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SMART TOURISM AND CHANGING TOURIST CONSUMPTION BEHAVIOR: TOWARD AN INTEGRATED UNDERSTANDING

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Abstract

This study explores the link between smart tourism and tourist consumption behavior by systematically mapping and interpreting intelligent constructs. Adopting a bibliometric research design, the authors analyze 718 Scopus-indexed journal articles and review papers published between 2015 and 2025. A transparent, behavior-oriented screening process was applied to retain studies that explicitly examine how smart tourism technologies interact with destination contexts to shape tourists' experiences, evaluations, and consumption-related decisions. The analysis combines descriptive performance analysis with keyword co-occurrence, thematic evolution analysis, and thematic mapping using VOSviewer and Bibliometrix. Beyond structural mapping, the study incorporates an interpretative synthesis to examine how behavioral outcomes such as experience formation, satisfaction, loyalty, adoption, and engagement are conceptualized across the literature. The findings reveal a gradual shift from technology-focused perspectives toward more behaviorally grounded and decision-oriented approaches, while also highlighting persistent conceptual fragmentation in the ways smart tourism is linked to tourist consumption behaviour. By organising dispersed research streams into a coherent conceptual landscape, this study contributes to a clearer understanding of how smart tourism reshapes tourist behaviour within digitally mediated destination environments. The findings offer a structured foundation for future research and provide actionable insights for destination managers seeking to align smart tourism initiatives with meaningful behavioral and consumption outcomes across diverse destination contexts.

Keywords: Smart Tourism; Tourist Consumption Behavior; Socio-Technical Systems; Decision-Making; Bibliometric Review; Emerging Economies.

1. INTRODUCTION

In recent years, the accelerated diffusion of digital technologies has substantially reshaped the tourism landscape, gradually giving rise to what is now widely referred to as *smart tourism*. Rather than being confined to earlier notions of e-tourism or ICT-enabled services, this concept has evolved into a more systemic paradigm that integrates digital infrastructures, data ecosystems, and destination-level innovation processes (Gretzel U et al., 2015; Buhalis Dimitrios & Amaranggana, 2014; Li Y et al., 2017). In this expanded view, smart tourism is not merely technological but also organizational and experiential, encompassing governance mechanisms and co-creation dynamics within tourism ecosystems.

Alongside this transformation, increasing scholarly attention has been directed toward tourist consumption behavior as a critical outcome dimension. A growing body of research suggests that the effectiveness of smart tourism initiatives is ultimately realized through

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tourists' subjective evaluations, including satisfaction, trust, engagement, and loyalty (Kim J & Fesenmaier, 2015; Sigala Marianna, 2018).

In other words, tourists are not passive beneficiaries of digital services; instead, they actively interpret and negotiate technology-mediated experiences, thereby shaping both perceived value and behavioral responses. This perspective subtly shifts the analytical focus from technology adoption to experience construction and decision-making processes.

However, despite the rapid expansion of this research domain, the literature remains somewhat fragmented. From a synthesized reading, at least three partially disconnected streams can be observed. The first stream emphasizes technological infrastructures and smart destination systems, focusing on connectivity, efficiency, and digital capability development (Buhalis & Amaranggana, 2014; Gretzel et al., 2016).

The second stream adopts a data-centric orientation, leveraging big data analytics and computational techniques to optimize tourism operations and predict demand patterns (Mariani M et al., 2018; Xiang Z et al., 2017). The third stream, in contrast, centers on behavioral and experiential dimensions, examining how tourists perceive, engage with, and respond to smart environments (Neuhofer et al., 2015; Sigala, 2018). While each stream contributes valuable insights, their integration remains limited, leading to an incomplete understanding of how technological advancements translate into consumption behavior.

This fragmentation is further compounded by an uneven application of theoretical foundations. Technology-oriented studies often implicitly assume a direct linkage between digital infrastructure and positive behavioral outcomes, whereas data-driven approaches tend to prioritize predictive accuracy over explanatory depth. Conversely, behavior-focused studies occasionally overlook the structural and technological contexts shaping tourist decisions. As a result, the field still lacks a cohesive framework that systematically connects technological capabilities, destination strategies, and individual-level consumption behavior (Xiang Z et al., 2021).

Another issue that warrants attention is the contextual imbalance in empirical research. Existing studies are predominantly concentrated in technologically advanced destinations, where digital readiness and infrastructure are relatively mature. In contrast, emerging economies—where institutional constraints, uneven digital development, and heterogeneous tourist segments are more pronounced—remain underexplored. This imbalance suggests that current findings may not be fully generalizable, and it highlights the need for a more inclusive and context-sensitive synthesis of the literature.

Given these limitations, bibliometric analysis offers a particularly suitable approach for systematically consolidating fragmented knowledge. By mapping publication trends, conceptual structures, and thematic evolution, bibliometric techniques enable scholars to uncover hidden patterns and intellectual linkages that are often difficult to capture through traditional narrative reviews (Donthu N et al., 2021; Aria Massimo & Cuccurullo, 2017; Zupic Ivan & Čater, 2015). Nevertheless, prior bibliometric studies have rarely examined

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the intersection between smart tourism and tourist consumption behavior in an explicitly integrative manner.

Against this backdrop, the present study seeks to map and interpret the intellectual structure and thematic evolution of research on smart tourism and tourist consumption behavior using a bibliometric approach. Drawing on a dataset of 718 Scopus-indexed journal articles and review papers published between 2015 and 2025, the study addresses three guiding research questions:

1) How has scientific production in this domain evolved over time?
2) What journals, themes, and conceptual clusters structure the field?
3) How has the literature shifted from technology-centered perspectives toward more behaviorally informed and integrative approaches?

By addressing these questions, this study contributes in a nuanced manner. It not only clarifies the dynamics of fragmentation and convergence within the field but also identifies underexplored themes and contexts, particularly in emerging economies. More importantly, it provides a foundation for developing theoretically grounded and behaviorally sensitive research frameworks in smart tourism.

The remainder of the paper is organized as follows: Section 2 presents the methodology, Section 3 reports the results, Section 4 discusses the findings, Section 5 outlines research gaps and future directions, Section 6 highlights implications, and Section 7 concludes the study.

2. METHODOLOGY

2.1. Data source and search strategy

Table 1: Search strategy and dataset construction for smart tourism and tourist consumption behavior research

Component	Description
Database	Scopus
Search fields	TITLE-ABS-KEY
Smart tourism–related terms	“smart tourism”, “smart destination*”, “smart city tourism”, “digital tourism”, “tourism digitalization”, “technology-enabled tourism”, “ICT-enabled tourism”, “intelligent tourism”, “technology-mediated tourism”
Tourist-related terms	tourist*, travel*, visitor*
Consumption and behavior terms	experience*, satisfaction, loyalty, intention*, decision*, engagement, trust, “perceived value”, adoption, acceptance, usage, behavior*, behaviour*
Time span	2015–2025
Document types	Articles, Reviews
Language	English
Final dataset size	718 documents

Source: Authors’ search strategy and dataset construction based on the Scopus database.

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This study adopts a bibliometric research design to systematically map and synthesize the intellectual structure of research on smart tourism and tourist consumption behavior. The Scopus database was selected as the primary data source due to its extensive coverage of high-quality, peer-reviewed journals across tourism, hospitality, management, and information systems. Scopus is widely used in bibliometric studies and provides a reliable basis for ensuring transparency, consistency, and replicability in data collection.

To construct the dataset, an advanced search was conducted using the TITLE-ABS-KEY fields in Scopus to capture publications that explicitly address smart tourism and its behavioral implications.

The search strategy combined three groups of keywords: (i) smart tourism–related concepts (e.g., *smart tourism, smart destination, smart city tourism, digital tourism, technology-enabled; tourism*), (ii) tourist-related terms (e.g., *tourist*, travel*, visitor**), and (iii) consumption and behavior-related constructs (e.g., *experience*, satisfaction, loyalty, intention*, decision*, engagement, trust, perceived value, adoption, acceptance, usage, behavior**).

The search was restricted to publications published between 2015 and 2025, reflecting the period during which smart tourism has emerged and evolved as a distinct research domain. Only peer-reviewed journal articles and review papers written in English were retained to ensure academic rigor and comparability across studies. After applying these criteria, a final dataset of 718 documents was obtained. An overview of the search strategy and dataset construction is presented in Table 1.

2.2. Data screening and inclusion criteria

After data retrieval, the dataset underwent a progressive screening process designed not only to improve technical consistency, but more importantly to ensure conceptual alignment with the behavioural focus of this study. Rather than relying on keyword matching alone, the screening was guided by a clear analytical judgement regarding what constitutes *behaviour-oriented smart tourism research*.

In an initial step, duplicate records were removed. Subsequently, titles and abstracts were carefully reviewed to identify studies that engaged explicitly with tourist consumption behaviour, experiential outcomes, or decision-making processes in smart tourism contexts. Publications that addressed digitalisation, smart infrastructure, or information technologies in tourism without explicitly linking these developments to tourist behaviour or consumption-related outcomes were excluded at this stage.

This distinction is critical. While technological innovation and digital systems form an essential backdrop to smart tourism, they do not, in themselves, explain how tourists perceive, experience, and act within smart destinations. Accordingly, studies that treated technology as an end in itself rather than as a mechanism shaping behavioural responses were considered conceptually misaligned with the objectives of this review.

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Through this screening logic, the final dataset captures research that explicitly examines the behavioural implications of smart tourism, focusing on how technologies interact with destination contexts to influence tourists' experiences, evaluations, and consumption-related decisions.

2.3. Data analysis techniques

To examine the literature from multiple analytical angles, the study employs a set of complementary bibliometric techniques that combine structural mapping with interpretative synthesis.

First, a descriptive performance analysis was conducted using Scopus analytical tools to examine annual publication trends and the distribution of studies across journals and sources. This step provides a contextual overview of how research on smart tourism and tourist consumption behaviour has evolved over time.

Second, keyword co-occurrence analysis was carried out using VOSviewer to identify major research clusters based on author keywords. This analysis reveals the dominant thematic groupings within the literature and highlights how different research streams are connected at a conceptual level.

Third, thematic evolution analysis and thematic mapping were conducted using the Bibliometrix package in R. Thematic evolution analysis traces shifts in research emphasis across successive periods, while the thematic map positions key themes according to their centrality and density, offering insights into their relative maturity and strategic importance within the broader knowledge structure.

Importantly, these bibliometric outputs were not treated as an end point. An additional interpretative layer was applied to examine how the identified themes reflect different ways in which smart tourism has been conceptualised in relation to tourist consumption behaviour.

Rather than viewing clusters as isolated topics, this step focuses on how behavioural outcomes such as experience formation, satisfaction, loyalty, adoption, and engagement are framed and explained across the literature.

This interpretative synthesis allows the study to move beyond descriptive mapping and to identify patterns of conceptual fragmentation and convergence within the field. In doing so, it highlights a gradual shift from technology-centred perspectives toward more behaviourally grounded and decision-oriented approaches, thereby providing a clearer understanding of the intellectual organisation of research on smart tourism and tourist consumption behaviour.

2.4. Methodological rigor and limitations

Several measures were adopted to enhance methodological rigor, including the use of transparent search criteria, well-established bibliometric tools, and consistent analytical procedures. Nevertheless, certain limitations should be acknowledged. The analysis is

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restricted to Scopus-indexed and English-language publications, which may exclude relevant studies published in other databases or languages.

Moreover, bibliometric techniques emphasize structural patterns and thematic relationships rather than the substantive quality of individual studies. Despite these limitations, the methodological approach provides a robust and replicable framework for examining the evolution and intellectual organization of smart tourism and tourist consumption behavior research.

3. RESULTS

3.1. Annual scientific production and publication trends (2015–2025)

Figure 1 illustrates the annual scientific production related to smart tourism and tourist consumption behavior over the period 2015–2025. Overall, the publication trajectory reveals a clear and sustained upward trend, indicating the progressive consolidation of smart tourism as a recognized research domain within the broader tourism and hospitality literature.

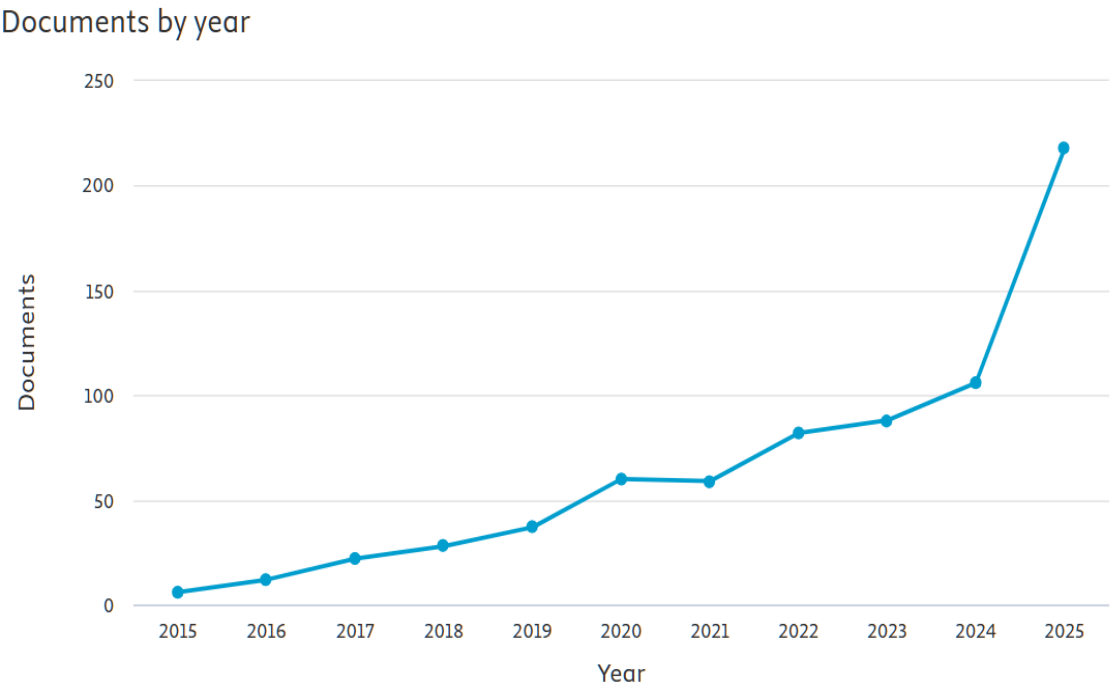

Figure 1: Annual scientific production on smart tourism and tourist consumption behavior (2015–2025)

Source: Authors' analysis based on data retrieved from the Scopus database.

During the early stage (2015–2017), the volume of publications remained relatively modest, with annual outputs increasing gradually from single-digit figures to fewer than 30 documents per year. This period can be interpreted as a formative phase, in which

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smart tourism was primarily discussed as a technology-oriented extension of e-tourism and digital travel services, with limited explicit attention to tourist consumption behavior.

A more pronounced growth phase emerged between 2018 and 2019, when annual publications rose steadily, reflecting growing scholarly interest in smart destinations, data-enabled tourism services, and experience personalization. This expansion suggests a shift from conceptual experimentation toward more structured empirical and analytical inquiries.

The year 2020 marks a notable inflection point in the publication trend. Despite a slight stabilization in output during 2021, the overall trajectory from 2020 onward indicates accelerated research activity. This pattern coincides with the disruptive effects of the COVID-19 pandemic, which intensified academic attention to digital solutions, contactless services, and technology-mediated tourist experiences. Importantly, research during this phase increasingly incorporated behavioral constructs such as satisfaction, trust, intention, and loyalty, signaling a gradual reorientation from technology-centered discussions toward consumption-related outcomes.

From 2022 to 2025, the field experienced rapid expansion, culminating in a sharp surge in publications in 2025. This recent acceleration underscores the growing recognition of tourist consumption behavior as a critical analytical lens for understanding the effectiveness and implications of smart tourism initiatives, particularly in post-pandemic and digitally transformed tourism environments.

Taken together, the observed publication trend suggests that smart tourism research has evolved from an emerging, technology-driven topic into a more mature and behaviorally informed research stream. The sustained growth in recent years provides a strong empirical basis for subsequent bibliometric mapping and conceptual synthesis, as presented in the following sections.

3.2. Most productive journals and sources

Table 2: Most productive journals in smart tourism and tourist consumption behavior research (2015–2025)

Rank	Journal / Source Title	Number of Articles
1	Sustainability (Switzerland)	78
2	Current Issues in Tourism	29
3	Asia Pacific Journal of Tourism Research	17
4	GeoJournal of Tourism and Geosites	12
5	Journal of Hospitality and Tourism Technology	12
6	Information Technology and Tourism	11
7	International Journal of Tourism Cities	11
8	Journal of Hospitality and Tourism Insights	11
9	Journal of Tourism Futures	10
10	Tourism Management	10

Source: Authors' analysis using Bibliometrix (R) based on data retrieved from the Scopus database.

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Table 2 presents the most productive journals publishing research on smart tourism and tourist consumption behavior during the period 2015–2025. The distribution of publications across sources highlights both the interdisciplinary nature of the field and the central role of tourism-focused journals in shaping its intellectual development.

Sustainability (Switzerland) emerges as the most prolific outlet, accounting for 78 articles. This dominance reflects the journal's broad interdisciplinary scope and its strong alignment with research themes linking digital transformation, sustainable tourism development, and consumer behavior. The prominence of *Sustainability* also indicates that smart tourism research is increasingly framed within wider sustainability and policy-oriented debates rather than being confined to purely technological discussions.

Traditional tourism journals occupy the next tier of productive sources. *Current Issues in Tourism* ranks second with 29 publications, followed by the *Asia Pacific Journal of Tourism Research* with 17 articles. These outlets are known for their emphasis on empirical tourism research and regional perspectives, suggesting that studies on smart tourism consumption behavior are frequently grounded in destination-specific and emerging-market contexts.

A group of technology- and innovation-oriented tourism journals, including the *Journal of Hospitality and Tourism Technology* and *Information Technology and Tourism*, also feature prominently. Their presence underscores the continued relevance of digital infrastructures, smart systems, and technology adoption in shaping tourist experiences and consumption patterns. At the same time, journals such as the *International Journal of Tourism Cities* and the *Journal of Tourism Futures* point to growing scholarly interest in urban smart tourism initiatives and forward-looking perspectives on tourism transformation.

Notably, high-impact flagship journals such as *Tourism Management* appear in the top ten despite a relatively lower number of publications. This pattern suggests that while fewer in volume, contributions published in leading journals tend to be more selective and theory-driven, often focusing on conceptual advancement and rigorous empirical testing.

Overall, the source distribution reveals a balanced publication landscape in which smart tourism and tourist consumption behavior research is disseminated across sustainability-oriented, technology-focused, and core tourism journals. This diversity reflects the field's gradual evolution from a technology-centered niche toward a more integrated research stream that combines behavioral, managerial, and sustainability perspectives.

3.3. Keyword co-occurrence analysis

Figure 2 presents the keyword co-occurrence network of research on smart tourism and tourist consumption behavior based on author keywords. The network reveals a well-structured and highly interconnected knowledge domain, in which *smart tourism* occupies a central and integrative position, linking multiple thematic clusters rather than functioning as a standalone or technology-specific concept.

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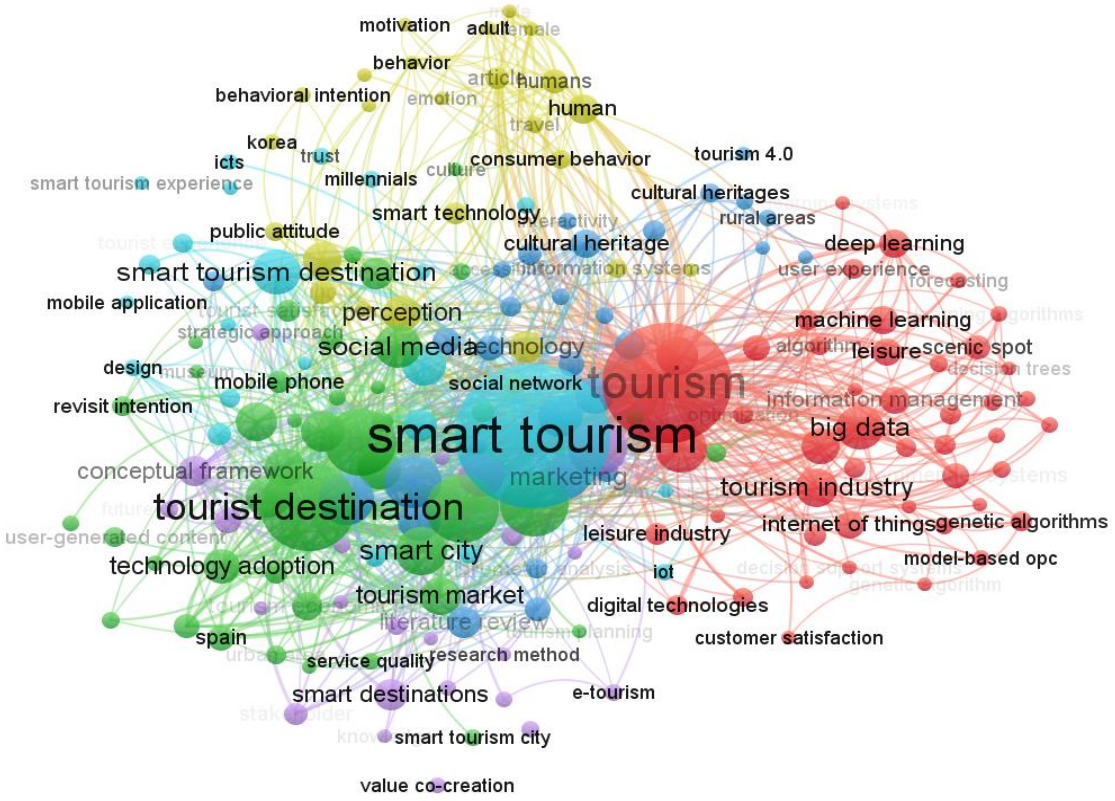

Figure 2: Keyword co-occurrence network of smart tourism and tourist consumption behavior research

Source: Authors' analysis using VOSviewer based on author keywords from the Scopus database.

The most prominent cluster is centered on *smart tourism* and closely connected terms such as *smart tourism destination*, *smart city*, *technology*, and *marketing*. This cluster reflects the foundational role of digital infrastructures, destination-level strategies, and technology-enabled services in shaping smart tourism systems. The dense interconnections within this cluster suggest that smart tourism is increasingly conceptualized as a destination-wide phenomenon, extending beyond individual technologies to encompass governance, planning, and service integration.

A second major cluster focuses on *tourist destination* and technology adoption–related themes, including *technology adoption*, *service quality*, *tourism market*, and *tourism economics*. This cluster highlights research examining how smart technologies are implemented at the destination level and how such implementations influence market performance and service outcomes. The proximity of this cluster to the core *smart tourism* node indicates that destination competitiveness and technological readiness remain central concerns in the literature. A third cluster is dominated by data-driven and computational approaches, with keywords such as *big data*, *machine learning*,

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recommender systems, *decision support systems*, and *optimization*. This stream reflects the growing use of advanced analytics and artificial intelligence to process large-scale tourism data and enhance decision-making in tourism management. Notably, this cluster maintains strong links with both the core smart tourism cluster and tourism industry–related terms, underscoring the role of data technologies as enabling mechanisms rather than isolated methodological tools. The fourth cluster emphasizes behavioral and human-centered dimensions, including *perception*, *emotion*, *trust*, *behavioral intention*, and *consumer behavior*. The integration of these behavioral constructs with technology- and destination-oriented keywords suggests a gradual shift in the literature toward understanding how tourists perceive, experience, and respond to smart tourism environments. Rather than being treated as independent outcomes, consumption-related variables are embedded within broader technological and experiential contexts.

Overall, the keyword co-occurrence structure reveals a conceptual evolution from technology-centric discussions toward a more holistic perspective in which tourist consumption behavior emerges from the interaction between digital infrastructures, destination strategies, and individual perceptions. This integrative structure provides a strong foundation for subsequent thematic analysis and supports the view of smart tourism as a multi-layered system in which technological innovation and human experience are jointly produced.

3.4. Thematic evolution of smart tourism research (2015–2025)

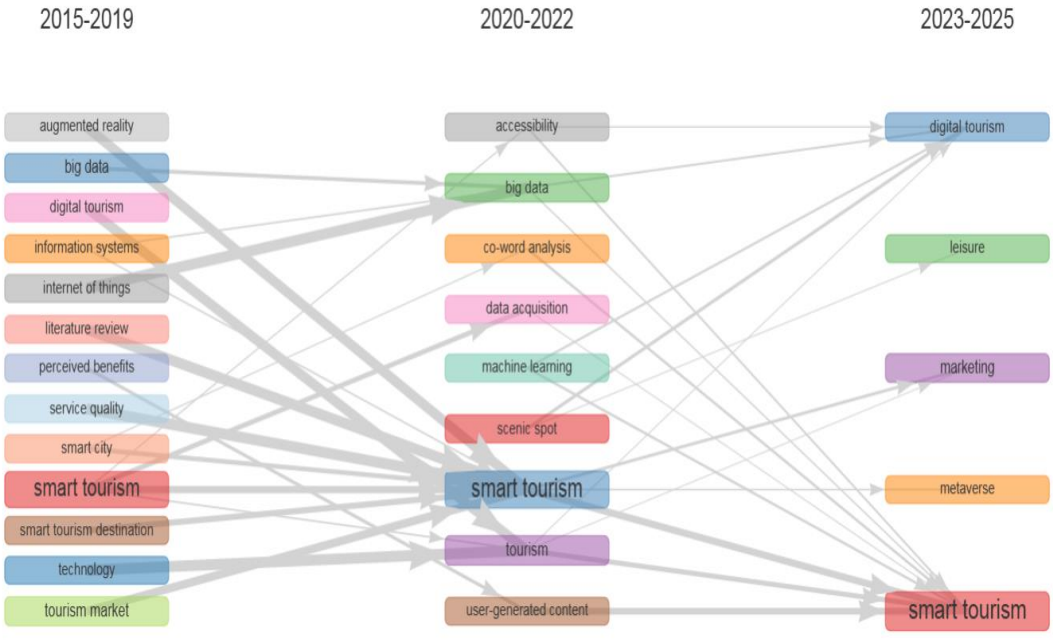

Figure 3: Thematic evolution of smart tourism research (2015–2025)

Source: Authors' analysis using Bibliometrix (R) based on data retrieved from the Scopus database.

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Figure 3 illustrates the thematic evolution of smart tourism research across three consecutive periods (2015–2019, 2020–2022, and 2023–2025), highlighting how the field has progressively shifted in focus and analytical orientation over time. The evolution map reveals a coherent and cumulative knowledge trajectory, with *smart tourism* functioning as a stable core concept while adjacent themes expand and diversify.

During the initial phase (2015–2019), research on smart tourism was predominantly technology-driven. Core themes in this period include *information systems*, *internet of things*, *big data*, and *smart city*, alongside application-oriented topics such as *service quality* and *perceived benefits*. These themes indicate that early studies primarily sought to establish the technological foundations of smart tourism and to explore how digital infrastructures could enhance destination management and basic tourist services. Consumption-related constructs were present but remained secondary, often framed as downstream outcomes of technological implementation rather than as central analytical concerns.

The second phase (2020–2022) marks a transition toward data-intensive and methodological consolidation. Keywords such as *big data*, *machine learning*, *data acquisition*, and *co-word analysis* gained prominence, reflecting an increased reliance on large-scale datasets and advanced analytical techniques. At the same time, *smart tourism* became more explicitly positioned at the center of the thematic structure, linking technological capabilities with emerging experiential and contextual dimensions such as *accessibility* and *scenic spot*. This period coincides with heightened digitalization pressures during the COVID-19 pandemic, which accelerated scholarly interest in contactless services, data-driven decision support, and technology-mediated tourist experiences.

In the most recent phase (2023–2025), the thematic landscape expands toward experience-oriented and market-facing themes. While *smart tourism* continues to serve as the dominant anchor, new directions such as *digital tourism*, *marketing*, *leisure*, and *metaverse* emerge as salient extensions. This shift suggests a growing emphasis on how smart tourism technologies are translated into value creation, experiential design, and consumption outcomes. Rather than focusing solely on technological adoption, recent studies increasingly examine how digital ecosystems shape tourist engagement, lifestyle-oriented leisure consumption, and marketing strategies in smart destinations.

Overall, the thematic evolution demonstrates a clear progression from technological infrastructure building to data-driven optimization and, more recently, to behaviorally and experientially oriented research. The sustained centrality of *smart tourism* across all periods underscores its role as an integrative concept, while the emergence of marketing- and leisure-related themes highlights a maturation of the field toward understanding tourist consumption behavior as a core research concern. This evolutionary pattern provides important context for interpreting current research gaps and supports the need for future studies that more explicitly integrate technological capabilities with behavioral and managerial perspectives.

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3.5. Thematic map and positioning of research themes

Figure 4 presents the thematic map of smart tourism and tourist consumption behavior research, based on the strategic diagram of centrality (relevance) and density (development). This visualization provides insights into the maturity, coherence, and structural role of major research themes within the field.

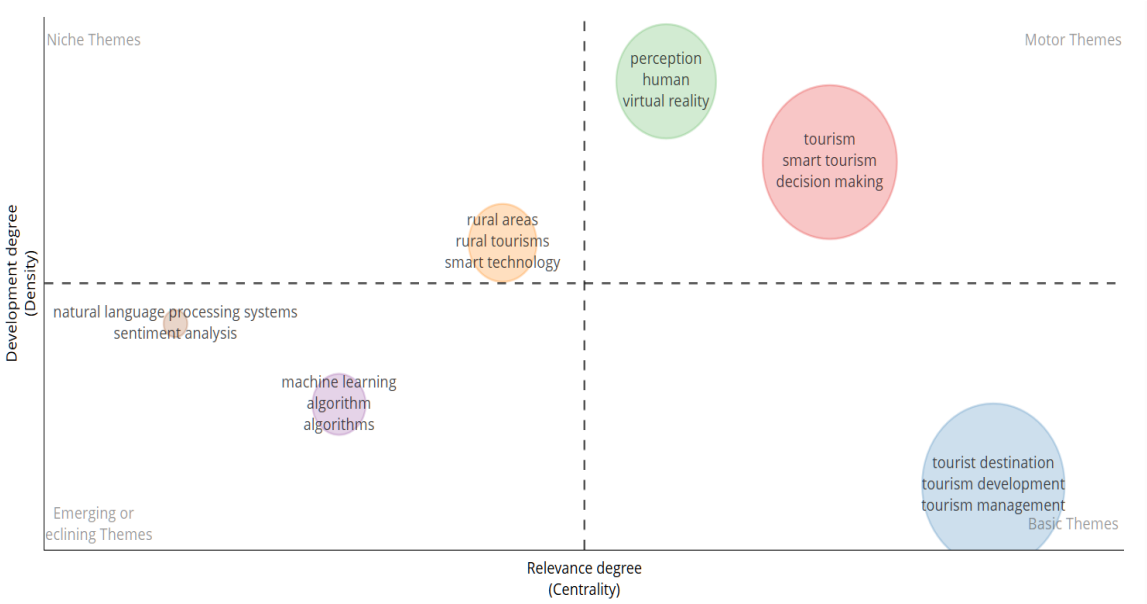

Figure 4: Thematic map of smart tourism and tourist consumption behavior research

Source: Authors' analysis using Bibliometrix (R) based on data retrieved from the Scopus database.

The motor themes quadrant (high centrality and high density) is dominated by the cluster labeled *tourism – smart tourism – decision making*. This cluster represents the most developed and influential research stream, functioning as the intellectual engine of the field. Its strong internal cohesion and high connectivity with other themes indicate that smart tourism has moved beyond a purely technological concept to become a central analytical framework for understanding tourist decision-making processes. The prominence of this cluster underscores the growing scholarly emphasis on how digital infrastructures, smart services, and data-driven systems shape consumption choices and behavioral outcomes in tourism contexts.

The basic themes quadrant (high centrality but low density) includes *tourist destination*, *tourism development*, and *tourism management*. These themes form the foundational knowledge base of the field and are widely connected to other research areas, yet they remain relatively underdeveloped in terms of internal conceptual integration. Their positioning suggests that destination-level and managerial perspectives provide essential contextual grounding for smart tourism research but often lack explicit behavioral

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theorization. This gap highlights opportunities for future studies to more systematically integrate tourist consumption behavior into destination development and management frameworks.

The niche themes quadrant (low centrality but high density) is characterized by *perception*, *human*, and *virtual reality*. These themes exhibit strong internal development and methodological sophistication but remain weakly connected to the broader research landscape. Their specialized nature indicates focused investigations into immersive technologies and human-centered experiential dimensions of smart tourism. While currently peripheral, these themes hold potential to inform deeper understanding of experiential value creation and affective responses within smart tourism environments.

Finally, the emerging or declining themes quadrant (low centrality and low density) includes clusters such as *machine learning*, *algorithms*, *natural language processing*, and *sentiment analysis*. The positioning of these themes suggests that advanced computational techniques are either in an early stage of integration or undergoing conceptual repositioning. Rather than constituting independent research domains, these methods increasingly function as analytical tools embedded within broader studies of tourist behavior, experience evaluation, and decision support.

Overall, the thematic map reveals a structured and evolving research field in which smart tourism serves as a stable core concept, while behavioral, experiential, and analytical themes occupy differentiated strategic positions. The configuration of themes indicates a clear transition from technology-centered foundations toward behaviorally informed and decision-oriented research, reinforcing the relevance of tourist consumption behavior as a central lens for future smart tourism studies.

4. DISCUSSION:

From fragmented perspectives to an integrated understanding of smart tourism and tourist consumption behavior

A closer reading of the findings suggests that smart tourism should not be interpreted as a simple linear progression driven by technological advancement. Instead, the relationship between digital capabilities and tourist behavior appears to unfold in a more uneven and context-dependent manner. In several instances, improvements in technological infrastructure do not automatically translate into corresponding shifts in consumption behavior, indicating that technological readiness alone provides only a partial explanation. This reinforces the view that smart tourism is inherently socio-technical, where meaning is constructed through tourists' subjective interpretations rather than embedded solely in digital systems (Gretzel et al., 2015; Xiang et al., 2021).

From a structural perspective, the bibliometric analysis reveals a field that is expanding rapidly, yet still lacks a unified intellectual core. Rather than converging into a single dominant paradigm, smart tourism research has developed along multiple parallel trajectories. These include technology-driven studies emphasizing infrastructure and system efficiency, data-oriented research focusing on analytics and predictive modeling,

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and behavior-centered approaches examining tourist perceptions and experiences. While such diversity reflects the interdisciplinary nature of the field, it also creates a fragmented knowledge landscape in which connections across levels of analysis remain underdeveloped (Zupic & Čater, 2015; Donthu et al., 2021).

Importantly, this fragmentation is not entirely accidental but can be traced back to the historical evolution of the field. Early studies were largely anchored in a technological logic, framing smart tourism as an extension of ICT-enabled systems and smart destination initiatives (Buhalis & Amaranggana, 2014; Gretzel et al., 2016). Within this perspective, tourist behavior was often positioned as an implicit outcome, assumed to improve as digital infrastructures became more advanced. However, such an assumption appears increasingly insufficient. The current findings indicate that behavioral responses are mediated by perception, context, and experience, rather than being directly determined by technological inputs.

A similar pattern can be observed in the rise of data-driven approaches. The adoption of big data analytics and machine learning has undoubtedly enriched the methodological toolkit of tourism research (Mariani et al., 2018; Xiang et al., 2017). Yet, in many cases, these approaches prioritize predictive accuracy over theoretical explanation. As a result, while it becomes possible to anticipate tourist behavior, it remains less clear why such behavior occurs. This imbalance highlights a subtle but important tension between methodological sophistication and theoretical depth within the field.

At the same time, the analysis also points to an emerging shift toward integration. More recent studies increasingly foreground tourist consumption behavior such as satisfaction, trust, engagement, and decision-making as a central analytical focus rather than a peripheral outcome (Sigala, 2018; Kim & Fesenmaier, 2015). This shift suggests a gradual reorientation of the field, from a technology-centric view toward a more behaviorally grounded perspective. In this emerging view, digital technologies are not ends in themselves but serve as enablers of experience and value creation.

The thematic evolution further illustrates this transition. Experience-oriented and decision-making themes are becoming more prominent, while technological and infrastructural elements are increasingly treated as supporting conditions. Meanwhile, emerging topics such as immersive technologies, perception, and co-creation offer promising avenues for bridging macro-level system design with micro-level behavioral processes (Neuhofer et al., 2015; Sigala, 2020). Taken together, these developments suggest that what may initially appear as fragmentation could, in fact, represent a transitional phase in the consolidation of the field.

This need for integration becomes particularly salient in the context of emerging economies. Unlike technologically advanced destinations, where digital infrastructures are relatively mature, emerging contexts are characterized by uneven technological adoption and more heterogeneous tourist profiles. Under such conditions, the effectiveness of smart tourism initiatives depends not only on technological deployment but also on how tourists perceive and adapt to these innovations. Therefore, an

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overreliance on technology-centered strategies may limit the potential impact of smart tourism if behavioral dimensions are not adequately considered.

Overall, the findings indicate that advancing smart tourism research requires a shift in analytical perspective. Rather than treating technology, data, and behavior as separate domains, future research should aim to develop integrative frameworks that explicitly connect these dimensions. In doing so, it becomes possible to better understand how digital infrastructures shape, and are in turn shaped by, tourist experiences and consumption decisions.

In this regard, the present study offers a conceptual contribution by reframing smart tourism not as an independent driver of behavior, but as a contextual condition within which tourist behavior is formed and negotiated. This perspective helps bridge existing gaps between technological and behavioral research streams, while also aligning smart tourism research with broader discussions on experience, co-creation, and human-centered innovation in tourism systems.

5. RESEARCH GAPS AND FUTURE RESEARCH DIRECTIONS

Despite the rapid growth of smart tourism research, the bibliometric findings reveal several persistent gaps that warrant further scholarly attention. First, a clear conceptual gap exists between technological capabilities and tourist consumption behavior. While digital infrastructures, smart systems, and data-driven tools are extensively examined, many studies stop short of explaining *how* and *why* these technologies translate into specific consumption outcomes. Future research should move beyond descriptive or adoption-focused approaches to develop integrative frameworks that explicitly link smart tourism technologies with tourists' cognitive, emotional, and behavioral responses.

Second, the literature remains fragmented across different levels of analysis. Destination-level studies often emphasize governance, infrastructure, and competitiveness, whereas individual-level research focuses on perception, satisfaction, and behavioral intention. However, empirical efforts that bridge these levels remain limited. Future studies could adopt multilevel research designs to examine how destination-level smart tourism strategies interact with individual tourist characteristics to shape consumption behavior. Such approaches would help overcome the current separation between macro-level planning and micro-level experience.

Third, although data-driven and computational methods have become increasingly prominent, their theoretical integration remains underdeveloped. Advanced techniques such as machine learning, sentiment analysis, and natural language processing are frequently employed as analytical tools rather than as components of theory-building efforts. Future research should seek to embed these methods within established or emerging theories of consumer behavior, decision-making, and experience co-creation, thereby enhancing both explanatory power and theoretical contribution.

Fourth, contextual gaps are particularly evident with respect to emerging economies. Much of the existing evidence is concentrated in technologically advanced destinations,

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where institutional support and digital readiness are relatively high. Research conducted in emerging economies remains comparatively scarce and often fragmented. Future studies should pay greater attention to contextual constraints, such as infrastructure inequality, institutional capacity, and diverse tourist segments, to better understand how smart tourism influences consumption behavior under less favorable conditions.

Finally, the evolving thematic landscape suggests opportunities to explore underdeveloped yet promising areas, including immersive technologies, human-centered design, and ethical dimensions of smart tourism. Topics such as trust in algorithmic systems, data privacy concerns, and perceived fairness of smart services remain marginal despite their relevance to consumption behavior. Addressing these gaps would contribute to a more comprehensive and socially grounded understanding of smart tourism.

6. IMPLICATIONS FOR THEORY AND PRACTICE

6.1. Theoretical implications

This study contributes to smart tourism research by reinterpreting the relationship between technology and tourist behavior. Rather than viewing smart tourism as a technology-driven process, the findings suggest that it should be understood as a socio-technical context in which value emerges through tourists' experiences and interpretations. In this sense, consumption behavior becomes a central analytical lens rather than a secondary outcome.

The results also highlight the importance of linking different levels of analysis. Existing research often separates destination-level capabilities from individual behavioral responses, limiting explanatory depth. Integrating perspectives from technology adoption, consumer behavior, and destination management may provide a more comprehensive understanding of how structural conditions shape tourist experiences and decisions.

More broadly, the study suggests that smart tourism should be conceptualized as a contextual condition influencing behavior, rather than an independent driver. This shift opens new directions for theory development related to experience co-creation and human-centered design.

6.2. Practical implications

The findings indicate that technological investment alone is insufficient to generate meaningful tourism outcomes. What matters is how technologies are experienced and interpreted by tourists in practice.

For destination managers, this implies a shift toward experience-oriented strategies. Smart tourism initiatives should focus not only on efficiency but also on enhancing satisfaction, trust, and engagement. This requires a deeper understanding of tourist expectations and behavioral adaptation across different contexts.

In emerging economies, the implications are more pronounced. Policymakers should complement technological development with digital literacy, institutional capacity building,

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and inclusive design. Without such alignment, smart tourism initiatives risk remaining technologically advanced but behaviorally ineffective.

Overall, integrating technological, managerial, and behavioral perspectives is essential for translating digital innovation into experiential value and competitive advantage.

7. CONCLUSION

This study provides a systematic overview of research on smart tourism and tourist consumption behavior from 2015 to 2025. The findings show that, although the field has grown rapidly, it remains fragmented across technology-oriented, data-driven, and behavior-focused perspectives.

At the same time, there is a clear shift toward more behaviorally informed research, with increasing emphasis on experience, decision-making, and engagement. This suggests a gradual transition from a technology-centered view toward a more integrated understanding of smart tourism.

The study highlights the need for frameworks that connect digital infrastructures, destination strategies, and tourist behavior. Such integration is particularly important in emerging economies, where contextual factors shape how technology influences consumption.

Despite certain limitations related to data scope, the study provides a foundation for future research. More importantly, it underscores a key insight: the value of smart tourism lies not in technology itself, but in how it is translated into meaningful tourist experiences.

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