2016 to 18 in 2018, 22 in 2019, 7 in 2020, 14 in 2021, 30 in 2022, 40 in 2023, 54 in 2024, 115 in 2025, and 121 in 2026, thereby corroborating an evident expansion in recent years. The

model fit demonstrates a high coefficient of determination ( $R^2$ ), indicating that exponential growth is a significant factor in explaining the variability in the data and supports the consistency of the observed trend.

**Figure 2** – Evolution of the number of publications



**Source:** Own elaboration

The scientific body's analysis focuses on the 10 most cited articles on digital transformation in the tourism sector, as presented in Table 1. These articles demonstrate the main theoretical and applied contributions in the field. A review of the extant literature reveals a plethora of studies addressing various aspects of digital transformation in the hospitality and tourism sectors (Cheng et al., 2023), the co-creation of experiences through big data (Cuomo et al., 2021), the development of competencies in hotel management (Busulwa et al., 2022), and its applications in revenue management (Alrawadieh et al., 2021). In addition, there are contributions on a range of topics, including technological acceptance (Jayawardena et al., 2023), smart destinations (Gretzel, 2022), virtual reality (Oncioiu et al., 2022), bibliometric reviews (Madzík et al., 2023), organisational learning (Schönherr et al., 2023), and sustainability in smart hotels (Casais et al., 2023). This demonstrates the thematic diversity and evolution of the field.

**Table 1** – Main contributions in the literature

| N | Authors                     | Article                                                                                                | Citations | Journal                                                      |
|---|-----------------------------|--------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------|
| 1 | Cheng,, et al., (2023)      | A digital transformation approach in hospitality and tourism research                                  | 117       | International Journal Of Contemporary Hospitality Management |
| 2 | Cuomo,, et al., (2021)      | Digital transformation and tourist experience co-design: Big social data for planning cultural tourism | 106       | Technological Forecasting And Social Change                  |
| 3 | Busulwa,, et al., (2022)    | Digital transformation and hospitality management competencies: Toward an integrative framework        | 102       | International Journal Of Hospitality Management              |
| 4 | Alrawadieh,, et al., (2021) | Digital transformation and revenue management: Evidence from the hotel industry                        | 84        | Tourism Economics                                            |

|    |                               |                                                                                                      |    |                                                 |
|----|-------------------------------|------------------------------------------------------------------------------------------------------|----|-------------------------------------------------|
| 5  | Jayawardena, , et al., (2023) | Technology acceptance antecedents in digital transformation in hospitality industry                  | 80 | International Journal Of Hospitality Management |
| 6  | Gretzel, (2022)               | The Smart DMO: A new step in the digital transformation of destination management organizations      | 75 | European Journal Of Tourism Research            |
| 7  | Oncioiu,, et al., (2022)      | The Use of Virtual Reality in Tourism Destinations as a Tool to Develop Tourist Behavior Perspective | 53 | Sustainability                                  |
| 8  | Madzik, et al., (2023)        | Digital transformation in tourism: bibliometric literature review based on machine learning approach | 49 | European Journal Of Innovation Management       |
| 9  | Schönherr, et al., (2023)     | Organisational learning and sustainable tourism: the enabling role of digital transformation         | 49 | Journal Of Knowledge Management                 |
| 10 | Casais, et al., (2023)        | Smart and sustainable hotels: tourism agenda 2030 perspective article                                | 47 | Tourism Review                                  |

**Source:** Own elaboration

A close examination of the global distribution of research reveals a notable concentration of scientific output in specific countries, as illustrated in Figure 3. China has published the most articles, with 31 publications, followed by India with 23, and the United States with 21. This demonstrates the dominance of Asia and North America in the development of the field. Within Europe, Portugal and Spain are noteworthy, with 13 each, followed by Greece, Russia, and Ukraine. In Southeast Asia, significant participation is observed from Indonesia, Malaysia, and Vietnam. The Latin American contribution is comparatively negligible, with countries such as Peru and Colombia being notable exceptions. In continental terms, Asia accounts for the largest share of production, followed by Europe and the Americas. This reflects an uneven distribution of knowledge and greater dynamism in regions with more advanced technology and tourism.

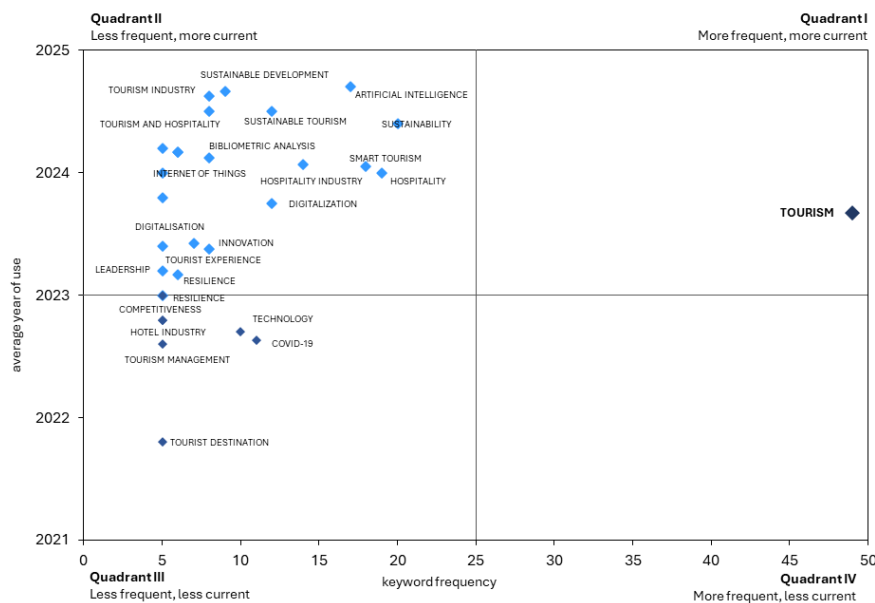
**Figure 3 – Global distribution**



**Source:** Own elaboration

In analysing research trends on digital transformation in the tourism sector, a scatter plot is utilised, representing the average year of keyword usage on the Y-axis and their frequency on the X-axis, as demonstrated in Figure 4. In this plot, the first quadrant is comprised of the fastest-growing keywords, i.e. those which are both most researched and most recently used. The second quadrant is characterised by the representation of emerging concepts, which, despite their infrequent utilisation, exhibit a recent average year of use. Finally, the fourth quadrant encompasses keywords that are undergoing a decline in usage; despite their frequent research, these keywords have an older average year of use.

**Figure 4 – Main keywords**



**Source:** Own elaboration

Regarding the details of the keywords by quadrant, quadrant 1 includes terms such as "Digital Transformation," "Tourism," and "Sustainability," which are characterised by a high frequency of use and a recent average year of use, reflecting their growing relevance in current research. It is evident that Quadrant 2 encompasses concepts such as "Smart Tourism" and "Artificial Intelligence". Despite their infrequent utilisation, these concepts possess a recent average age of one year, thereby signifying their emergence as trends within the digital transformation of the tourism sector. Finally, quadrant 4 groups terms such as "Tourism Management" and "Hospitality Industry," which, although still frequently used, have a recent average age of one year, revealing that their relevance in research is declining.

## DISCUSSION

The subsequent section is structured through a critical analysis of the results, followed by a comparison with findings reported in the literature. The aim of this process is to identify both convergences and divergences in the field. In the following section, the primary research gaps are analysed, and an agenda is proposed to address them and strengthen knowledge. Finally, the theoretical, political and practical implications of the study, along with its limitations, are presented.

### RESULTS ANALYSIS

The findings indicate a substantial increase in scientific output since 2016, suggesting a progressive consolidation of the field of digital transformation in tourism. However, this growth does not necessarily imply theoretical maturity. In the initial stage, the literature focused on analysing the general effects of digitalisation on destinations and organisations (Kohle, 2016), while recent studies incorporate more complex models that integrate variables such as trust, organisational capabilities, and ecosystem conditions (Tavanxhiu et al., 2026). Concurrently, a paradigm shift towards approaches centred on competencies, sustainability, and service design is identified (Arora et al., 2025; Rukpollmuang et al., 2026), thereby demonstrating that this conceptual evolution is still underway.

In this sense, an analysis of the most cited articles indicates a transition from conceptual approaches to applied frameworks oriented towards management and decision-making. Cheng et al. (2023) provide a theoretical framework for understanding the field, while Cuomo et al. (2021) adopt a data-driven approach to value co-creation. Consequently, Busulwa et al. (2022) and Jayawardena et al. (2023) have undertaken a more in-depth exploration of technological competencies and acceptance through the utilisation of predictive models. However, tensions between theory and practice have been identified, as evidenced by operational limitations such as costs and implementation barriers (Alrawadieh et al., 2021). These limitations reflect conceptual fragmentation and a discrepancy between theoretical development and application.

Globally, scientific production is concentrated in regions with greater technological and economic capacity, which introduces biases into knowledge construction. In China, research is oriented towards enhancing organisational efficiency and decentralisation (Hu et al., 2026); in India, a pragmatic approach centred on digital marketing and competitiveness prevails (Mishra et al., 2026). In Europe, integration between technology, heritage, and education is evident, as evidenced by research in Portugal (Marques & Martins, 2026), while in Russia, hybrid approaches such as phygital are being developed (Grudtsyn, 2024). In emerging contexts such as Jordan, the emphasis is on technology adoption from an individual perspective (Saeed et al., 2026), which demonstrates structural heterogeneity and limits the generalizability of results.

From a thematic perspective, the keywords demonstrate a dynamic of transition between consolidation and emergence. The fundamental concepts underpinning this initiative are structured around three core pillars: sustainability, artificial intelligence, and tourism management. This approach aligns with systemic and applied methodologies, as evidenced by recent studies (Rukpollmuang et al., 2026; Tavanxhiu et al., 2026). Concurrently, terminology pertaining to advanced technologies and data analysis is emerging, signifying a methodological reconfiguration within the field. However, the presence of declining topics linked to specific contexts demonstrates a dependence on recent events, which may affect theoretical stability.

### COMPARISON WITH OTHER STUDIES

The study's findings are consistent with recent literature, which has demonstrated accelerated growth and progressive consolidation in the field. This is in accordance with research that highlights the strategic role of digital transformation in the performance and competitiveness of the tourism sector (Succurro, 2026; Khaeriah & Zarkasih, 2026). Digitalization is emerging as a central driver of change, in line with approaches that emphasise strategic planning and technological integration to optimise organisational outcomes (Chen et al., 2026). Furthermore, the significance of sustainability and innovation

is in alignment with studies that emphasise the role of digital capabilities and governance in sustainable tourism development (Wijana et al., 2026).

However, the present study identifies significant differences, demonstrating that the expansion of the field does not imply a homogeneous theoretical consolidation. Whilst earlier studies have emphasised advancements in strategic models and quantitative instruments for decision-making (Chen et al., 2026), the findings indicate an enduring conceptual fragmentation and a discrepancy between theoretical progression and practical implementation, a phenomenon also observed in technological implementation contexts (Khaeriah & Zarkasih, 2026). Moreover, although comparative studies indicate the effectiveness of digital strategies in different sectors (Petrova et al., 2026), the analysis reveals that this effectiveness is contingent on structural factors, such as institutional capacities and geographical inequalities.

Moreover, the identification of thematic dynamics through the utilisation of keywords engenders a more precise temporal perspective on the evolution of the field. In contrast to studies that concentrate on causal relationships or organisational outcomes (Succurro, 2026), this analysis enables the differentiation of consolidated, emerging, and declining themes, thereby facilitating a comprehensive understanding of knowledge trajectories.

#### RESEARCH GAPS

As illustrated in Table 2, the primary research lacunae have been systematised, with inquiries devised to elucidate these issues in subsequent studies. This structure has been demonstrated to organise the theoretical, methodological, geographical, and temporal gaps in the field, facilitate the formulation of rigorous and coherent scientific agendas, and contribute to the progressive development of knowledge through a systematic and cumulative construction of science.

**Table 2 – Research gaps**

| Category              | Gap                                                             | Future research question                                               |
|-----------------------|-----------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Governance</b>     | Lack of digital governance frameworks in destinations           | How do digital governance models influence tourism competitiveness?    |
| <b>Ethics</b>         | Limited use of ethical approaches in digital technologies       | What ethical implications arise from the digitization of tourism?      |
| <b>Data</b>           | Lack of interoperability between tourism data systems           | How does data interoperability impact tourism management?              |
| <b>Experience</b>     | Limited comprehensive measurement of digital tourism experience | How to evaluate the tourist experience in hybrid digital environments? |
| <b>Resilience</b>     | Limited integration of digital resilience in destinations       | How does digitalization contribute to tourism resilience?              |
| <b>Talent</b>         | Deficit in specialized digital training in tourism              | What digital skills are critical for tourism talent?                   |
| <b>Co-creation</b>    | Low user integration in innovation processes                    | How does digital co-creation influence the design of tourism services? |
| <b>Sustainability</b> | Lack of digital metrics for sustainable tourism                 | How to measure the digital impact on tourism sustainability?           |
| <b>Security</b>       | Understudied risks in tourism cybersecurity                     | How does cybersecurity affect the trust of the digital tourist?        |
| <b>Platforms</b>      | Dependence on dominant global digital platforms                 | What effects does platform dependency have on local destinations?      |

**Source:** Own elaboration

### RESEARCH AGENDA

A research agenda is proposed to broaden the field and redefine its analytical foundations, addressing gaps related to governance, ethics, data, and sustainability. Firstly, it proposes a shift towards approaches that transcend the instrumental view of digital transformation. In this regard, the framework under discussion incorporates organisational, territorial, and governance dimensions, thus allowing for the analysis of its impact on the redistribution of power and dependence on digital platforms. Secondly, it proposes a shift in focus from the adoption of technology to its systemic effects, with studies on data interoperability, artificial intelligence, and digital architectures being prioritised, in addition to their implications for decision-making and the tourism experience. Thirdly, it is proposed that analyses on inequality, inclusion, and cybersecurity be incorporated, with the understanding that digitalization is a non-neutral process with the capacity to deepen structural gaps and affect trust in digital environments. Furthermore, it recommends the strengthening of the study of sustainability through the implementation of integrated metrics that give consideration to technological, environmental and social impacts. The objective of this study is to develop prospective approaches that facilitate anticipation of transformation scenarios, integrating variables such as digital talent, co-creation, and resilience, with the aim of progressing towards a more articulated, critical, and methodologically robust field.

### IMPLICATIONS

From a theoretical standpoint, the results redefine digital transformation in tourism as an expanding field with partial and fragmented consolidation. This necessitates a shift from descriptive approaches to integrative conceptual frameworks that articulate technological, organisational and territorial dimensions. Such frameworks should question the supposed maturity of the field and demand critical perspectives that explain not only technological adoption but also its structural implications for the sector's configuration.

From a theoretical perspective, the results redefine digital transformation in tourism as an expanding field with partial and fragmented consolidation. In the political sphere, the findings demonstrate that digital transformation is neither homogeneous nor autonomous; rather, it is conditioned by institutional capacities, infrastructure, and governance frameworks. To address these issues, public policies must be implemented that extend beyond the mere promotion of technological adoption. Instead, these policies should incorporate regulatory frameworks, risk management strategies associated with data concentration, and the reduction of digital divides between different territories. Furthermore, international cooperation should be focused on capacity building rather than the perpetuation of technological dependencies.

In practical terms, the results indicate that the competitiveness of the tourism sector is contingent on the strategic integration of technologies into business models, organisational culture, and experience management. This suggests that there should be a focus on the development of analytical capabilities, digital talent, and adaptive organisational structures, as well as the incorporation of approaches that articulate sustainability, innovation, and customer experience. It is important to recognise that digital transformation reconfigures both operational processes and the value proposition of contemporary tourism.

### LIMITATIONS

The study is subject to certain limitations, which are rooted in the selection of databases and the definition of search terms. These limitations result in the exclusion of relevant documents. The exclusion of non-indexed literature and publications in other languages has been demonstrated to reduce the representativeness of the results and introduce potential

biases in the interpretation of the field. Additionally, the descriptive approach used limits the identification of causal relationships and longitudinal dynamics. It is therefore recommended that these aspects be considered when analysing the findings and guiding the development of future research with greater methodological scope.

## CONCLUSIONS

The study defines digital transformation in tourism as a dynamic field characterised by an accelerated expansion of knowledge without a fully articulated theoretical consolidation. This dynamic field demands the development of integrative and critical interpretive frameworks. The structuring of the field shows thematic diversity and unequal distribution of knowledge, which requires the overcoming of fragmented approaches and dependencies on dominant contexts. The identification of emerging patterns and conceptual trajectories indicates that the future development of the area will depend on the integration of interdisciplinary approaches, the analysis of structural tensions and the orientation of research towards a critical and contextualised understanding of the phenomenon.

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Conceptualization and writing—original draft preparation, AVA, CAPG, WLC, SCA, MCBG, and JCRH; writing—review and editing, AVA, CAPG, WLC, SCA, MCBG, and JCRH.

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### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

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### **DATA AVAILABILITY STATEMENT**

Data supporting the findings of this study are available upon reasonable request.

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### **ETHICS STATEMENT**

This study did not involve human participants or animals and therefore did not require ethical approval.

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