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Extracting a Conceptual Model for the Development of Sustainable Smart Tourism Competitiveness: A Meta-Synthesis Study

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Abstract

The purpose of the present study is to extract a conceptual model for the development of sustainable smart tourism competitiveness using a meta-synthesis approach. In terms of purpose, this research is developmental, and in terms of nature, it is qualitative, conducted through a systematic meta-synthesis method. To this end, following a targeted search of معتبر domestic and international scientific databases and the application of inclusion and exclusion criteria, 36 scientific sources published between 2015 and 2025 were selected and subjected to in-depth analysis. The data were analyzed using open, axial, and selective coding. The findings led to the identification of seven core categories, including smart tourism infrastructure and technologies, data-driven management and intelligent decision-making, environmental, social, and economic sustainability, smart governance and stakeholder participation, tourist experience and smart value creation, sustainable smart tourism destination competitiveness, and destination readiness and maturity. The results indicate that the development of sustainable smart tourism competitiveness emerges from the systematic interaction among these categories, and that an exclusive focus on technology, without considering sustainability and governance dimensions, cannot generate sustainable competitive advantage. The extracted conceptual model can serve as a strategic tool for tourism managers and policymakers to support planning, evaluation, and the guidance of destinations toward sustainable competitiveness.

Keywords: Sustainable smart tourism, destination competitiveness, meta-synthesis, conceptual model, smart governance

1. Introduction

Tourism has entered a new phase of transformation under the combined influence of rapid technological advancement, global sustainability imperatives, and intensifying destination competition. Traditional models of tourism development, which primarily emphasized visitor numbers and short-term economic gains, have increasingly been criticized for generating environmental degradation, social imbalance, and vulnerability to economic shocks. In response, scholars and policymakers have progressively turned their attention toward sustainable tourism paradigms that balance economic viability with environmental stewardship and social well-being (Streimikiene et al., 2021; Unwto, 2018). Within this evolving landscape,

the concept of smart tourism has emerged as a strategic response that leverages digital technologies, data analytics, and intelligent systems to enhance destination performance, visitor experience, and governance effectiveness (Gretzel et al., 2015; Koo et al., 2021).

Smart tourism extends beyond the mere adoption of information and communication technologies; it represents a systemic transformation in how destinations are planned, managed, and experienced. By integrating technologies such as the Internet of Things (IoT), big data analytics, artificial intelligence, and cloud computing, smart tourism destinations can dynamically respond to visitor needs, optimize resource allocation, and support evidence-based decision-making (Suanpang & Pothipassa, 2024; Xu, 2023). This technological shift enables destinations to move from reactive management approaches toward predictive and adaptive models that are better suited to addressing complexity and uncertainty in contemporary tourism systems (Rosário & Dias, 2024; Wael et al., 2023).

Parallel to the rise of smart tourism, destination competitiveness has remained a central concern in tourism research. Competitiveness is commonly understood as a destination's ability to attract and satisfy visitors while maintaining or improving residents' quality of life and ensuring long-term economic prosperity (Cuong & Duy, 2021; Heydari et al., 2021). In an increasingly globalized tourism market, destinations are compelled to differentiate themselves not only through natural or cultural attractions but also through innovation capacity, service quality, governance structures, and sustainability performance (Shao & Yang, 2021; Simarmata et al., 2024). Consequently, competitiveness and sustainability are no longer viewed as conflicting objectives but as interdependent dimensions of successful destination development (González-Reverté, 2019; Streimikiene et al., 2021).

The convergence of smart tourism and sustainability has given rise to the notion of sustainable smart tourism, which emphasizes the strategic use of digital technologies to support environmental protection, social inclusion, and resilient economic growth. Research in this area highlights that smart solutions can significantly contribute to energy efficiency, waste reduction, congestion management, and community engagement when embedded within appropriate governance and policy frameworks (Cavalheiro et al., 2020; Shafiee et al., 2019). However, scholars also caution that technology alone cannot guarantee sustainability outcomes; rather, its effectiveness depends on institutional capacity, stakeholder collaboration, and alignment with broader development goals (Mora et al., 2019; Wahba, 2021).

Recent literature increasingly frames sustainable smart tourism competitiveness as a multidimensional and systemic phenomenon. Studies emphasize that competitive advantage in smart destinations emerges from the interaction among technological infrastructure, data-driven management, sustainability practices, governance mechanisms, and value co-creation with tourists and local communities (Gretzel & Koo, 2021; Lee et al., 2020). This perspective reflects a shift from linear models of competitiveness toward integrative frameworks that recognize tourism destinations as complex adaptive systems (El Archi et al., 2023; Qin, 2017). Within such systems, feedback loops between technology adoption, policy decisions, visitor behavior, and environmental outcomes play a critical role in shaping long-term performance.

Infrastructure and technology constitute one of the foundational pillars of smart tourism competitiveness. High-quality digital infrastructure, including broadband connectivity, sensor networks, geospatial information systems, and secure data platforms, enables destinations to collect, process, and utilize real-time information for strategic and operational purposes (Behzadi & Behzadi, 2025; Haqvardi Zadeh et al., 2023). Without reliable and secure technological foundations, other dimensions of smart tourism—such as personalization, automation, and intelligent decision support—remain fragmented or ineffective (Qin, 2017; Xu, 2023).

Equally important is the role of data-driven management and artificial intelligence in enhancing destination competitiveness. Advanced analytics and machine learning techniques allow destinations to forecast demand, manage visitor flows, personalize services, and anticipate crises, thereby improving efficiency and visitor satisfaction (Gretzel & Koo, 2021; Koo et al., 2021). These capabilities facilitate a transition from intuition-based decision-making toward evidence-based governance, which is particularly critical in environments characterized by volatility and uncertainty (Rosário & Dias, 2024; Suanpang & Pothipassa, 2024).

Sustainability dimensions—environmental, social, and economic—form another core component of sustainable smart tourism competitiveness. Empirical studies demonstrate that destinations integrating renewable energy, circular economy principles, social equity considerations, and local entrepreneurship into smart tourism strategies are more resilient and attractive in the long run (Garanti, 2023; Kusumastuti et al., 2024). Moreover, sustainability-oriented practices enhance destination image and brand equity, which in turn influence tourist loyalty and market positioning (Cuong & Duy, 2021; Simarmata et al., 2024). These findings underscore that sustainability should be treated not as an external constraint but as an intrinsic driver of competitiveness.

Governance and stakeholder participation are repeatedly identified as enabling conditions for the success of sustainable smart tourism. Smart governance involves policy integration across tourism, urban development, and technology sectors, as well as transparent decision-making and collaborative partnerships among public authorities, private firms, academic institutions, and local communities (Cavalheiro et al., 2020; Wahba, 2021). The literature suggests that destinations with inclusive governance structures are better positioned to align technological innovation with societal needs and sustainability objectives (El Archi et al., 2023; Mora et al., 2019).

Another critical dimension concerns tourist experience and smart value creation. Smart technologies reshape how tourists interact with destinations by enabling personalized itineraries, immersive experiences through augmented and virtual reality, seamless mobility, and enhanced perceptions of safety and convenience (Lee et al., 2020; Shao & Yang, 2021). Positive experiences not only increase satisfaction and loyalty but also generate valuable data that feed back into destination management systems, reinforcing competitive advantage (Gretzel et al., 2015; Koo et al., 2021). Accessibility and inclusiveness, particularly for vulnerable groups, further strengthen the social legitimacy and competitiveness of smart destinations (Heydari et al., 2021; Taimouri et al., 2024).

Despite growing scholarly attention, the literature reveals fragmentation in conceptualizing and operationalizing sustainable smart tourism competitiveness. While some studies focus on technological readiness, others emphasize sustainability outcomes, governance models, or market performance indicators (González-Reverté, 2019; Shafiee et al., 2019). Moreover, recent contributions highlight the importance of destination readiness, maturity, and transformation pathways, suggesting that smart tourism development is a gradual process requiring continuous assessment and learning (Cruz, 2025; Franz & Cruz, 2025; Garanti, 2023). Maturity models are increasingly proposed as tools to guide destinations in transitioning from traditional tourism systems toward integrated and sustainable smart tourism configurations (Cruz, 2025; Leong et al., 2024).

Within this context, there is a clear need for integrative frameworks that synthesize existing knowledge and clarify the interrelationships among the multiple dimensions of sustainable smart tourism competitiveness. Systematic reviews and meta-synthesis studies have proven valuable in consolidating fragmented research streams and generating higher-order conceptual models that support theory development and practical decision-making (El Archi et al., 2023; Rosário & Dias, 2024). By comparing and integrating findings across diverse empirical and conceptual studies, meta-synthesis enables the identification of core categories, underlying mechanisms, and research gaps in complex fields such as smart tourism (Gretzel et al., 2015; Shafiee et al., 2019).

Given the accelerating pace of digital transformation, the increasing urgency of sustainability challenges, and the intensifying competition among tourism destinations, developing a coherent conceptual model for sustainable smart tourism competitiveness is both timely and necessary. Such a model can provide strategic guidance for policymakers, destination managers, and planners seeking to harness smart technologies in ways that generate long-term competitive advantage while aligning with sustainability principles (Unwto, 2018; Wahba, 2021). Moreover, it can contribute to advancing tourism theory by integrating insights from smart tourism, sustainable development, and competitiveness research into a unified analytical framework (Simarmata et al., 2024; Streimikiene et al., 2021).

Accordingly, the aim of this study is to extract and develop a comprehensive conceptual model of sustainable smart tourism competitiveness through a systematic meta-synthesis of the existing literature.

2. Methods and Materials

In this study, the meta-synthesis method was employed to extract a conceptual model for the development of sustainable smart tourism competitiveness. Meta-synthesis is a qualitative research approach in which qualitative studies are integrated, and their similarities and differences are compared, ultimately generating a new interpretation of the collective body of research. This interpretation can lead to a more comprehensive explanation of the phenomenon under investigation. Meta-synthesis supports evidence-based decision-making and practice by grounding judgments in scientific evidence and research findings, and it facilitates the utilization of qualitative research in applied domains. By providing a systematic perspective through the integration of multiple qualitative studies, meta-synthesis enables researchers to discover new and fundamental themes and metaphors, thereby advancing existing knowledge and offering a holistic and comprehensive view of complex issues (Niroomand & et al., 2012). The three main objectives of meta-synthesis include theory building, theory explication, and conceptual development.

In general, two dominant perspectives govern meta-synthesis. The first, known as the *integrative approach*, emphasizes the collection, aggregation, and integration of previous studies by identifying commonalities among earlier findings and synthesizing them based on highly reliable variables, often leading to causal explanations among phenomena and enhanced generalizability of results. The second perspective, referred to as *interpretive synthesis*, emphasizes the interpretation and re-interpretation of prior studies. In this view, comparison and interpretation are central, as an inductive process is used to anticipate what may occur under similar conditions and to explain how categories are related to or interact with one another.

Noblit and Hare proposed three main phases for meta-synthesis—study selection, translation synthesis, and synthesis presentation—while Sandelowski and Barroso introduced a seven-step methodological framework (Sandelowski & Barroso, 2007). In the present study, the seven-step method proposed by Sandelowski and Barroso was adopted. The steps followed in this research are described below.

Stage 1: Formulation of the Research Question

In the present study, the fundamental research question addressed was: *What is the model for developing sustainable smart tourism competitiveness?*

Stage 2: Systematic Review

The literature corpus of the present study included all scientific and research documents published between 2015 and 2025 in the field of tourism studies that addressed sustainable smart tourism and competitiveness in this domain. Relevant keywords—including smart tourism, sustainable smart tourism, competitiveness in smart tourism, and smart tourism models—were searched in scientific databases and search engines such as IranDoc, Noormags, MagIran, Civilica, ScienceDirect, Google Scholar, Emerald, and ERIC.

The inclusion and exclusion criteria for article selection are presented in Table 1.

Table 1. Article Inclusion and Exclusion Criteria

Criterion	Inclusion Criteria	Exclusion Criteria
Language of publication	English or Persian	Languages other than English or Persian
Time period	2015–2025	Prior to 2015
Research method	Qualitative studies and mixed-methods (qualitative–quantitative) studies related to concept and dimension extraction	Purely quantitative studies lacking conceptual or theoretical analysis
Study domain	Studies related to smart tourism, sustainable tourism, and sustainable smart tourism	Studies unrelated to smart tourism or lacking a sustainability linkage
Focus of analysis	Studies addressing competitiveness, development, competitive advantage, or destination performance within sustainable smart tourism	Studies focusing on issues outside sustainable smart tourism competitiveness development
Type of publication	Peer-reviewed journal articles (ISI/Scopus), reports and official documents from reputable international organizations (e.g., UNWTO, OECD, WEF)	Notes, personal opinions, non-scholarly articles, non-peer-reviewed or unpublished sources

Stage 3: Search and Selection of Relevant Studies

To investigate the research topic, a systematic and rule-based process was first applied to examine the research trends, scientific scope, and knowledge map of this field. Initially, Google Trends software was used to analyze trends in the topic, followed by consultation of the Ministry of Science journal ranking system to identify reputable scientific journals and prioritize core articles. Based on searches for the keyword *sustainable smart tourism* in Google Trends, global interest over the past five

years followed the pattern shown in Figure 1, with the highest search frequencies observed in the countries presented in Figure 2.

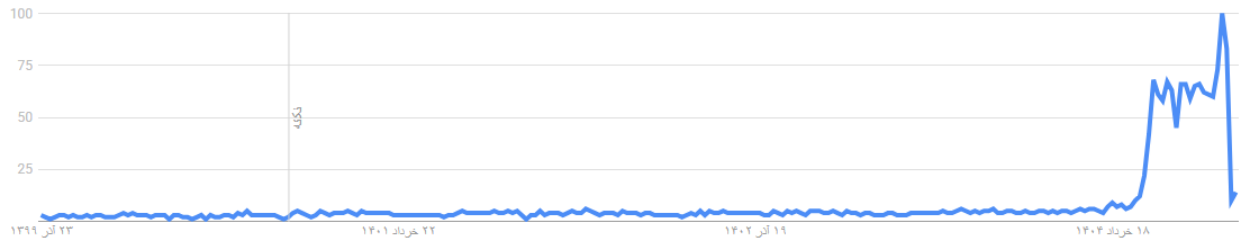

Figure 1. Global search trend for the keyword "sustainable smart tourism" from 2021 to 2025

Figure 2. Geographic distribution of searches for the keyword "sustainable smart tourism" from 2021 to 2025

Accordingly, to ensure the use of credible domestic and international sources, searches were conducted in databases such as Scopus, Elsevier, and Google Scholar. A total of 138 articles were initially identified based on title and topic relevance. Of these, 42 documents were excluded because their titles and subject matter were not aligned with the focus of the present study. The remaining 96 articles underwent abstract screening, during which 39 additional articles were excluded. Subsequently, a rapid review of full texts and key thematic axes led to the exclusion of 23 more articles. Ultimately, 34 articles remained for final analysis, and their results constituted the empirical foundation of the present study.

Stage 4: Data Extraction from Selected Studies

At this stage, an in-depth review of the selected studies was conducted. To address the research question and extract a model for sustainable smart tourism competitiveness development, a data extraction process was undertaken. Given the qualitative nature of the data (textual materials), open coding was employed.

Stage 5: Analysis and Synthesis of Qualitative Findings

For data analysis, subcategories and core categories were utilized. Coding began with repeated readings of the texts at the line and paragraph levels to develop an overall understanding. Subsequently, the texts were examined word by word to extract codes. As codes were identified, the researcher developed a classification scheme by grouping similar and related codes into categories that best described them, thereby forming conceptual structures.

Table 2. Core Categories of Sustainable Smart Tourism Development

Core Category	Subcategories	Sources	Frequency
Smart tourism infrastructure and technologies	Communication infrastructure and broadband; GIS and open destination data; cybersecurity and tourist privacy; smart equipment and environmental sensors (IoT); data centers and cloud technology support; technology integration in transportation and accommodation services	Buhalis & Amaranggana (2015); Suanpang et al. (2024); Kine (2017); Axo (2023); Haghverdi-Zadeh et al. (2023); Behzadi & Behzadi (2025)	6
Data-driven management, artificial intelligence, and intelligent decision-making	Big data analytics for tourist behavior prediction; machine learning algorithms for service personalization; AI use in crisis and congestion management; NLP-based recommender systems; sentiment and feedback analysis from social media	Gretzel & Koo (2021); Abseri et al. (2025); Koo et al. (2021); Suanpang et al. (2024); Nematpour et al. (2024); Axo (2023); Haghverdi-Zadeh et al. (2023)	7

Environmental, social, and economic sustainability in smart tourism	Renewable energy and green infrastructure; smart waste and water resource management; social welfare and spatial justice; local entrepreneurship and circular economy; economic resilience to crises; environmental education and awareness	Granty (2023); Aldrich et al. (2023); UNWTO (2021); González (2019); Casamastudi et al. (2024); Franz et al. (2025); Strömicken et al. (2021); Shafiei et al. (2019); Attaei et al. (2024); Haghverdi-Zadeh et al. (2023)	10
Smart governance and stakeholder participation	Policy integration among tourism, urban, and technology institutions; collaborative models among government, private sector, and universities; digital leadership and institutional transparency; legal frameworks supporting innovation and entrepreneurship; role of municipalities and local governance; linkage between sustainable smart cities and competitiveness; digital citizenship and public participation	Cavaleiro et al. (2020); Mora et al. (2019); Wahba (2021); González (2021); Naeimabadi et al. (2023); Ebrahim-Pour et al. (2022)	6
Tourist experience and smart value creation	Personalized travel design; enhanced engagement through AR/VR tools; perceived quality of digital experience and usability; trust, security, and well-being during travel; loyalty and positive word-of-mouth; accessibility for people with disabilities	Lee et al. (2020); Koo et al. (2021); Suanpang et al. (2024); Shao & Yang (2021); Teymouri et al. (2024); Heydari et al. (2021)	6
Sustainable smart tourism destination competitiveness	Innovation-based competitive advantage; destination brand equity and image; productivity of human capital and tech-based businesses; service quality and repeat visitation; economic performance, market share, and sustainable growth	Shao & Yan (2021); Kong & Dai (2021); Simarmata et al. (2024); Nematpour et al. (2024); Amrallah et al. (2023); Delshad et al. (2021); Behzadi et al. (2025); Heydari et al. (2021)	8
Destination readiness, maturity, and transformation pathway	Assessment of technological and managerial maturity; evaluation of digital readiness and innovation indicators; gradual transition from traditional to smart tourism; long-term monitoring of sustainable development	Abseri et al. (2025); Franz et al. (2025); Granty (2023); Shafiei et al. (2019); Teymouri et al. (2024); Heydari et al. (2021)	6

Table 2 represents the outcome of the systematic meta-synthesis of domestic and international studies related to the development of sustainable smart tourism competitiveness. In this table, concepts and data extracted from the abstracts and full texts of reputable articles were coded, comparatively analyzed, and conceptually integrated, resulting in the organization of findings into seven core categories. Each core category represents a key dimension shaping sustainable smart tourism destination competitiveness and encompasses a set of thematically related subcategories reflecting the interconnections among smart technologies, governance, sustainability, tourist experience, and institutional capacities. The frequency of each category indicates its recurrence and emphasis in the research literature and is considered an indicator of its relative importance and theoretical saturation. Accordingly, this table presents the final semantic network derived from the meta-synthesis and serves as the foundation for extracting the conceptual model of sustainable smart tourism competitiveness development in this study.

Stage 6: Quality Control

To ensure the trustworthiness of the research data, a peer-debriefing strategy was employed, whereby research colleagues reviewed and validated the analytical process and findings.

3. Findings and Results

Stage Seven: Presentation of Findings

In this study, the factors related to competitiveness in the development of sustainable smart tourism that were extracted from the texts of the selected studies were considered as conceptual elements. Their classification into similar groups led to the emergence of categories, which were ultimately integrated into a comprehensive description of the research phenomenon and formed the dimensions of sustainable smart tourism. Accordingly, the conceptual model of competitiveness in the development of sustainable smart tourism was derived and is presented in Figure 3.

Figure 3. Conceptual Model of Competitiveness in the Development of Sustainable Smart Tourism

The findings obtained from the systematic meta-synthesis process indicate that the development of sustainable smart tourism competitiveness is a multidimensional and interdisciplinary concept that emerges from the synergy among smart technologies, governance mechanisms, sustainability dimensions, tourist experience, and the institutional capacities of destinations. The conceptual analysis and integration of the selected sources led to the identification of seven main core categories, each representing a key dimension of destination competitiveness within the context of sustainable smart tourism.

1. Smart Tourism Infrastructure and Technologies

Based on the findings, technological infrastructure was identified as the most fundamental component of competitiveness in smart tourism destinations. Categories such as communication infrastructure and broadband, geographic information systems, cybersecurity, the Internet of Things, and cloud technologies were repeatedly emphasized across a substantial proportion of the reviewed studies (frequency = 6). These findings suggest that without stable and secure digital infrastructure, the implementation of other smart tourism components is practically unfeasible, resulting in a weakened competitive capacity of the destination.

2. Data-Driven Management, Artificial Intelligence, and Intelligent Decision-Making

The second core category relates to the role of data and artificial intelligence in destination-level decision-making. The results show that big data analytics, recommender systems, machine learning, and tourist sentiment analysis play a decisive role in predicting tourist behavior, managing congestion, and enhancing the travel experience (frequency = 7). This category reflects a transition from traditional management approaches toward predictive and data-driven management in sustainable smart tourism destinations.

3. Environmental, Social, and Economic Sustainability

The meta-synthesis findings indicate that sustainability is not merely an outcome but a central pillar of smart destination competitiveness. Subcategories such as renewable energy, smart resource management, social justice, local entrepreneurship, and economic resilience exhibited the highest level of conceptual diversity among all categories (frequency = 10). These results

demonstrate that sustainable competitiveness is achieved when environmental and social considerations are placed at the core of smart tourism development policies.

4. Smart Governance and Stakeholder Participation

The analysis of findings revealed that smart governance plays a facilitating and driving role in the success of sustainable smart tourism. Policy coordination among different institutions, legal frameworks, the participation of government, the private sector, and universities, as well as the role of local management, were among the most frequently coded elements within this category (frequency = 6). This finding emphasizes that technology alone, in the absence of appropriate governance structures, cannot lead to sustainable competitiveness.

5. Tourist Experience and Smart Value Creation

The results indicate that tourist experience constitutes the focal point of value creation in smart destinations. Service personalization, the use of augmented and virtual reality technologies, perceived security and trust, and accessibility for persons with disabilities were identified as key factors influencing tourist satisfaction and loyalty (frequency = 6). This category highlights that a strong focus on the quality of both digital and physical tourist experiences plays a direct role in strengthening the competitive advantage of destinations.

6. Sustainable Smart Tourism Destination Competitiveness

Within this category, research findings suggest that competitiveness is the outcome of interaction among technological innovation, service quality, human capital, and destination image (frequency = 8). Economic performance, sustainable growth, and market share were emphasized as the ultimate outcomes of sustainable smart tourism development. These findings indicate a direct linkage between the technological capacities of destinations and their economic outcomes.

7. Destination Readiness, Maturity, and Transformation Pathway

The meta-synthesis findings demonstrate that sustainable smart tourism development is a gradual and staged process. Assessing technological maturity, managerial readiness, and continuous monitoring of sustainable development were identified as key components of this category (frequency = 6). These results underscore the necessity of employing maturity models to guide destinations along the transition from traditional tourism systems toward sustainable smart tourism.

Overall, the findings of this study indicate that the development of sustainable smart tourism competitiveness results from the systematic interaction among technological infrastructure, data-driven management, multidimensional sustainability, smart governance, tourist experience, and institutional readiness of destinations. These seven core categories form a coherent conceptual framework that serves as the basis for extracting the study's conceptual model in the subsequent section.

4. Discussion and Conclusion

The findings of the present study provide a comprehensive and integrative understanding of sustainable smart tourism competitiveness by demonstrating that competitiveness in this context is not the result of a single dominant factor, but rather emerges from the dynamic interaction among technological, managerial, governance-related, sustainability-oriented, experiential, and institutional dimensions. The extracted conceptual model confirms that sustainable smart tourism competitiveness is inherently multidimensional and systemic, aligning with prior research that conceptualizes smart destinations as complex adaptive systems rather than linear technological projects (Gretzel et al., 2015; Koo et al., 2021). The results reinforce the argument that smart tourism development must be understood as a holistic transformation process in which digital technologies serve as enablers rather than ends in themselves. In this regard, the prominence of smart tourism infrastructure and technologies as a foundational category supports earlier studies emphasizing that advanced ICT infrastructure, broadband connectivity, sensor networks, and secure data platforms constitute the necessary backbone for any smart tourism initiative (Behzadi & Behzadi, 2025; Qin, 2017). Without such infrastructural readiness, destinations lack the capacity to operationalize data-driven management, personalization, and intelligent service delivery, thereby weakening their competitive position in increasingly technology-driven tourism markets.

At the same time, the findings highlight that infrastructure alone is insufficient to generate sustainable competitive advantage, a conclusion that is consistent with research stressing the complementary role of data-driven management and artificial intelligence. The strong emphasis on big data analytics, machine learning, recommender systems, and predictive decision-making reflects a broader shift from reactive and intuition-based destination management toward anticipatory and

evidence-based governance (Gretzel & Koo, 2021; Xu, 2023). By enabling destinations to forecast demand, manage congestion, optimize resource allocation, and personalize tourist experiences, data-driven approaches enhance both operational efficiency and visitor satisfaction. This finding aligns with studies showing that intelligent decision-support systems significantly improve destination responsiveness and resilience, particularly under conditions of uncertainty and crisis (Rosário & Dias, 2024; Suanpang & Pothipassa, 2024). The present results therefore extend existing knowledge by situating artificial intelligence and data analytics not merely as technological innovations, but as strategic drivers of sustainable competitiveness in smart tourism destinations.

Another key contribution of this study lies in clarifying the central role of environmental, social, and economic sustainability in shaping smart tourism competitiveness. The high conceptual diversity and frequency associated with sustainability-related subcategories indicate that sustainability is not a peripheral outcome, but a core pillar of competitiveness in smart tourism contexts. This finding strongly supports prior literature arguing that long-term destination competitiveness is inseparable from sustainable development principles (Streimikiene et al., 2021; Unwto, 2018). The integration of renewable energy, smart resource management, circular economy practices, social equity, and economic resilience reflects a growing recognition that destinations capable of balancing technological innovation with environmental stewardship and social inclusion are better positioned to withstand external shocks and maintain market attractiveness (Garanti, 2023; Kusumastuti et al., 2024). Moreover, the results resonate with research demonstrating that sustainability-oriented smart destinations benefit from enhanced destination image and brand equity, which in turn foster tourist loyalty and repeat visitation (Cuong & Duy, 2021; Simarmata et al., 2024).

The findings further underscore the critical importance of smart governance and stakeholder participation as enabling mechanisms for sustainable smart tourism competitiveness. The repeated emphasis on policy coordination, legal frameworks, collaborative partnerships, and local governance structures confirms that governance quality significantly conditions the effectiveness of smart tourism initiatives. This result aligns with studies suggesting that technological innovation without appropriate governance arrangements often leads to fragmented implementation, social resistance, or unsustainable outcomes (Mora et al., 2019; Wahba, 2021). In contrast, destinations that foster inclusive governance models—bringing together public authorities, private sector actors, academic institutions, and local communities—are more capable of aligning technological investments with sustainability objectives and societal needs (Cavalheiro et al., 2020; El Archi et al., 2023). The present study contributes to this stream of research by empirically reinforcing the view that smart governance functions as a mediating force through which technology and sustainability are translated into tangible competitive advantages.

Tourist experience and smart value creation also emerged as a central dimension of the competitiveness model, highlighting the demand-side implications of sustainable smart tourism development. The findings indicate that personalization, immersive technologies, perceived security, trust, and accessibility play decisive roles in shaping tourist satisfaction and loyalty. This supports prior research emphasizing that smart tourism ultimately derives its value from enhancing the quality of tourist experiences, rather than merely improving operational efficiency (Lee et al., 2020; Shao & Yang, 2021). By enabling tailored services, seamless mobility, and interactive engagement, smart technologies facilitate deeper emotional and cognitive connections between tourists and destinations. Furthermore, the focus on accessibility and inclusiveness reinforces arguments that socially responsible smart tourism practices strengthen both the ethical legitimacy and competitive appeal of destinations (Heydari et al., 2021; Taimouri et al., 2024). These results suggest that destinations prioritizing experiential quality alongside technological sophistication are more likely to achieve sustainable competitive differentiation.

The category of sustainable smart tourism destination competitiveness synthesizes the cumulative effects of technological innovation, service quality, human capital, and destination image into measurable economic and market outcomes. The findings demonstrate that competitiveness manifests through improved economic performance, market share growth, and long-term resilience, thereby confirming earlier models that link destination competitiveness to both tangible and intangible resources (Cuong & Duy, 2021; Simarmata et al., 2024). Importantly, the results highlight that technological capabilities must be embedded within broader organizational and institutional contexts to translate into economic benefits. This observation aligns with resource-based and capability-based perspectives, which argue that sustainable competitive advantage arises from the effective orchestration of resources rather than their mere possession (Shao & Yang, 2021; Simarmata et al., 2024).

Finally, the emphasis on destination readiness, maturity, and transformation pathways provides important insights into the temporal and evolutionary nature of sustainable smart tourism development. The findings confirm that smart tourism competitiveness does not emerge instantaneously, but evolves through gradual stages of technological, managerial, and institutional learning. This result supports recent scholarship advocating for maturity models as tools to guide destinations through phased transitions from traditional tourism systems toward integrated and sustainable smart tourism configurations (Cruz, 2025; Franz & Cruz, 2025). By highlighting the need for continuous monitoring, evaluation, and adaptation, the study reinforces the argument that sustainable smart tourism is an ongoing process rather than a fixed end state (Garanti, 2023; Leong et al., 2024). Collectively, these findings contribute to the literature by offering a coherent conceptual framework that integrates fragmented research streams into a unified model of sustainable smart tourism competitiveness.

Despite the contributions of this study, several limitations should be acknowledged. First, the research relied on a meta-synthesis of existing studies, which means that the findings are inherently dependent on the scope, quality, and methodological diversity of the selected literature. Second, although the study integrated international and regional research, contextual differences among destinations may limit the direct applicability of the model to all tourism settings. Third, the qualitative nature of the synthesis does not allow for empirical testing of causal relationships among the identified dimensions, which constrains the ability to assess their relative strength and interaction effects quantitatively.

Future research can build on the present study in several ways. Empirical validation of the proposed conceptual model through quantitative methods, such as structural equation modeling or mixed-methods designs, would strengthen its explanatory and predictive power. Comparative studies across different geographical regions and destination types could further refine the model by identifying context-specific pathways to sustainable smart tourism competitiveness. In addition, longitudinal research examining how destinations progress through different maturity stages over time would provide valuable insights into the dynamics of smart tourism transformation.

From a practical perspective, the findings offer several implications for policymakers and destination managers. Decision-makers should adopt integrated strategies that simultaneously address technological infrastructure, data-driven management, sustainability, governance, and tourist experience rather than pursuing isolated smart projects. Investment in digital infrastructure should be accompanied by capacity building, stakeholder engagement, and clear governance frameworks to ensure that technological innovations translate into sustainable competitive advantages. Moreover, destinations should use maturity assessment tools to evaluate their current position and design phased development roadmaps that align smart tourism initiatives with long-term sustainability goals.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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