Journal of Global Tourism and Technology Research

ISSN: 2717-6924
https://dergipark.org.tr/en/pub/jgttr

DOI: 10.54493/jgttr.1894198

Year: 2026 Volume: 7 Issue: 1 Yıl: 2026 Cilt: 7 Sayı: 1

Review Article

Strategic Integration of Technology-Driven Sport Events into Local Sustainable Tourism Development

Erhan Nuh ÖZTÜRK[1]

ARTICLE INFO

Background:
Received: 20.02.2026
Accepted: 16.03.2026
Published: 30.03.2026

Keywords:
Sport tourism,
Digital transformation,
Sustainable tourism development,
Smart event management

ABSTRACT

Sport events have increasingly become important instruments in local tourism strategies, particularly in destinations seeking sustainable and diversified development paths. At the same time, the rapid expansion of digital technologies has transformed how events are planned, monitored, and evaluated. This conceptual study examines how technology-driven sport events can be strategically integrated into local sustainable tourism development. Rather than focusing solely on economic impacts, the study considers governance structures, stakeholder coordination, data-based decision-making, and environmental management. Drawing on recent literature in sport tourism, digital transformation, and sustainable destination management, the paper argues that technological infrastructure such as smart ticketing systems, real-time monitoring tools, digital marketing platforms, and sustainability reporting mechanisms can enhance both efficiency and long-term legacy outcomes. The study proposes a strategic integration framework that connects digital capacity, local institutional structures, and sustainability objectives. The proposed framework is further illustrated through a case study of the Barcelona Marathon, demonstrating the practical applicability of digital integration in enhancing destination resilience and sustainability. It suggests that without systematic integration, technology remains operational rather than transformative. The paper concludes by outlining policy implications for local governments, destination managers, and event organizers aiming to align sport events with sustainable tourism goals.

Introduction

Tourism destinations today operate in an environment characterized by intense competition and pervasive technological saturation. While natural and cultural attractions have historically formed the foundation of destination appeal, contemporary travelers increasingly expect digitally enhanced experiences, data-driven services, and demonstrable commitment to sustainable management practices. This fundamental shift in visitor expectations has compelled destination managers to reconsider not only their marketing strategies but also their infrastructure investments, institutional capacities, and stakeholder collaboration frameworks. In this rapidly evolving landscape, the ability to integrate technological innovation with sustainability principles has become a critical determinant of destination competitiveness.

Within this transformative context, sport events have garnered renewed attention as strategic instruments capable of stimulating local tourism economies, strengthening place identity, and generating diversified economic activities (Getz, 2008; Higham & Hinch, 2009). Unlike conventional tourism attractions that operate continuously, sport events create concentrated periods of visitor influx that can extend beyond traditional peak seasons, thereby addressing one of the most persistent challenges faced by tourism destinations, namely seasonality. Beyond their economic contributions, these events serve as platforms for community engagement, fostering social cohesion and local pride while simultaneously projecting destination images to global audiences through media coverage. The organizational

[1]PhD, Lecturer, Karamanoğlu Mehmetbey University, Ermenek Vocational School, Department of Management and Organization, enuhozturk@kmu.edu.tr, ORCID No: 0000-0001-5070-8195

Cite as: Öztürk, E.N. (2026). Strategic Integration of Technology-Driven Sport Events into Local Sustainable Tourism Development. *Journal of Global Tourism and Technology Research, 7*(1), 79-88.
"Ethics committee approval is not required for this study."

processes surrounding sport events also generate valuable networks among public authorities, private enterprises, civil society organizations, and local residents, thereby enhancing the broader governance capacity of destinations.

Parallel to developments in sport tourism, the rapid evolution of digital technologies has fundamentally transformed how tourism products are conceptualized, delivered, and evaluated (Buhalis & Law, 2008). While earlier stages of digitalization primarily focused on internet connectivity and online distribution channels, recent advances have introduced artificial intelligence, real-time data ecosystems, and integrated smart infrastructures into tourism management. These developments are increasingly shaping the organization and strategic management of sport events, enabling destinations to enhance operational efficiency, visitor experience, and long-term resilience (Rossini et al., 2024). Advances in Information and Communication Technologies now enable destinations to collect real-time data on visitor movements, monitor resource consumption patterns, optimize operational efficiency, and personalize service delivery at unprecedented scales (Gretzel et al., 2015; Xiang et al., 2015). These technological capabilities extend far beyond mere operational improvements. They fundamentally reshape the visitor experience through mobile applications, augmented reality interfaces, smart mobility solutions, and personalized recommendation systems. The emergence of the "smart destination" concept reflects this paradigm shift, emphasizing interconnected infrastructure systems, multi-stakeholder collaboration, and data-driven decision-making as foundational pillars of sustainable competitiveness in contemporary tourism (Buhalis & Amaranggana, 2014).

The intersection of these two dynamics, namely the strategic deployment of sport events and the transformative potential of digital technologies, creates both unprecedented opportunities and complex managerial challenges for local sustainable tourism development. Sport events, by their very nature, are technology-intensive undertakings that require sophisticated systems for ticketing, security, athlete performance tracking, spectator engagement, and operational logistics. These technological infrastructures, along with the data they generate and the digital capacities they develop, possess significant potential to contribute to destination sustainability well beyond the temporal boundaries of the events themselves. For instance, crowd management systems deployed during a marathon event can evolve into permanent urban monitoring capabilities applicable to future tourism activities. However, realizing this potential requires deliberate strategic alignment between event-driven technological investments and long-term destination sustainability objectives, a connection that remains remarkably underdeveloped in both academic literature and practical application.

Sport tourism scholarship has long recognized events as a distinct and expanding segment of the tourism industry (Gibson, 1998). From community-based running festivals to international championships, sport events generate visitor expenditures, extend tourism seasons, and contribute to local economic multipliers (Higham, 1999). Yet the sustainability of these benefits depends critically on governance structures, community participation mechanisms, and strategic planning processes (Bramwell & Lane, 2007). While mega-events such as the Olympic Games and FIFA World Cup have received extensive scholarly attention regarding their legacy formation and economic impacts (Preuss, 2007), smaller-scale and recurring sport events have attracted comparatively limited academic interest, particularly concerning their integration with digital transformation and long-term sustainability frameworks. This oversight is significant because smaller events are typically more deeply embedded in local social fabrics, demonstrate stronger community engagement, and require more modest infrastructure investments.

The concept of smart tourism has emerged as a central theme in contemporary tourism research, emphasizing the role of information and communication technologies in enabling destinations to collect real-time data, monitor visitor behaviors, optimize resource allocation, and personalize service delivery (Gretzel et al., 2015). The smart destination paradigm envisions interconnected technological infrastructures, collaborative governance arrangements, and evidence-based decision-making as essential components of sustainable competitiveness (Buhalis & Amaranggana, 2014). Despite the rapid expansion of this literature, its specific application to sport event management within local tourism systems remains surprisingly fragmented. Current technological applications in sport events predominantly focus on consumer-facing innovations, enhancing spectator experiences, facilitating ticket purchases, or enabling social media engagement, while neglecting the backend governance capabilities, environmental monitoring systems, and institutional learning processes that are essential for translating temporary event activities into lasting destination benefits.

The research problem addressed in this study emerges precisely from this conceptual and practical gap. Although sport events are consistently promoted as catalysts for local development, and digital technologies are increasingly

integrated into tourism operations, there exists limited conceptual clarity regarding how technology-driven sport events can be strategically embedded within local sustainable tourism frameworks. In numerous cases, digital applications such as online ticketing platforms, social media marketing campaigns, or participant tracking systems are adopted at operational levels without systematic alignment with broader sustainability objectives encompassing environmental protection, social inclusion, and institutional capacity building. Consequently, while technology improves operational efficiency in discrete areas, it fails to generate structural transformation or enduring value for host communities. This situation reveals a pressing need to transition from isolated digital tools toward integrated digital ecosystems that actively support local social well-being, environmental stewardship, and adaptive governance capacity.

The purpose of this study is therefore to conceptually examine how technology-driven sport events can be strategically integrated into local sustainable tourism development. Rather than concentrating exclusively on economic impact assessment, this investigation adopts a more comprehensive perspective that encompasses governance structures, stakeholder coordination mechanisms, environmental management practices, and legacy planning processes within a digital transformation framework. By synthesizing insights from sport tourism scholarship, sustainable destination management literature, and smart tourism research, the paper develops a strategic integration framework that systematically connects digital capacity with local development objectives. The significance of this study resides in its attempt to provide destination managers, event organizers, and local policymakers with a coherent roadmap for leveraging sport events as drivers of both digital innovation and sustainable transformation, thereby transforming sport events from episodic attractions into enduring instruments of destination development.

Literature Review

Sport tourism has gradually evolved into a significant sub-field within tourism studies, attracting sustained attention from both scholars and policymakers. Gibson (1998) initially conceptualized sport tourism as travel that involves either active participation in sport or attendance at sporting events, and since that foundational definition, the field has expanded to encompass economic impact analysis, destination branding, community development, and sustainability considerations (Higham & Hinch, 2009). Early contributions largely emphasized the economic benefits generated by sport-related travel, particularly in terms of visitor expenditure and regional promotion, but over time the literature has shifted toward a more balanced perspective that incorporates environmental responsibility and socio-cultural implications alongside economic performance. This evolution reflects the broader sustainable tourism paradigm, strongly influenced by Butler's (1999) state-of-the-art review, which underscores the necessity of aligning tourism development with long-term environmental protection and community well-being. Within this framework, sport events are frequently positioned as instruments capable of diversifying tourism products and mitigating seasonality, particularly in small and medium-sized destinations (Getz, 2008). In recent years, however, sport tourism has evolved beyond these foundational definitions as technological innovations increasingly shape the design and delivery of sport events. Digital tools such as mobile applications, smart ticketing systems, and real-time participant tracking technologies are transforming event experiences from passive spectatorship to digitally mediated participation (Csobán, 2022). Nevertheless, the sustainability of such initiatives depends not merely on visitor numbers or media visibility, but on governance quality, stakeholder engagement, and institutional capacity (Bramwell & Lane, 2007). When sport events are organized without integrated planning or long-term vision, they risk producing short-lived economic inflows without generating durable developmental benefits.

Mega-events such as the Olympic Games have received extensive scholarly attention, particularly in relation to legacy formation and impact measurement (Preuss, 2007). While these large-scale events offer high international visibility, their infrastructural demands and financial risks have prompted critical debate. In contrast, smaller-scale and recurring sport events often demonstrate closer alignment with sustainability principles. Their comparatively modest infrastructure requirements, lower environmental pressures, and stronger community participation may enhance social cohesion and reinforce place identity. These characteristics make them inherently more compatible with sustainability principles and ideally suited for testing community-oriented digital innovations. Despite this potential, systematic connections between small-scale sport events and digital transformation processes remain remarkably limited in the literature, representing a significant gap given the growing emphasis on smart destination management.

Parallel to developments in sport tourism, the digital transformation of tourism has profoundly reshaped the industry over the past two decades. Buhalis and Law (2008) explain how information technologies have restructured distribution systems, marketing strategies, and consumer decision-making processes, while the proliferation of mobile devices, online platforms, and data analytics has altered not only how tourists plan and experience travel but also how destinations manage resources and evaluate performance. Building upon these technological shifts, the concept of smart tourism has emerged as a comprehensive framework for understanding digitally enabled destination management. Gretzel et al. (2015) conceptualize smart tourism as an ecosystem in which physical infrastructure, social networks, governmental institutions, and digital technologies interact to co-create value, with data collection and real-time monitoring supporting adaptive management and evidence-based policymaking. Buhalis and Amaranggana (2014) argue that smart destinations integrate technological infrastructure with stakeholder collaboration in order to enhance both competitiveness and sustainability. Building on this perspective, the integration of technology-driven sport events within smart destination systems enables more data-driven and adaptive governance practices. Digital platforms, real-time monitoring systems, and integrated information infrastructures allow destinations to manage temporary event-related visitor influxes while aligning these activities with long-term sustainability objectives and local policy priorities (Gkarane et al., 2025).

Despite the rapid expansion of smart tourism research, its intersection with sport event management remains insufficiently theorized. Much of the existing work on technology in tourism focuses on digital marketing strategies, online review systems, or platform-based economies (Xiang et al., 2015), while event studies tend to prioritize economic impact assessment, visitor motivation, or legacy planning. The incorporation of data-driven systems into sport event governance, particularly at the local level, has not received comparable conceptual attention, and this gap becomes more visible when governance is considered as a central variable in sustainable development. Governance literature emphasizes that events must be strategically leveraged in order to transform temporary activities into long-term community benefits (Chalip, 2004), and Getz (2008) similarly stresses that event tourism should be embedded within broader destination management systems rather than treated as isolated projects. From a sustainability perspective, governance entails coordination among public authorities, private enterprises, community organizations, and residents (Bramwell & Lane, 2007), yet fragmented governance structures often constrain the ability of events to generate meaningful legacy effects.

In a digitally transforming environment, governance also encompasses the management of data flows, transparency mechanisms, and technological infrastructure. Choi and Sirakaya (2006) demonstrate that stakeholder collaboration enhances legitimacy and local support for tourism initiatives, yet the potential role of digital tools in facilitating such collaboration remains underexplored. Technologies such as digital dashboards, participatory platforms, and real-time feedback systems may strengthen accountability and inclusivity, but their integration into sport event sustainability frameworks has rarely been examined in a systematic manner. Taken together, the literature reveals three relatively well-developed yet conceptually disconnected strands: sport tourism and local development, sustainable destination governance, and smart tourism technologies. Although each strand contributes important theoretical insights, their intersection remains fragmented, with technology frequently treated as an operational instrument aimed at marketing efficiency or visitor convenience rather than as a structural component of governance and sustainability systems. Consequently, digital applications are often implemented without alignment with long-term development objectives. This conceptual separation limits our understanding of how technology-driven sport events can be strategically embedded within local sustainable tourism systems. The present study responds to this gap by advancing a framework that links digital infrastructure, stakeholder governance, and sustainability outcomes within the context of sport events.

Despite the growing literature on sport tourism, smart destinations, and digital transformation, these research streams often remain analytically separated. Existing studies tend to examine sport events primarily from economic impact or destination branding perspectives, while digital technologies are frequently discussed in relation to marketing or visitor experience. However, limited attention has been paid to how technology-driven sport events can function as governance instruments within sustainable destination management systems. Addressing this gap, the present study proposes a conceptual framework that integrates digital infrastructure, governance coordination, and sustainability outcomes in the context of sport tourism development.

Conceptual Framework and Strategic Implications

The strategic integration of technology-driven sport events into local sustainable tourism development requires moving beyond a narrow understanding of digitalization as an operational tool. In much of the sport event literature, technology is often discussed primarily in relation to marketing efficiency, ticketing systems, or spectator engagement. However, digital platforms can also act as catalysts for sustainable digital ecosystems, moving beyond operational efficiency toward a structural transformation of tourism destinations (Achilleos et al., 2021). A more comprehensive perspective situates technology within the broader governance and sustainability architecture of destinations, where digital transformation becomes not merely a technical upgrade but an institutional shift in how events are conceived, implemented, and evaluated within local tourism ecosystems. This perspective aligns with smart tourism scholarship, which has demonstrated that destinations increasingly function as interconnected systems where digital infrastructure, public authorities, private stakeholders, and visitors interact through continuous data exchange (Gretzel et al., 2015). However, sport event management has only partially internalized this systemic logic, with events often planned as temporary occurrences rather than as strategic instruments embedded in long-term destination development. This study therefore argues that the real contribution of technology-driven sport events emerges only when digital infrastructure is deliberately aligned with governance coordination and sustainability objectives.

Digital systems provide destinations with unprecedented capacities for monitoring and adaptive management. Real-time data collection on visitor flows, mobility patterns, waste generation, and energy consumption allows organizers and local authorities to shift from reactive management toward evidence-based decision-making, thereby improving crowd safety, reducing environmental pressures, and optimizing spatial planning. Buhalis and Amaranggana (2014) emphasize that smart destinations rely on integrated data ecosystems capable of supporting both experiential enhancement and managerial optimization, and when such ecosystems are applied to sport events, their potential multiplies significantly. However, technological capacity alone does not produce sustainable outcomes. Without institutional integration, digital tools remain fragmented applications that fail to influence broader tourism policy or generate lasting structural change. This distinction between operational technology and strategic digital transformation lies at the heart of the proposed framework.

Governance therefore becomes central to strategic integration. Sustainable tourism research consistently underlines the importance of stakeholder coordination and collaborative planning (Bramwell & Lane, 2007), and sport events typically involve complex networks of actors including municipalities, tourism boards, sport federations, sponsors, and community organizations. Digital platforms can facilitate coordination by enhancing transparency, enabling shared access to data, and supporting participatory processes. Choi and Sirakaya (2006) note that community-based sustainability indicators strengthen legitimacy and long-term support for tourism initiatives, and in a digitally enabled context, these indicators can be monitored more systematically and communicated more openly to residents. Such transparency may reduce resistance to event hosting, foster a sense of collective ownership, and ensure that event-related decisions reflect community priorities rather than solely commercial interests. The governance dimension also encompasses the management of data flows, privacy protections, and ethical considerations that arise from increased digital monitoring.

The long-term value of integrating technology into sport events ultimately lies in its contribution to sustainable development and legacy formation. Preuss (2007) conceptualizes event legacy as the lasting economic, social, and infrastructural outcomes that remain after an event concludes, and in technology-driven contexts, legacy extends to digital capacity building, data literacy within local institutions, and the establishment of monitoring systems that persist beyond the event itself. Digital capacity can be understood across three interrelated dimensions: technical infrastructure comprising sensors, networks, and platforms; human capital including digital literacy and specialized expertise; and institutional capacity encompassing data management policies, regulatory frameworks, and organizational procedures. Rather than producing short-lived economic boosts, strategically integrated events can strengthen adaptive capacity within local tourism systems, making environmental management more measurable, social inclusion more accessible through digital communication channels, and economic benefits more effectively distributed through data-informed local business strategies.

Smart destinations now rely on integrated data portals and participatory feedback applications to reduce informational asymmetries between authorities and residents (Van Rheenen et al., 2021; Malchrowicz-Mośko & Poczta, 2018). It must be acknowledged, however, that digital integration carries potential risks and limitations. Data privacy concerns, digital divides between different community segments, and the danger of over-prioritizing technological solutions at the expense of authentic local experiences all warrant careful consideration. Expanding on these risks, recent research highlights that the growing reliance on digital infrastructures may expose tourism destinations to cybersecurity vulnerabilities and governance challenges (Rossini et al., 2024; Yang, 2020). In addition, a lack of digital literacy among local stakeholders can lead to forms of information asymmetry that marginalize certain community groups within digitally mediated tourism systems (Liang et al., 2021). Smaller destinations with limited resources may face particular challenges in implementing sophisticated digital systems, suggesting the need for scalable and context-sensitive solutions that can be adapted to local capacities. These considerations reinforce the central argument that technology should not be positioned as an independent driver of development. Its transformative potential depends on deliberate alignment with institutional coordination, sustainability goals, and contextual sensitivity. Sport events, when strategically embedded within destination policy frameworks, may serve as experimental spaces where digital innovation, stakeholder governance, and sustainability practices converge. In this respect, technology-driven sport events function not only as attractions but as governance laboratories that contribute to the long-term resilience of local tourism systems. The digital footprint of sport events provides a longitudinal basis for evaluating environmental and social legacies in regional development (McKay et al., 2019). The relationships between these dimensions are summarized in the conceptual framework presented in Figure 1.

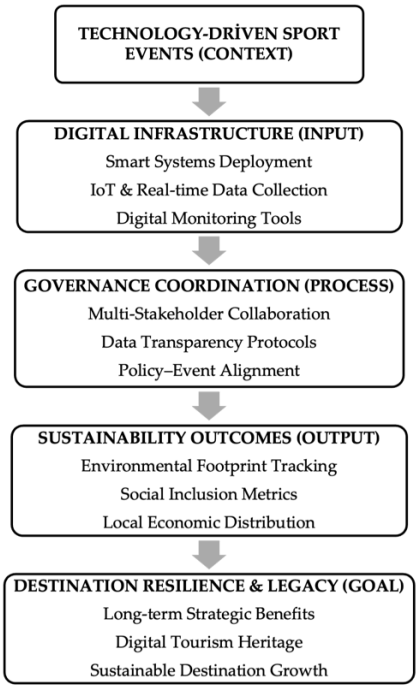

Figure 1. Strategic Integration Framework for Technology-Driven Sport Events in Sustainable Tourism Development

Figure 1 illustrates the conceptual framework proposed in this study. The model conceptualizes technology-driven sport events as a multi-stage process in which digital infrastructure serves as the foundational input that enables governance coordination among stakeholders. This coordination facilitates measurable sustainability outcomes related to environmental management, social inclusion, and local economic benefits. Over time, these outcomes contribute to long-term destination resilience and legacy formation within local tourism systems.

Case Study: Digital Integration and Sustainability in the Barcelona Marathon

The proposed strategic integration framework can be observed through the digital transformation of the Barcelona Marathon (Marató de Barcelona). In alignment with the Digital Infrastructure stage of our model, the event utilizes advanced IoT-based real-time tracking for participants and smart sensor networks across the city to monitor crowd density and traffic flow during the race. Such technological infrastructures increasingly support the operational management of large-scale running events, which require complex coordination between multiple stakeholders and urban services (García-Vallejo et al., 2020). This technical layer feeds directly into Governance Coordination, as the data collected is shared via a transparent digital portal accessible to the Barcelona City Council, local transportation authorities, and emergency services, allowing for synchronized decision-making and minimized urban disruption. Effective coordination between public institutions and event organizers is widely recognized as a critical component in the successful management of marathon events (García-Vallejo et al., 2020).

In terms of Sustainability Outcomes, the event leverages technology to track its environmental footprint, including real-time waste management and water consumption metrics. Social inclusion is promoted through a dedicated mobile platform that provides accessible information to diverse participant groups and local residents, reducing the "information asymmetry" often associated with large urban events.

Ultimately, these digital capabilities contribute to Destination Resilience by providing a longitudinal dataset that informs the city's long-term sustainable tourism policies and enhances its reputation as a leading smart sport tourism destination. This practical application demonstrates how technology can act as a catalyst for structural transformation rather than remaining merely an operational tool (Rossini et al., 2024; Gkarane et al., 2025).

Discussion

The conceptual framework proposed in this study suggests that the transformative potential of technology-driven sport events lies not in technological sophistication alone, but in the degree of strategic alignment between digital infrastructure, governance coordination, and sustainability objectives. This argument challenges a prevalent tendency in both sport event management and tourism studies to treat digital tools as neutral enhancers of efficiency. While efficiency gains are undeniable, particularly in areas such as crowd management, marketing analytics, and operational logistics, their developmental significance depends on institutional embedding. Existing sport tourism literature has consistently emphasized economic leverage and destination branding as primary rationales for event hosting, with Chalip (2004) highlighting the necessity of leveraging strategies to translate event-related visibility into broader community benefits. However, traditional leveraging has focused on promotional campaigns, business networking, and tourism packaging, whereas the integration of digital systems introduces a qualitatively different dimension. Data infrastructures, when embedded in local governance structures, may enable continuous monitoring of environmental performance, visitor distribution, and social impacts, thereby shifting the temporal horizon of event evaluation from short-term impact assessment to longer-term adaptive management.

Similarly, sustainable tourism research underscores the importance of stakeholder collaboration and institutional coherence (Bramwell & Lane, 2007), yet coordination mechanisms are often described in normative terms without specifying the operational tools that facilitate cooperation. Digital platforms can function as connective infrastructure within governance networks, with shared data portals, participatory feedback applications, and transparency dashboards reducing informational asymmetries between public authorities, private operators, and residents. In this respect, technology becomes an enabler of collaborative governance rather than merely a marketing instrument. However, the discussion also reveals significant tensions that must be acknowledged. Digital transformation may reinforce inequalities if access to technological resources is unevenly distributed, as smaller municipalities or community-based organizations may lack the technical expertise or financial capacity to implement advanced systems. Moreover, data governance raises concerns related to privacy, ownership, and accountability. Smart tourism ecosystems, as described by Gretzel et al. (2015), depend on continuous data flows, yet without clear regulatory frameworks, such flows may generate distrust among residents and stakeholders. Therefore, strategic integration requires not only technological adoption but also ethical and institutional safeguards.

Another important implication concerns legacy formation. Preuss (2007) conceptualizes legacy as the enduring outcomes of sport events beyond their immediate occurrence, and in digitally integrated contexts, legacy extends to intangible capacities such as digital literacy within local administrations, improved monitoring systems, and

institutional learning processes. Rather than investing exclusively in physical infrastructure, destinations may derive long-term value from knowledge accumulation and data-driven governance practices. This perspective broadens the understanding of legacy from tangible assets to adaptive capability, suggesting that the most enduring outcomes of technology-driven sport events may be institutional rather than infrastructural. From a recreation management standpoint, this carries additional disciplinary implications. Recreation management traditionally focuses on participant experience, resource allocation, and community well-being within leisure systems, and the integration of digital technologies into sport events intersects directly with these concerns. Technology-mediated engagement tools may enhance participant satisfaction, while environmental monitoring systems contribute to responsible resource use. However, maintaining authenticity and community character remains essential, as excessive technologization risks commodifying recreational experiences or marginalizing local cultural expressions. Strategic integration must therefore balance innovation with contextual sensitivity.

Overall, the discussion reinforces the central claim that technology-driven sport events should be conceptualized as governance instruments embedded within sustainable tourism strategies. Their developmental contribution depends on structural alignment rather than technological novelty. By situating digital transformation within the broader institutional and sustainability landscape, this study advances a more holistic understanding of how sport events can support resilient local tourism systems. The findings suggest that destinations which successfully integrate digital infrastructure with governance coordination and sustainability objectives can transform sport events from episodic attractions into enduring instruments of adaptive capacity and community resilience.

Conclusions and Recommendations

This study set out to address a conceptual gap at the intersection of sport tourism, sustainable destination governance, and digital transformation. While each of these domains has generated substantial scholarly attention, their integration has remained theoretically fragmented. The framework advanced in this article argues that technology-driven sport events should not be reduced to operational innovations or marketing enhancements. Rather, they should be understood as governance instruments that can be strategically embedded within local sustainable tourism systems. The central contribution of this study lies in reframing digital transformation as a structural component of event governance, situating digital infrastructure within a broader alignment process that connects stakeholder coordination, environmental monitoring, and long-term developmental objectives. In doing so, the study extends sport event literature beyond traditional impact analysis and short-term leveraging strategies while contributing to smart tourism research by grounding digital ecosystems within concrete event-based governance contexts. By incorporating the Barcelona Marathon as a case study, this research moves beyond purely conceptual speculation to provide evidence-based insights into how digital infrastructures can be operationalized to achieve long-term sustainability goals. From a policy standpoint, several implications emerge for different stakeholder groups.

First, local governments and destination management organizations should approach sport events as experimental platforms for testing digital governance mechanisms. Rather than investing solely in promotional technologies, public authorities may prioritize systems that support environmental monitoring, participatory decision-making, and transparent reporting. Real-time data collection on visitor mobility, resource consumption, and community feedback can inform adaptive management strategies that extend beyond the event period, creating lasting value for host communities. Second, stakeholder integration should be institutionalized through shared digital platforms. Collaborative data portals and participatory feedback systems may reduce fragmentation between public authorities, sport federations, tourism businesses, and local communities, thereby enhancing legitimacy and building long-term support for event hosting. However, technological implementation must be accompanied by clear regulatory frameworks that address data governance, privacy, and accountability concerns to prevent distrust and ensure equitable access. Third, smaller-scale and recurring sport events deserve particular attention within sustainable tourism policy. Compared to mega-events, they often align more closely with local identity and community capacity, and when supported by appropriate digital infrastructure, these events may strengthen local adaptive capability without imposing excessive financial or environmental burdens. Policymakers should therefore consider how digital transformation strategies can be scaled according to destination size and institutional capacity.

Despite its conceptual contributions, this study has limitations that suggest directions for future research. As a theoretical exploration, it does not provide empirical validation of the proposed framework, and future studies may

test the model through comparative case studies, longitudinal analyses of event-hosting destinations, or mixed-method investigations that integrate quantitative sustainability indicators with qualitative stakeholder perspectives. Empirical examination would help clarify the causal mechanisms through which digital integration influences governance effectiveness and sustainable development outcomes. In addition, further research may explore contextual variations, as the capacity to implement technology-driven governance structures may differ significantly between developed and developing destinations, as well as between metropolitan and rural contexts. Comparative studies could illuminate how institutional capacity, digital literacy, and regulatory environments shape the effectiveness of strategic integration.

In conclusion, technology-driven sport events hold considerable potential to contribute to local sustainable tourism development, yet this potential is not inherent in technological adoption itself. It depends on deliberate alignment between digital infrastructure, stakeholder governance, and long-term sustainability goals. When embedded within coherent policy frameworks, sport events can evolve from temporary attractions into instruments of adaptive governance and destination resilience, serving not only as platforms for athletic competition but as catalysts for institutional learning, community engagement, and sustainable transformation.

Ethical Statement

The writing process of the study titled "Strategic Integration of Technology-Driven Sport Events into Local Sustainable Tourism Development" adhered to scientific rules, ethical and citation rules; no alterations were made to the collected data, and this study has not been submitted for evaluation to any other academic publication medium.

Notes

This manuscript used Editly and Grammarly for translation support from Turkish to English and for language editing to enhance grammatical accuracy and readability. All AI-assisted content was thoroughly reviewed, verified, and edited by the author, who assumes full responsibility for the final version and its scientific integrity.

References

Achilleos, A., Makrominas, M., Markides, C., Alexandrou, R., Konstantinidis, A., Papacosta, E., Constantinides, P., Zikouli, E., & Tselepos, L. (2021). Promoting active sports tourism through technology and evaluating its economic impact: Experiences from Cyprus. *Journal of Sport & Tourism, 25*(4), 297–315. https://doi.org/10.1080/14775085.2021.1965009

Bramwell, B., & Lane, B. (2007). Interpretation and sustainable tourism: The potential and the pitfalls. *Journal of Sustainable Tourism, 15*(1), 1–3.

Buhalis, D., & Amaranggana, A. (2014). Smart tourism destinations. In Z. Xiang & I. Tussyadiah (Eds.), *Information and communication technologies in tourism 2014* (pp. 553–564). Springer. https://doi.org/10.1007/978-3-319-03973-2_40

Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet. *Tourism Management, 29*(4), 609–623. https://doi.org/10.1016/j.tourman.2008.01.005

Butler, R. W. (1999). Sustainable tourism: A state-of-the-art review. *Tourism Geographies, 1*(1), 7–25. https://doi.org/10.1080/14616689908721291

Chalip, L. (2004). Beyond impact: A general model for sport event leverage. In B. W. Ritchie & D. Adair (Eds.), *Sport tourism: Interrelationships, impacts and issues* (pp. 226–252). Channel View Publications.

Choi, H. C., & Sirakaya, E. (2006). Sustainability indicators for managing community tourism. *Tourism Management, 27*(6), 1274–1289. https://doi.org/10.1016/j.tourman.2005.05.018

Csobán, K. (2022). Technological innovations in event sport tourism: Case study of the 2021 Sabre World Cup in Budapest in Hungary. In *Digital transformation and innovation in tourism events* (1st ed.). Routledge. https://doi.org/10.4324/9781003271147

García-Vallejo, A. M., Albahari, A., Añó-Sanz, V., & Garrido-Moreno, A. (2020). What's behind a marathon? Process management in sports running events. *Sustainability, 12*(15), 6000. https://doi.org/10.3390/su12156000

Getz, D. (2008). Event tourism: Definition, evolution, and research. *Tourism Management, 29*(3), 403–428. https://doi.org/10.1016/j.tourman.2007.07.017

Gibson, H. J. (1998). Sport tourism: A critical analysis of research. *Sport Management Review, 1*(1), 45–76. https://doi.org/10.1016/S1441-3523(99)70096-8

Gkarane, S., Kavoura, A., Vassiliadis, C., Kotzaivazoglou, I., Fragidis, G., & Vrana, V. (2025). The role of organizers in advancing sustainable sport tourism: Insights from small-scale running events in Greece. *Sustainability, 17*(14), 6399. https://doi.org/10.3390/su17146399

Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets, 25*(3), 179–188. https://doi.org/10.1007/s12525-015-0196-8

Higham, J. (1999). Sport as an avenue of tourism development: An analysis of the positive and negative impacts of sport tourism. *Current Issues in Tourism, 2*(1), 82–90. https://doi.org/10.1080/13683509908667845

Higham, J., & Hinch, T. (2009). *Sport and tourism: Globalization, mobility and identity*. Butterworth-Heinemann.

Liang, F., Mu, L., Wang, D., & Kim, B. (2021). A new model path for the development of smart leisure sports tourism industry based on 5G technology. *IET Communications, 16*(5), 485–496. https://doi.org/10.1049/cmu2.12271

Malchrowicz-Mośko, E., & Poczta, J. (2018). A small-scale event and a big impact—Is this relationship possible in the world of sport? The meaning of heritage sporting events for sustainable development of tourism—Experiences from Poland. *Sustainability, 10*(11), 4289. https://doi.org/10.3390/su10114289

McKay, T., McEwan, L., & Baker, M. (2019). The rise of trail running in South Africa: Possibilities for small-scale sports tourism. *GeoJournal of Tourism and Geosites, 26*(3), 930–942. https://doi.org/10.30892/gtg.26320-408

Preuss, H. (2007). The conceptualisation and measurement of mega sport event legacies. *Journal of Sport & Tourism, 12*(3–4), 207–228. https://doi.org/10.1080/14775080701736957

Rossini, L., Falese, L., Andrade, A., & Federici, D. (2024). Exploring the socio-economic impact of small and medium-sized sports events on participants, tourism and local communities: A systematic review of the literature. *Journal of Sport & Tourism, 28*(4), 197–220. https://doi.org/10.1080/14775085.2024.2448940

Van Rheenen, D., Sobry, C., & Melo, R. (2021). Running tourism and the global rise of small scale sport tourism events. In *Sports economics, management and policy* (pp. 1–17). https://doi.org/10.1007/978-3-030-62919-9_1

Yang, Y. (2020). Research on the influence of large-scale sports events on the development of urban sports tourism industry based on the analysis of computer network technology. *Journal of Physics: Conference Series, 1574*(1), 012058. https://doi.org/10.1088/1742-6596/1574/1/012058

Xiang, Z., Magnini, V. P., & Fesenmaier, D. R. (2015). Information technology and consumer behavior in travel and tourism: Insights from travel planning using the Internet. *Journal of Travel Research, 54*(4), 511–527. https://doi.org/10.1177/0047287514528283