DIGITAL TECHNOLOGIES IN TOURISM CLUSTER MANAGEMENT

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Abstract. Digital technologies are reshaping tourism cluster management by changing how destinations coordinate firms, share information, market offerings, and respond to disruption. Recent research shows that digital transformation in tourism is no longer limited to websites and booking platforms; it now includes data-driven governance, smart destination systems, immersive experience design, and digitally enabled collaboration among destination stakeholders (Bekele & Raj, 2024; El Archi et al., 2023; Wu et al., 2024). This article synthesizes recent peer-reviewed studies to examine how digital tools influence the management of tourism clusters, understood as interconnected networks of tourism businesses, public agencies, and community actors. The review indicates that effective digital cluster management depends on three capabilities: platform-based collaboration, smart governance led by DMOs or micro-DMOs, and the strategic use of technologies such as AI, IoT, AR/VR, and data analytics. The evidence also suggests that digital technologies improve service coordination and resilience, but only when supported by trust, leadership, and interoperable systems. The article concludes that tourism clusters should treat digitalization as an organizational capability rather than a technical upgrade.

Keywords: tourism clusters, digital transformation, smart destination management, DMOs, digital collaboration, immersive technologies.

Introduction. Tourism clusters operate through dense interdependence: hotels, transport providers, attractions, restaurants, local governments, and destination organizations must coordinate resources and messages if the destination is to remain competitive. In the digital era, that coordination is increasingly mediated by platforms, shared data, and intelligent systems. The literature shows that digitalization in tourism has progressed from basic ICT adoption to broader transformation affecting competitiveness, sustainability, and destination governance (Bekele & Raj, 2024; Rodrigues et al., 2024; Wu et al., 2024). This shift matters because tourism clusters are weak when actors work in isolation and strong when they share information and align decisions. Digital technologies now influence how cluster managers handle marketing, visitor experience, knowledge exchange, and crisis response. Smart destination research emphasizes that technology should support not only tourists but also residents, local firms, and governance bodies (Sorokina et al., 2022; Wei et al., 2024). In this sense, cluster management is no longer just about promotion; it is about orchestrating a digital ecosystem that can sense demand, coordinate supply, and adapt quickly.

Literature Review. Recent scholarship identifies several recurring themes. First, digital technologies are increasingly viewed as strategic infrastructure for sustainable tourism destinations. El Archi et al. (2023) show that digital tools support destination sustainability through better information flows, visitor management, and stakeholder coordination. Wu et al. (2024) similarly argue that digital tourism and smart development are linked to improved management, more personalized experiences, and stronger integration across destination systems.

Second, the literature stresses the importance of governance. Sorokina et al. (2022) propose a smart destination framework centered on IT, e-governance, sustainability, and livability, while Mandić and Kennell (2021) show that smart governance in heritage destinations must be context-specific rather than copied mechanically across places.

Gretzel (2022) argues that destination management organizations require new functions such as sensing, mobilizing, match-making, and stewardship in order to govern smart destinations effectively. These studies imply that digital tools only create value when embedded in an institutional structure capable of coordination.

Third, digital collaboration has become central to destination management platforms. Zainal-Abidin et al. (2023) show that DMOs can use digital platforms to enable collaboration among business stakeholders through trust, mutuality, control, and leadership, with knowledge sharing and networking as key functions. This is directly relevant to tourism cluster management because clusters depend on exactly these forms of inter-firm cooperation.

Fourth, the technology stack itself is expanding. Systematic reviews show the importance of immersive technologies such as VR and AR in tourism experience design, while industry 4.0 research highlights the role of digital competencies, customer-facing tools, and supply-chain connectivity (Pratisto et al., 2022; Rodrigues et al., 2024). Together, these studies suggest that cluster management must increasingly integrate experience design with back-end coordination.

Methodology. This article uses an integrative literature review of peer-reviewed studies published mainly after 2018. The selected works focus on digital transformation, smart destinations, digital collaboration, governance, and immersive technologies in tourism. The purpose is to synthesize the literature into a cluster-management perspective rather than to test a statistical hypothesis. The analysis groups the evidence into four themes: governance, collaboration, experience design, and resilience.

Analysis and results. The review points to four practical results. First, digital technologies improve cluster coordination when they are used as shared infrastructure rather than isolated tools. The study by Ku (2025) shows that digital technologies collaboration and technological capabilities strengthen virtual integration and customer

service capabilities, which in turn improve tourism product advantage and supply-chain resilience. For cluster management, this means that booking systems, customer communication, and partner data must be interoperable; otherwise, the cluster remains fragmented. Second, smart governance is a leadership problem as much as a technical one. Sorokina et al. (2022) identify the role of DMO leadership in facilitating the transition to smart destinations, and Mandić and Kennell (2021) caution that governance models must fit the local context. The implication is simple: digital cluster management fails when a destination buys technology without redesigning authority, roles, and decision rights. DMOs and micro-DMOs must act as coordinators, not just marketers.

Third, digital collaboration depends on trust and stakeholder participation. Zainal-Abidin et al. (2023) show that successful digital collaboration on a DMO platform relies on mutuality, trust, control, and leadership, and that digital platforms should support marketing, networking, and knowledge sharing. In tourism clusters, this means the platform must be designed for firms, not merely for tourists. A cluster that lacks a shared digital workspace will struggle to coordinate campaigns, respond to shocks, or exploit cross-selling opportunities. Fourth, visitor-facing technologies matter because they shape the value proposition of the whole cluster. Pratisto et al. (2022) show that immersive technologies are increasingly used to enrich tourism experiences, while Wei et al. (2024) demonstrate that smart tourism destinations can influence residents' overall life satisfaction. This is important because cluster competitiveness now depends on both visitor satisfaction and local acceptance. A tourism cluster that irritates residents or ignores community benefits is strategically unstable, no matter how advanced its app or AI system may be. Overall, the evidence suggests that digital technologies create value in tourism clusters through three mechanisms: integration, intelligence, and interaction. Integration links firms and institutions through shared systems. Intelligence improves sensing, prediction, and decision-making. Interaction enhances visitor experience and

stakeholder engagement. Where these mechanisms are absent, digitalization becomes superficial branding rather than real management capability.

Conclusion and Recommendations. Digital technologies are now a core part of tourism cluster management, not an optional add-on. The literature shows that smart destination governance, collaborative digital platforms, and immersive technologies can strengthen competitiveness, resilience, and sustainability when they are aligned with institutional leadership and stakeholder trust. The main mistake is to treat digitalization as software purchase. It is a management redesign problem. Tourism clusters should therefore invest in interoperable data systems, define clear governance roles for DMOs and micro-DMOs, and build digital collaboration routines with businesses and public agencies. They should also use AR/VR, AI, and analytics selectively, focusing on visitor value, resident wellbeing, and operational coordination rather than technology for its own sake. Finally, cluster managers should treat digital capability as a long-term strategic asset that must be trained, governed, and continuously reviewed.

References:

1.Bekele, H., & Raj, S. (2024). Digitalization and digital transformation in the tourism industry: A bibliometric review and research agenda. Tourism Review, 80(4), 894–913. https://doi.org/10.1108/TR-07-2023-0509

2.El Archi, Y., Benbba, B., Kabil, M., & Dávid, L. D. (2023). Digital technologies for sustainable tourism destinations: State of the art and research agenda. Administrative Sciences, 13(8), 184. https://doi.org/10.3390/admsci13080184

3.Gretzel, U. (2022). The Smart DMO: A new step in the digital transformation of destination management organizations. European Journal of Tourism Research, 30, 3002. https://doi.org/10.54055/ejtr.v30i.2589

4.Ku, E. C. (2025). Tourism digital transformation and future supply chain competition: An integrated perspective on real options theory and digital competencies.

Journal of Tourism Futures, 11(2), 240–260. https://doi.org/10.1108/JTF-10-2023-0232

5.Mandić, A., & Kennell, J. (2021). Smart governance for heritage tourism destinations: Contextual factors and destination management organization perspectives. Tourism Management Perspectives, 39, 100862. https://doi.org/10.1016/j.tmp.2021.100862

6.Pratisto, E. H., Thompson, N., & Potdar, V. (2022). Immersive technologies for tourism: A systematic review. Information Technology & Tourism, 24(2), 181–219. https://doi.org/10.1007/s40558-022-00228-7

7.Rodrigues, V., Breda, Z., & Rodrigues, C. (2024). The implications of industry 4.0 for the tourism sector: A systematic literature review. Heliyon, 10(11), e31590. https://doi.org/10.1016/j.heliyon.2024.e31590

8.Sorokina, E., Wang, Y., Fyall, A., Lugosi, P., Torres, E., & Jung, T. (2022). Constructing a smart destination framework: A destination marketing organization perspective. Journal of Destination Marketing & Management, 23, 100688. https://doi.org/10.1016/j.jdmm.2021.100688

9.Wei, W., Önder, I., & Uysal, M. (2024). Smart tourism destination (STD): Developing and validating an impact scale using residents' overall life satisfaction. Current Issues in Tourism, 27(17), 2849–2872.

https://doi.org/10.1080/13683500.2023.2296587

10.Wu, W., Xu, C., Zhao, M., Li, X., & Law, R. (2024). Digital tourism and smart development: State-of-the-art review. Sustainability, 16(23), 10382. https://doi.org/10.3390/su162310382

11.Zainal-Abidin, H., Scarles, C., & Lundberg, C. (2023). The antecedents of digital collaboration through an enhanced digital platform for destination management: A micro-DMO perspective. Tourism Management, 96, 104691. https://doi.org/10.1016/j.tourman.2022.104691